Media Coverage and Investors' Attention to Earnings Announcements

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Abstract

We study whether investors' inattention contributes to the post-earnings announcement drift using media coverage to measure attention. We compare announcements made by the same firm in the same year and generating the same earnings surprise, when one announcement is covered in the *Wall Street Journal* while the other is not. Announcements with media coverage generate stronger price and trading volume reactions upon announcement and less subsequent drift. This effect is less pronounced for more visible firms and on high-distraction days. These results are both economically and statistically strong. Thus, limited attention is an important source of friction in financial markets.

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Underreaction to corporate events – defined as average post-event abnormal returns of the same sign as event-date returns – is a pervasive anomaly in financial markets. Prominent examples include dividend initiations and omissions, stock splits, earnings announcements, changes in analyst recommendations, tender offers and seasoned equity offerings.[1] Various explanations for the return drift following these events have been put forward, some risk-based and others behavioral. One explanation that has recently generated interest holds that it is caused by investors' lack of attention. If inattentive investors only gradually learn about an event – and if market frictions prevent attentive investors from arbitraging the mispricing away, then returns will display continuations.

Inattention is a simple and appealing explanation. It is an inexorable implication of our limited cognitive resources: we simply cannot process the many signals we receive, and need to focus on a selected few at the expense of the others. Recent theories flesh out the implications of these limitations, which range from mispricing to comovements in asset returns or in volatility.[2] Though these limitations seem obvious, evidence is still scarce on how inattention shapes investors' decisions and equilibrium outcomes.

In this paper, we assess empirically whether inattention leads investors to underreact to earnings news. Earnings announcements are particularly interesting for analyzing attention because they offer investors ample opportunity to react adequately. Not only are they highly relevant to firm valuation, they are also regular and often scheduled in advance. We use media coverage as a proxy for investors' attention, and measure it as the number of articles published about the announcing firm in the *Wall Street Journal* (WSJ) at the time of the announcement. Media coverage is naturally correlated with investors' attention

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[1] For dividend initiations and omissions, see Michaely (1995); for stock splits, see Ikenberry and Ramnath (2002); for earnings announcements, see Bernard and Thomas (1990); for changes in analyst recommendations, see Womack (1996) and Michaely and Womack (1999); for tender offers, see Ikenberry (1995); for seasoned equity offerings, see Loughran and Ritter (1995). Chan (2003) studies underreaction to public news about a firm, identified by the presence of a newswire or a press article.
[2] See for example Sims (2003), Hirshleifer and Teoh (2003), Peng (2005) and Peng and Xiong (2006).

while being independent of the trading process. We examine whether the post-earnings announcement drift is caused by (a lack of) media coverage.

The essence of our results is captured in Figure 1. The figure displays the evolution of the average cumulative abnormal return in event-time relative to the earnings announcement date for two pairs of announcements. Each pair consists of quarterly announcements made by the same firm in the same year and generating the same surprise (as measured by the gap between the median analyst forecast and reported earnings). One is covered in the WSJ (solid curves) while the other is not (dashed curves). Importantly, the matching procedure ensures that any effect we capture reflects the impact of media coverage rather than variations in firm characteristics. For example, market capitalization has an overwhelming impact on both media coverage and the post-earnings announcement drift. If we did not control for it, we could wrongly interpret a size effect as a media, i.e. attention, effect.[3]

The top two curves in Figure 1 refer to positive earnings surprises and the bottom two cures to negative surprises – again the magnitude of the surprise is similar within each pair of announcements. The plot clearly shows that announcements with more media coverage generate less post-earnings announcement drift – the solid lines are flatter than the dashed lines over the post-announcement window. Media coverage increases the 70-day cumulative abnormal return by 3.7% for announcements in the bottom surprise quintile (bad surprise) and decreases it by 3.4% for those in the top quintile (good surprise). The difference between these numbers (good news minus bad news) equals -7.5% and has a *t*-stat of -2.1. It reveals an economically and statistically strong effect of media coverage. Thus, announcements that attract more attention as proxied by their coverage in the WSJ are associated with significantly less drift.[4]

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[3] Covered firms tend to be large (Fang and Peress (2007)), and large firms tend to have less post-earnings drift (Bernard and Thomas (1989, 1990)). Other relevant characteristics include liquidity, the book-to-market ratio, analyst following, the fraction of individual ownership and the sector in which firms operate.

[4] Our analysis controls for the endogeneity of media coverage – media coverage tends to be larger for more surprising announcements. Indeed, we do not test whether announcements covered in the media trigger a

Moreover, the attention story predicts that the drift is reduced because attentive investors react more strongly to the earnings news at the time it is released. This is indeed what the picture shows. Announcements with more media coverage are associated with a stronger reaction over a 3-day window ranging from day 0 to day 2 (where the announcement is made on day 0). The economic magnitude of this effect is commensurate to that observed in the post-announcement period.[5] The 3-day cumulative abnormal return is lower by 1.3% for announcements in the bottom earnings surprise quintile and larger by 1.4% for those in the top quintile. We also examine the trading volume response to the announcement, and find that it is consistent with the attention story. We observe that trading intensifies by approximately 16% for both good and bad earnings surprises at the time of the announcement for announcements with media coverage. This finding provides some empirical grounding for the use of trading volume as a proxy for investor attention.[6]

Our results demonstrate that the market response to earnings announcement is related to investors' attention – as proxied by their coverage in the media. We should emphasize that, whether media draws attention to announcements or whether it simply proxies for attention – i.e. investors' attention is drawn to an announcement by an exogenous event that also catches the media's interest, does not alter our conclusion. Both interpretations, causality vs. correlation, are consistent with the notion that attention improves market efficiency by reducing underreaction to news.

We attempt next to identify characteristics of announcement days and announcing firms for which the effect of attention is the strongest. A regression analysis reveals that the effect of media coverage on

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stronger market response but whether, for these announcements, the *sensitivity* of the market reaction to earnings news is larger.

[5] This effect is statistically significant. The difference in the media effect across the two extreme surprise quintiles (good news – bad news) has a *t*-stat of 2.2.

[6] More precisely, we show that low trading volume signals that investors are inattentive. But we do not show the converse, that high trading volume implies that investors are attentive. For example, intense trading could be a sign of strong disagreement among few investors at a time when most investors are inattentive. Because of its availability, trading volume is often used to measure investors' attention (e.g. Gervais et al. (2001), Frazzini and Lamont (2006), Hou et al. (2006), Barber and Odean (2007)).

the drift is considerably weaker for more visible firms (firms with a high degree of investor recognition[7] and a low book-to-market ratio) and on high-distraction days (days with many firms in the media and Fridays). Moreover, the effect on trading volume is less pronounced for high-recognition stocks, for stocks operating in the tech sector (our sample period is marked by the technology boom and bust which drew investors' attention to technology firms) and on high-news days. These results lend support to the notion that inattention tones down investors' immediate reaction to earnings announcements and accentuates their delayed reaction. If investors are more distracted at certain times, such as when there are many firms in the news or when the weekend approaches, then the occurrence of WSJ articles will overestimate how much attention is really paid to announcements. Similarly, some firms such as firms with a strong investor recognition, or growth firms which have grown strongly in recent years may be repeatedly on investors' minds, so variations in media coverage overstate differences in attention to these firms. Such times and firms should therefore be associated with a weaker effect of media coverage, as we report. To summarize, we find that media coverage has less influence for more visible firms and on high-distraction days, in agreement with the attention hypothesis.

Finally, we find no evidence that attention varies across groups of investors, to the extent that we can accurately identify them. The impact of WSJ articles on returns and trading volume is independent of the proportion of individual investors holding the stock. Moreover, positive and negative announcements are associated with a similar media effect, suggesting that short-sales constraints are not binding. [8]

To conclude our analysis, we assess the economic importance of the attention effect by studying the profitability of a strategy that "sells the drift" when an earnings announcement receives attention and

[7] Merton (1987) argues that a stock's recognition among investors is captured by its shadow cost of incomplete information, which measures the excess risk that the stock imposes on its shareholders relative to a factor model, when they are not fully diversified. See Kadlec and McConnell (1994), Foerster and Karolyi (1999) and Chen, Noronha and Singal (2004) for empirical implementations.

8 Our sample consists of relatively large stocks. Barber and Odean (2007) argue that attention has a stronger effect on positive earnings surprises since it causes both short-sales constrained and unconstrained investors to buy, than on negative earnings surprises for which it induces unconstrained investors to sell and constrained investors to stay put or even to buy.

“buys the drift” when it does not. We form a high-attention portfolio that buy firms whose most recent announcement was in the top earnings surprise quintile and was covered in the WSJ, and sells short firms whose most recent announcement was in the bottom quintile and was covered in the WSJ. We form a low-attention portfolio in a similar fashion, except that we only use firms whose most recent announcement was not covered in the WSJ. A strategy that is long the low-attention portfolio and short the high-attention portfolio yields a sizeable risk-adjusted return of 9.1% per annum (statistically significant at the 1% level). We emphasize that our portfolio formation approach is implementable as it only makes use of data that is available on the formation date and of stocks that are relatively liquid and easy to short (our sample consists mostly of NYSE stocks with at least one analyst).

Our findings contribute to the recent but growing empirical literature on the role of attention in finance. It relates most closely to DellaVigna and Pollet (2006), Hirshleifer et al. (2006), Hou et al. (2006) and Lamont and Frazzini (2006) who also study investors’ response to earnings announcements using various proxies for attention. DellaVigna and Pollet (2006) report that the post-earnings announcement drift increases while the announcement-event return and trading volume decrease when the announcement is made on a Friday. Hirshleifer et al. (2006) find a similar pattern for announcements made on days when there are numerous earnings releases by other firms. Hou et al. (2006) show that earnings momentum is reduced for stocks with high past trading volume and in up markets. Lamont and Frazzini (2006) identify a set of stocks that tend to be mostly traded around earnings announcements, and show that they have positive abnormal returns and small-investor buys around subsequent earnings announcements.

We contribute to this literature by providing consistent evidence based on a new proxy for attention – media coverage, that inattention is a significant cause of underreaction to news. An advantage of this proxy is that it is unrelated to the trading process – as in DellaVigna and Pollet (2006) and Hirshleifer et al. (2006), and allows to examine how both the price and volume reactions change with attention. A further contribution is to use a matching procedure that controls for a host of firm characteristics. Specifically, because we compare announcements made by the same firm in the same year, our procedure controls for *all* firm characteristics, including unobserved ones, that do not vary from one announcement to another within the year.[9] Other studies use media coverage as we do to proxy for attention, albeit not to analyze earnings announcements.[10] We add to these papers by presenting comprehensive evidence that media coverage influences the market's reaction to earnings announcements.

The balance of the paper is organized as follows. Section 1 reviews the related literature. Section 2 develops the test hypotheses and statistical methodology. Section 3 describes the data and variable definitions. The subsequent sections present the results. We start with a preliminary analysis that does not control for firm characteristics (Section 4) and then turn to a matching procedure that does (Section 5). We perform next a regression analysis to identify the circumstances under which attention effects are the strongest (Section 6). Finally, we study the profitability of a trading strategy based on our findings (Section 7). Section 8 concludes.

1. Related Literature

A growing strand of research studies the role of attention in economics.[11] On the theory side, models have been developed to flesh out its implications. For example, Sims (2003) studies its effect on price and consumption dynamics, and Mankiw and Reis (2002) and Woodford (2002) on monetary transmission mechanisms. Hirshleifer and Teoh (2003) examine the influence of attention on firms' accounting disclosure policies, and Peng (2005) and Peng and Xiong (2006) on the correlations in stock return. Hong and Stein (1999) assume that private information diffuses gradually across a population of "newswatchers" to explain short run underreaction and long run reversals. Gabaix and Laibson (2003) and Gabaix et al. (2006) present and test in an experimental setting a tractable model of attention allocation.

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[9] DellaVigna and Pollet (2006) and Hirshleifer et al. (2006) control for an explicit list of firm characteristics by including them as explanatory variables in their regression analysis.
[10] See for example Klibanoff, Lamont and Wizman (1998), Huberman and Regev (2001) , Nofsinger (2001), Meschke (2002). These papers are reviewed in Section 1.
[11] See DellaVigna (2008) for more evidence. See Hirshleifer et al. (2006) for a review of the psychological literature on attention.

Empirically, attention has been shown to influence a number of trade and return patterns. These include momentum and reversals in stock returns (Hou et al. (2006)), the gradual diffusion of information across stocks or sectors (Hong, Torous and Valkanov (2005), Hou and Moskowitz (2005), Cohen and Frazzini (2006)), investors' propensity to trade (Barber and Odean (2007)), and the premium associated with extreme trading activity (Gervais et al. (2001)).

Our paper is most closely related to studies of investors' attention to earnings announcements. DellaVigna and Pollet (2006) report that the post-earnings announcement drift increases while the announcement-event return and trading volume decrease when the announcement is made on a Friday. They also show that managers take advantage of investors' distraction by releasing worse news on Fridays. Hirshleifer et al. (2006) find a similar return and volume pattern for announcements made on days when there are numerous news releases by other firms. They further show that the pattern is reversed if competing announcements are made by firms operating in the same industry as the announcing firm, indicating that these related announcements attract rather than distract attention to the announcing firm. Hou et al. (2006) find that earnings momentum is reduced for stocks with high trading volume and in up markets, which proxy for attention – they argue that investors are more attentive in up markets and increased attention leads to more trading. In contrast to earnings momentum profits, they find that price momentum profits reverse in the long run, and increase with trading volume. This indicates that enhanced attention can also induce some overreaction. Lamont and Frazzini (2006) show that abnormal returns are on average positive around earnings announcements, regardless of whether the news is good or bad. They document a related surge in trading volume and in small-investor buys. Moreover, these features are particularly pronounced for firms which tend to see most of their trading concentrated around earnings announcements. Together, these results are consistent with small, short-sale constrained investors buying stocks which attract their attention via an earnings announcement.

Several studies use media coverage as a proxy for attention, albeit not to study earnings announcements.[12] In an interesting case in point, Huberman and Regev (2001) report that in 1998 an article in the *Sunday New York Times* on a new drug triggered a large market reaction though the news had already been reported in the journal *Nature* and various popular newspapers several months ago. Klibanoff, Lamont and Wizman (1998) measure the elasticity of closed-end country fund prices to asset value. They document that its magnitude is larger and closer to one when country news appears on the front page of *The New York Times*. Meschke (2002) analyzes price and volume reactions to CEO interviews broadcast on CNBC. He documents positive abnormal returns and trading volume before and during the interview though it does not convey any new information. Barber and Odean (2007) show that individual investors are net buyers of stocks mentioned on the *Dow Jones* newswire, whether the news is good or bad. They show further that these stocks underperform, suggesting that individuals inflated prices. Nofsinger (2001) compares the trading behavior of institutional and individual investors around news releases in the *Wall Street Journal*. He finds that longer articles induce individuals, but not institutions, to trade more.

2. Methodology

We describe in turn the test hypotheses, the estimation procedure and the data.

2.1. Hypothesis development

We state our main hypotheses and then flesh out their implications for specific groups of investors, days and types of firms.

2.1.1 Main hypotheses

We postulate that the coverage of earnings announcements in the media is positively correlated to the attention they attract from investors. This leads to the following testable hypotheses.

[12] An exception is Tetlock et al. (2007) who study the linguistic content of *Wall Street Journal* and *Dow Jones News Service* stories about S&P500 firms building on Tetlock (2007). They show that it can predict earnings and stock returns.

Hypothesis 1: The sensitivity of announcement abnormal returns to earnings surprises rises with media coverage.

Hypothesis 2: The sensitivity of post-announcement abnormal returns to earnings surprises declines with media coverage.

Hypothesis 3: The sensitivity of abnormal trading volume to earnings surprises at the announcement rises with media coverage.

Under hypotheses 1 and 3, announcements that draw more attention as proxied by their coverage in the media, generate a stronger immediate reaction in the market both in terms of returns and volume. Hypothesis 2 states that these stronger immediate reactions lead to less drift over the subsequent period.

Of course, media coverage is not exogenous – it tends to be larger for more newsworthy or surprising announcements. So announcements with media coverage are naturally associated with a stronger market reaction, both at the time of the announcement and over the subsequent period. For this reason, we control for the importance of earnings surprises throughout our analysis. That is, we do not test whether announcements covered in the media trigger a stronger market response. Rather, we test whether, for these announcements, the *sensitivity* of the market reaction to earnings news is larger.

Moreover, supposing we did not control for the importance of the surprise, a positive correlation between media coverage and the importance of the surprise, while consistent with hypotheses 1 and 3, would lead to a rejection of hypothesis 2. Indeed, bigger surprises generate *more* drift, not less (Bernard and Thomas (1989)), so announcements covered in the media, in the absence of any other effect, would be followed by more drift, not less.

If hypotheses 1 to 3 are not rejected, then we attempt to identify the conditions under which attention has the strongest influence. Specifically, we examine whether the attention effect is more pronounced for specific groups of investors (hypotheses 4 and 5 pertaining to sophisticated vs. unsophisticated investors), on particular days (hypothesis 6 on high- vs. low- distraction days) and for certain types of firms (hypothesis 7 on firm visibility).

2.1.2 Attention and investor types

It is plausible that attention is more limited for individual investors than for professional investors such as institutions (Barber and Odean (2007))[13]. If this is the case, then variations in attention will have a stronger impact on the trading behavior of individuals and on the stocks they predominantly own. We assess this possibility using the fraction of individual ownership and formulate the following hypothesis.

> **Hypothesis 4a**: The effect of media coverage on announcement and post-announcement abnormal returns and on abnormal trading volume is stronger for firms with a higher fraction of individual ownership.

Alternatively, Bernard and Thomas (1990) suggest that the post-earnings announcement drift is caused by the contrarian trades of unsophisticated investors such as individuals. [14] If individuals sell (buy) in response to good (bad) earnings news, then they slow down its incorporation into stock prices, and induce a post-earnings announcement drift. Putting it differently, the drift is induced by individuals' "excessive attention", rather than their inattention. In this case, announcements that attract proportionally more institutional attention – for example because attention is scarcer for institutions than for individuals –

[13] Barber and Odean (2007) study how trades of individual and institutional investors respond to attention-grabbing events. They find that individual investors tend to be net buyers of stocks that are in the news, stocks experiencing high abnormal trading volume, and stocks with extreme one day returns.

[14] Bernard and Thomas (1990) conjecture that some investors use a naïve seasonal random walk model to predict earnings, i.e. extrapolate earnings from the same quarter in the previous year. The evidence on their conjecture is mixed. Potter (1992) documents that the return response to earnings announcements is dampened for firms held by fewer individuals but Bartov et al. (2000) find mixed results on the post-earnings announcement drift. Lee (1992), Bhattacharya (2001) and Battalio and Mendenhall (2005) find evidence that this is the case using trade size as a proxy for investor sophistication. But Hirshleifer et al. (2003), examining the actual trades of individuals at a large discount broker, find no such evidence. Vega (2006) uses a microstructure model to identify whether trades are initiated by informed or uninformed investors. She finds that the announcements for which the drift is the strongest are associated with arrival rate of uniformed traders.

are associated with less drift.[15] This would lead to the opposite of hypothesis 4a, as stated in the following hypothesis.

Hypothesis 4b: The effect of media coverage on announcement and post-announcement abnormal returns and on abnormal trading volume is stronger for firms with a lower fraction of individual ownership.

A rejection of hypotheses 4a and 4b could occur either because sophisticated and unsophisticated investors are equally attracted to announcements with high media coverage, or because the fraction of individual ownership is a poor proxy for sophistication.

Barber and Odean (2007) also develop a variant of these hypotheses for investors who do not sell short (whom we call "constrained"). [16] They argue that news that attracts their attention induces them to buy on average even if the news is bad, because only investors who own the stock actually sell it. In that case, attention should have a stronger effect on positive earnings surprises – since it causes both constrained and unconstrained investors to buy, than on negative earnings surprises – for which it induces unconstrained investors to sell and constrained investors to stay put or even to buy. [17] This notion is formalized in the next hypothesis.

Hypothesis 5: The effect of media coverage on announcement and post-announcement abnormal returns and on trading volume is stronger for positive earnings surprises than for negative earnings surprises.

[15] As an example of attention effects among professional traders, Corwin and Coughenour (2005) document that NYSE specialists' limited attention influences the execution quality of the stocks in which they make markets.

[16] Such constrained investors include some individuals and some institutions such as mutual funds which are not allowed to short.

[17] Such constrained investors may include some individuals and some institutions such as mutual funds which are not allowed to short. Hirshleifer et al. (2006) document that the number of competing earnings announcement has an effect for positive earnings surprise but not for negative surprises. They interpret this asymmetry as supportive of the Barber and Odean (2007) hypothesis. Hou, Peng and Xiong (2006) also find evidence of an asymmetric effect of attention.

2.1.3 Attention and distracting events

If investors are more distracted at certain times, such as when the weekend approaches or when there are many firms in the news, then the occurrence of WSJ articles may overestimate how much attention is really paid to announcements.[18] Such times should therefore be associated with a weaker effect of media coverage:

> **Hypothesis 6**: The effect of media coverage on announcement and post-announcement abnormal returns and on abnormal trading volume is stronger on low-distraction days.

2.1.4 Attention and firm visibility

Similarly, some firms may be constantly on investors' minds so media coverage does not really reflect attention to these firms. These include firms with a strong investor recognition, large firms, firms followed by many analysts, firms operating in the technology sector – our sample period covers the technology boom and bust when much attention was paid to technology firms, and growth firms – or "glamour" firms with a low book-to-market ratio. We expect the effect of media coverage again to be smaller for these highly visible firms. This leads to the following hypothesis.

> **Hypothesis 7**: The effect of media coverage on announcement and post-announcement abnormal returns and on abnormal trading volume is stronger for less visible firms.

We describe next the estimation procedure.

[18] DellaVigna and Pollet (2006) and Hirshleifer et al. (2006) show respectively that investors pay less attention to a firm's announcement on Fridays and when there are simultaneously numerous earnings releases by other firms.

2.2 Estimation procedure

We measure the sensitivity of abnormal returns and trading volume to earnings surprises, and examine how it is affected by media coverage. As a warm-up, we perform an unconditional analysis, i.e. we do not control for other possible determinants of this sensitivity. Specifically, we assign announcements to groups based on how surprising they are and on how much media attention they receive. Then we examine how the market's reaction – announcement and post-announcement abnormal returns and announcement abnormal trading volume – differs across media groups. Importantly, we check that within surprise groups, announcements are similar in terms of the magnitude of the surprise. If this were not the case, any difference between covered and non-covered announcements belonging to the same surprise group could result from differences in the size of the surprise rather than in attention.

While the unconditional analysis is informative, we cannot be sure that the effects we capture reflect the impact of media coverage rather than variations in some firm characteristics. For example, market capitalization has an overwhelming impact on both media coverage and the post-earnings announcement drift. It is well known that covered firms tend to be large and that large firms tend to have less post-earnings drift (Bernard and Thomas (1989)). So a potential media effect may in fact be a size effect in disguise. Other relevant characteristics include liquidity, the book-to-market ratio, analyst following, the fraction of individual ownership and the sector in which firms operate.[19] In the next step of our analysis, we employ a matching procedure to factor out firm characteristics.

Our strategy is to compare earnings announcements that are made by the same firm but that differ in the amount of media coverage they receive. We form pairs of announcements according to the following criteria:

[19] Bernard and Thomas (1989), Potter (1992), Bhushan (1994) and Vega (2006) show respectively that size, institutional ownership, liquidity and analyst following are drivers of the post-earnings announcement drift. Fang and Peress (2007) document that media coverage increases in size, liquidity and analyst following and decreases in individual ownership.

1. The announcements are made by the same firm in the same calendar year;
2. The announcements belong to the same surprise quintiles;
3. In each pair, one announcement is covered in the media while the other is not.

If we find more than two announcements satisfying these requirements (e.g. more than one announcement without media coverage), then we chose the announcements that are the closest in terms of the earnings surprise. Requirement 1 guarantees that the paired announcements correspond to the same firm. Since the longest time interval between matched announcements is three quarters, neither firm characteristics nor the market have time to change significantly. Requirement 2 ensures that the paired announcements are similar in surprise magnitude. Finally, requirement 3 introduces differences in media coverage across the paired announcements.

3. Data and Variable Definitions

We describe in turn how we measure media coverage, earnings surprises and abnormal returns and trading volume.

3.1 Media coverage

Our proxy for the amount of attention an earnings announcement attracts from investors is the number of articles published about the announcing firm in the *Wall Street Journal* (WSJ) at the time of the announcement. We choose the WSJ because it is a specialized financial daily newspaper with a broad coverage of the market and a wide circulation.[20] We obtain the data from LexisNexis, an online database.[21]

[20] The WSJ is the second most circulated daily paper in the U.S and the first financial paper. It is read by both professional individual investors. Its average weekday circulation is over 1.8 million copies in 2002 (excluding online subscriptions, data from the Audit Bureau of Circulations).

[21] LexisNexis uses an indexing technology to associate articles to company names. The list of company names, which includes all firms listed on the NYSE and NASDAQ exchanges, is obtained from LexisNexis and matched to the CRSP companies' names. The CRSP names differ slightly from the LexisNexis names because of abbreviations or special characters (such as spaces, -, ' or &). A computer program is used for matching, and the remaining names are matched manually.

Our initial sample of firms consists of all companies listed on the NYSE and 500 randomly selected companies listed on the NASDAQ between January 1, 1993 and December 31, 2002.[22]

Earnings announcements are usually reported in the WSJ on the following day. Figure 2 displays the fraction of firms featured in the WSJ in event time relative to their announcement date (day 0). The fraction increases nine fold to 0.148 on day 1 from an average of 0.016 on the other days. This reflects the fact that the WSJ is printed in the morning, before the day's announcements are made. A *t*-test and a non-parametric median test both indicate that the fraction of covered firms is also significantly larger on day 0 (14% larger with a *t*-stat of 4.1) and day 2 (30% larger with a *t*-stat of 8.6). Our analysis groups together articles published on days 0, 1 and 2. For simplicity, we refer to them as "announcement-day" articles.[23]

3.2 Earnings

Data on quarterly earnings announcements are obtained from IBES and Compustat from 1993 to 2002 for every firm in our sample. Following DellaVigna and Pollet (2006), we restrict the sample to announcements that are recorded in the IBES and Compustat databases with a difference of less than 5 calendar days, and take the earlier of the two whenever they differ. [24] We estimate the earnings surprise as the difference between the announced earnings recorded in IBES and the consensus earnings forecast, normalized by the share price (Kothari (2001), DellaVigna and Pollet (2006), Hirshleifer et al. (2006)). The consensus forecast is defined as the median forecast among all the analysts who issue or review a forecast in the last 2 months before the earning announcement. If an analyst makes multiple forecasts over that interval, we use only the most recent one. Specifically, denoting E_{iq} the earnings per share announced

[22] Stocks trading in any sub-period within the 10-year period, such as those listed after January 1, 1993 and those de-listed before December 31, 2000, are kept in the sample.

[23] Our data identifies whether a company is mentioned in the WSJ on a given day. It does not guarantee that articles are specifically about its earnings. However, an inspection of the data reveals that in virtually all cases, articles published on the announcement day or the two days that follow refer to the announcement. Articles published when exchanges are closed are aggregated with those observed on the first subsequent trading day, if any.

[24] DellaVigna and Pollet (2006) check the accuracy of their rule for imputing earnings announcement dates and conclude that it is "almost perfect after December 1994".

by firm i in quarter q, F_{iq} the corresponding consensus forecast, and P_{iq} the share price at the end of the announcement month, we define the earnings surprise SUR_{iq} as:

$$SUR_{iq} = \frac{E_{iq} - F_{iq}}{P_{iq}}$$

Earnings, forecasts and prices are split-adjusted. We eliminate penny stocks (observations with a share price, unadjusted for splits, below 1$) and observations with actual earnings or consensus earning forecast exceeding the stock price. Finally, we exclude observations with returns and earnings surprises in the top and bottom 5/10,000th of their distributions.

3.3 Abnormal returns and trading volume

Daily stock returns and trading volume are downloaded from CRSP. To account for return premia associated with size and book-to-market, we deduct from stock returns the return on the size and book-to-market benchmark portfolios obtained from Ken French's website.[25] For that purpose, stocks are matched to one of 25 portfolios at the end of June based on their capitalization and the end of June and their book-to-market ratio, computed as the book equity of the last fiscal year end in the prior calendar year divided by the market value of equity at the end of December of the prior year.

We estimate cumulative abnormal returns before, at and after the announcement. The announcement abnormal cumulative return is defined as the 3-day abnormal return from the close of the market on the trading day before the announcement to the close on the second trading day after , i.e. over days 0 to 2, and is denoted $CAR[0,2]_{iq}$ for firm i in quarter q. We use a 3-day window to measure the immediate response to announcements because we observe that media coverage is significantly larger over this window (Figure 2). The pre- and post-announcement abnormal cumulative returns, denoted $CAR[-30,-1]_{iq}$ and $CAR[3,72]_{iq}$, are defined respectively as the abnormal returns over the windows [-30,-1] and

[25] We use this approach rather than the Fama-French three-factor model because Daniel and Titman (1997) find that characteristics rather than estimated covariances explain better the cross-section of stock returns in the post-1963 period.

[3,72]. We use a 70 trading-day window because most of the drift occurs in the three months following announcements (Bernard and Thomas (1989)). We drop announcements with fewer than 20 daily return observations in the two months that follow the announcement.

To estimate abnormal trading volume, we compute the difference between the average daily number of shares traded at the announcement (days 0 to 2) and the average daily number of shares traded over the pre-announcement window (days -30 to -1), and divide it by their sum.

3.4 Other data

We obtain market capitalization data from CRSP, and accounting data, such as book value of assets, from Compustat. Size is defined as the log of the market value of equity. Liquidity is measured using the Amihud (2002) illiquidity ratio and equals the log of the ratio of a stock's absolute return to its dollar trading volume in a day, averaged over all days in a year. It captures the absolute percentage price change per dollar of trading volume, i.e., the price impact of trades, and is correlated with illiquidity proxies obtained from microstructure data (see Amihud (2002)). The fraction of individual ownership is estimated for each stock and year as one minus the fraction of total institutional ownership, obtained by aggregating 13f filings. Finally, we measure the degree of investor recognition for each firm using the shadow cost of incomplete information developed formally in Merton (1987). It captures the excess risk that a stock imposes on its shareholders relative to a factor model, when they are not fully diversified. This risk depends positively on the stock's idiosyncratic risk and its size and negatively on the number of investors over which it is spread. Firms with a high shadow cost are associated with a low degree of investor recognition. Following Kadlec and McConnell (1994), Foerster and Karolyi (1999) and Chen, Noronha and Singal (2004), we proxy for the shadow cost using

$$\text{Shadow Cost} = \frac{\text{Idiosyncratic Volatility x Firm Market Capitalization}}{\text{Number of Shareholders}} ,$$

where idiosyncratic volatility is the standard deviation of daily abnormal stock returns relative to the Fama-French three-factor model, and the number of shareholders is obtained from Compustat.

4. Results Based on Unmatched Announcements

We start be presenting some descriptive statistics. As a preliminary analysis, we then examine the relation between media coverage and the market reaction to earnings surprises unconditionally, i.e. without controlling for other possible determinants of this sensitivity. In sections 5 and 6, we use a matching procedure to factor out firm characteristics.

4.1 Descriptive statistics

Our final sample includes 2 837 firms and 63 101 announcements. On average, a firm has 30 valid announcements over the 10-year period, but 23% of firms have 10 or less. Panel A of Table I displays some descriptive statistics on announcing firms. As expected given our sample formation, the average firm is relatively large with a market capitalization that exceeds a billion dollars ($4,512 million), and visible with a mean (median) number of analysts of 7 (5) and about half of its shares held by individuals. Panel B provides some statistics on the coverage of earnings announcements in the WSJ. Most announcements are not reported in the WSJ. Only 16% are covered on either day 0, day 1 or day 2 and 2% are covered on at least 2 days.

We note that our sample is biased towards firms whose returns exhibit less drift. Indeed, our media data covers mostly NYSE firms and we require at least one analyst forecast from IBES. These constraints tend to rule out the smaller and less followed firms for which future returns are more predictable (Bernard and Thomas (1990), Bushan (1994)). The drift in our sample is therefore weaker than in previous studies. This makes it *less* likely to observe an attention effect, and leads to an underestimate of its true magnitude.

4.2 Attention sorts

In each calendar quarter, we perform a two-way independent sort of all quarterly earnings announcements into 2 x 5 = 10 groups based on the coverage of the announcement in the WSJ (*MEDIA*) and the earnings surprise (*SUR*). Media group 1 (*MEDIA*1) contains announcements that are covered by the WSJ on the announcement day or the 2 days that follow, and media group 0 (*MEDIA*0) contains the remaining announcements, that is announcements with no WSJ coverage on these days. Earnings surprise quintiles are numbered in increasing order from the most negative surprises (*SUR*1) to the most positive (*SUR*5).[26] In most of our analysis, we focus on extreme earnings surprises (*SUR*1 and *SUR*5), where the post-earnings announcement drift has been found to be the strongest (Bernard and Thomas (1989, 1990)). This reduces the noise stemming from observations with modest surprises and little drift (Hirshleifer et al. (2006)).

Before we can move on to analyzing returns, we need to ensure that within each earnings surprise quintiles, media groups contain observations that are similar in terms of the magnitude of the surprise. If the earnings surprise groups are too few, and the WSJ focuses its coverage on the more surprising announcements, then the size of the surprise will be larger in media group 1 than in media group 0. In this case, any return differential between covered and non-covered announcements belonging to the same surprise group could result from differences in the size of the surprise rather than in media coverage. Panel C in Table II shows that this is not a concern with surprise quintiles. The magnitude of the surprise is not significantly different across the media groups. The difference across the 2 groups has a *t*-stat of 0.5 in the most negative surprise quintile (*SUR*5) and of -1.4 in the most positive surprise quintile (*SUR*1).[27] Thus,

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[26] Unlike, DellaVigna and Pollet (2006) and Hirshleifer et al. (2006) who sort stocks into earnings surprise deciles, we use quintiles to ensure we have enough matched announcements in each extreme surprise groups in Sections 5 and 6.

[27] If anything, these slight differences in the magnitude of the earnings surprises tend to bias our results against finding any effect of the media since covered announcements tend to be associated with slightly *less* surprising announcements (the difference is positive for bad news and negative for good news). The fact that surprises are not significantly different across the media groups is further confirmed by a non-

within surprise quintiles, media groups contain announcements with similar surprise sizes, and sorts by media coverage within surprise quintiles are not further sorts by the magnitude of the surprise. We can now proceed to an examination of returns.

4.3 Return response

We estimate the average announcement-day and post-announcement cumulative abnormal returns, *CAR*[0,2] and *CAR*[3,72], in each group. Table II (Panel A) reports the returns for the most positive (*SUR*5) and the most negative earnings surprise quintiles (*SUR*1), as well as the difference in returns across the two extreme earnings surprise quintiles. These differences capture the market's reaction to the earnings news. The difference in *CAR*[0,2] measures the immediate response to the announcement – a more positive difference corresponding to a stronger response. Similarly, the difference in *CAR*[3,72] measures the drift following the announcement. This time, a more positive difference indicates a stronger drift or more underreaction to the news when it is announced, i.e. good (bad) news is followed by positive (negative) abnormal returns.

Table II reveals that investors' immediate reaction to earnings announcements is stronger when the announcement is covered in the WSJ. In Panel A, the difference in *CAR*[0,2] between the most positive (*SUR*5) and the most negative earnings surprise quintiles (*SUR*1) rises from 3.9% to 5.2% when the news is mentioned in the WSJ (the difference 1.3% is strongly statistically significant with a *t*-stat of 4.7). Figure 3 illustrates these findings. It displays daily abnormal returns for covered and uncovered announcements in both extreme surprise quintiles over a 10-day window that straddles the announcement. Table II- Panel A shows further that media coverage considerably reduces the post-announcement drift. The difference in

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parametric test (not reported). A median test rejects with a *p*-value of 0.87 the hypothesis that covered announcements are associated with a more negative surprise in the most negative quintile (*SUR*1). Similarly, it rejects with a *p*-value of 0.54 that they are associated with a more positive surprise in the most positive quintile (*SUR*5).

CAR[3,72] drops from 4.1% to 1.6%. The difference, -2.5%, is statistically significant with a *t*-stat of -3.1.[28] Figure 5 plots *CAR*[0,2] and *CAR*[3,72] across earnings surprise groups and confirms their stability.

4.4 Volume response

Panel B of Table II reports the average volume response to announcements. Trading volume surges upon an announcement in both extreme surprise quintiles regardless of whether the announcement is covered in the media (abnormal trading volume is significantly positive in media groups 0 and 1). But it grows more for covered announcements. Abnormal trading volume is larger by 73% (= 0.079/0.108) in the most negative earnings surprise quintile (*SUR*1) and by 50% (= 0.067/0.173) in the most positive quintile (*SUR*5) when the announcement is reported in the WSJ. These effects are strongly statistically significant with *t*-stats of 9.2 and 8.6. They are illustrated in Figure 4 which plots daily abnormal trading volume for both covered and uncovered announcements over the 10-day window that straddles the announcement. The difference in abnormal volume is large on days 0 to 2 and then dies out. It is also large on day -1 suggesting some front-running of the announcement.

Our findings so far show that media coverage magnifies the market reaction on the announcement day and reduces the subsequent drift. But this analysis does not control for firm characteristics that correlate with media coverage. So we cannot be sure that the return differentials we report reflect the impact of attention rather than variations in some firm characteristics. As Table III shows, many firm characteristics vary strongly with the coverage of earnings announcements in the WSJ. The table indicates that, in comparison to non-covered announcements, covered announcements are made by larger and more liquid firms, firms with a higher book-to-market ratio (value stocks, but this effect is only statistically significant for positive surprises), firms more closely followed by analysts, firms with a lower fraction of

[28] The magnitude of the drift for no-media announcements is smaller than in previous studies (Bernard and Thomas (1990)). This relates to our sample being biased towards large firms (mostly NYSE firms followed by at least one analyst) and to our relatively more recent sample period (1993-2002).

individual ownership and firms operating in the technology sector.[29] Since many of these characteristics also influence the post-earnings announcement drift, it is essential to control for them in order to isolate the impact of media coverage.[30] We take on this task in the next section.

5. Matching announcements

We use a matching procedure to control for firm determinants in assessing the impact of the media coverage. We form pairs of quarterly announcements made by the same firm in the same year and belonging to the same surprise quintile. Within each pair, one announcement receives media coverage on the announcement day or on one of the 2 days that follow, while the other does not.[31]

Table IV provides some descriptive statistics on the matches. Panel A shows that most covered announcements receive coverage on one day only. Since each pair contains an announcement that receives media coverage, the characteristics of matched announcements are comparable to those obtained for the full sample. Indeed, the characteristics of announcing firms displayed in Panel B of Table IV are similar to those of covered announcements (*MEDIA*1 row) in Table III. In particular, firms are large with an average market capitalization of 8.47 billion dollars.

Our focus is on differences between the covered and the uncovered announcement that comprise a pair, which we denote with a prefix Δ. For example, Δ*CAR*[0,2] refers to the difference in *CAR*[0,2] within pairs, namely *CAR*[0,2] for the announcement with coverage minus *CAR*[0,2] for the announcement without. Panel C shows how much time elapses between the paired announcements. On average,

[29] To classify firms in our sample as tech or non-tech stocks, we use the list of tech SIC codes and Internet IPOs in Loughran and Ritter (2004). Tech firms include Internet firms (such as e-commerce firms).

[30] Bernard and Thomas (1989), Potter (1992), Bhushan (1994) and Vega (2006) show respectively that size, institutional ownership, liquidity and analyst following are drivers of the post-earnings announcement drift.

[31] To guaranty that matched announcements are associated with surprises of similar magnitudes, we further subdivide each quintile into 6 earnings surprise groups. Announcement pairs consist of announcements belonging to the same subgroup. Panel E of Table IV confirms that this procedure leads to matched announcements that do not differ in the magnitude of the surprise. We end up with 404 (322) announcements in the bottom (top) surprise quintile.

approximately half a year (140 calendar days) separates them, and they are equally likely to occur first (the signed difference between the number of days that separates them is not significantly different from zero). Panel D presents data on the distribution of matched announcement by day of the week. Again, matched announcements do not differ significantly in the proportions of announcements occurring on various days of the week.

Finally, as we did for the analysis of the full sample, we make sure that there is no perceptible difference in the magnitude of the surprise across the paired observations. Panel E of Table IV reports the spread in surprise across the matched announcements for the two extreme surprise quintiles. It indicates that they are not significantly different from zero (the *t*-stats are 0.02 in the most negative (*SUR*1) and -0.6 in the most positive (*SUR*5)).[32] We can therefore rest assured that any difference we may find within a pair is not driven by a difference in the size of the earnings surprise. Overall, we conclude from Table IV that there is no perceptible difference in matched announcements other than in their media coverage.

5.1 Return response

We turn to the analysis of returns in Panel A of Table V. The first panel reports the difference in announcement-day abnormal returns between paired observations, $\Delta CAR[0,2]$. The presence of a WSJ article increases the immediate market response to the news: It reduces the abnormal return by 1.3% (*t*-stat of -1.4) in the most negative surprise quintile (*SUR*1), and increases the abnormal return by 1.4% (*t*-stat of 1.7) in the most positive surprise quintile (*SUR*5). The third column of the table displays the “difference in the difference”, i.e. the spread in the media impact across the two extreme surprise quintiles, i.e. the spread in the return difference within a pair of announcements. It equals 2.7% and is statistically significant (the *t*-stat equals 2.2), indicating that WSJ coverage considerably magnifies the announcement return response. These results are consistent with the pattern obtained in Table II for unmatched announcements.

[32] This result is confirmed non-parametrically. A median test of the hypothesis that the surprise difference across paired announcements, ΔSUR, equals zero is not rejected with *p*-values of 0.23 in *SUR*1 and 0.53 in *SUR*5.

Table V also shows the results for the post-announcement drift. Media coverage has a strong effect on the drift. It increases the 70-day cumulative return by 3.7% (the *t*-stat is 1.5) in the most negative surprise quintile (*SUR*1) and decreases it by 3.4% (the *t*-stat is -1.6) in the most positive quintile (*SUR*5). The difference in differences displayed in the last column is large, 7.1%, and significant (the *t*-stat is -2.1). These effects are also economically large. The drift is no longer significant for negative surprises and halved for positive surprises.[33] These findings indicate that investors' inattention, as reflected by the absence of a WSJ article on the announcement day, is an important driver of the drift. Thus, we confirm our previous finding that attention, as reflected by media coverage, magnifies the immediate return response and reduces the post-earnings announcement drift.

Panel A of Table V also provides information concerning a potential asymmetry across surprise quintiles. The statistics displayed in the last column of the panels (*SUR*5+*SUR*1) indicate whether the impact of media coverage is stronger in the top or the bottom surprise quintile. There appears to be no significant difference. The absence of an asymmetry between good and bad news is inconsistent with hypothesis 5 about the interplay between attention and short-selling constraints. A caveat is that our sample consists of relatively large stocks for which short-sales constraints may not bind.[34]

We also examine the market's behavior in the period that precedes the earnings announcement. The bottom panel of Panel A of Table V reports the within-pair difference in abnormal returns measured over a 30 trading day period before the announcement (from day -30 to -1 relative to the event), ΔCAR[-30,-1]. It shows no significant effect, neither statistically (the difference across surprise quintiles has a *t*-

[33] The drift is the following within the subsample of matched announcements. For announcements in the bottom surprise quintile, the drift equals -6.0% in the absence of media coverage (with a *t*-stat of -3.1) vs. -2.3% (with a *t*-stat of -1.2) with media coverage. For announcements in the top surprise quintile, the drift equals 7.8% in the absence of media coverage (with a *t*-stat of 4.6) vs. 4.4% (with a *t*-stat of 3.0) with media coverage.

[34] D'Avolio (2002), identifying the stocks that are difficult to short, finds that they account for only only 0.6% of the total CRSP market value. They are concentrated in the lowest NYSE size quintile and among stocks with a price below $5.

stat of 0.6), nor economically (the average daily return is 0.05% in the pre-announcement period, vs. 0.9% and 0.10% in the announcement and post-announcement windows).

To summarize, our analysis of returns reveals that announcements covered in the WSJ are associated with a stronger market reaction on the announcement day and less subsequent drift, whether the earnings news is good or bad. Thus, the evidence is consistent with hypotheses 1 and 2 which state that attention influences returns, but not with hypotheses 5 which conjectures that this influence is stronger for positive surprises than for negative surprises. These results are illustrated in Figure 1. It displays cumulative abnormal returns in event time for the two announcements in a matched pair (announcements with high coverage are represented by the solid lines, and those with low coverage by the dashed lines) and for the most negative and positive earnings surprises (respectively in the upper part of the picture in green, and in the lower part in red). The plot clearly shows that i) announcements see a strong return reaction on the day of the announcement – the jumps on day 0, which is more pronounced for announcements covered in the WSJ, and ii) returns drift less when there is a WSJ article on the announcement day – the solid lines are flatter than the dashed lines over the post-announcement period.

5.2 Volume response

We examine next trading volume. To measure the volume difference across paired announcements, we compute the difference in the average daily number of shares traded at the announcement (days 0 to 2) between matched announcements, and divide it by their sum. We denote it ΔVOL. The results displayed in Panel B of Table V are consistent with those of the full sample and hypothesis 3: Trading volume is larger for announcements with more media coverage. For announcements in the bottom quintile, trading volume is 17% larger (*t*-stat is 2.8) and for those in the top quintile, it is 16% larger (*t*-stat is 2.6). As with returns, there is no visible difference across quintiles (the *t*-stat is -0.16) in contrast with hypothesis 5 that posits a weaker attention effect for negative surprises.

6. Determinants of the Attention Effect

Having established that the market response to earnings announcement is related to the coverage of announcements in the media – a proxy for investors' attention, we attempt to identify the characteristics of announcement days and announcing firms for which this effect is the strongest.

6.1. Regression framework

There may be times when investors are more distracted, for example when the weekend approaches or when many firms are in the news. Indeed, DellaVigna and Pollet (2006) and Hirshleifer et al. (2006) show respectively that investors pay less attention to announcements when they occur on Fridays and when there are numerous earnings announcements at the same time by other firms. In these times of distraction, the occurrence of WSJ articles may overestimate how much attention is really paid to announcements. They should therefore be associated with a weaker effect of media coverage. That is, being mentioned in the WSJ does not attract as much attention from investors when many other firms are simultaneously mentioned, or when investors are thinking of the weekend ahead. We construct two proxies for investors' distraction. We count the total number of firms mentioned in the WSJ on the days an earnings announcement is covered in the WSJ, which we denote *Other_News*.[35] Similarly, we construct a dummy variable *Friday* that equals 1 if the earnings announcement is covered in the media on a Friday and 0 otherwise.

It is also plausible that some firms are constantly on investors' minds. For these firms, variations in media coverage across matched announcements may not reflect significant differences in attention, i.e. these variations may overstate the true differences in attention. If this is the case, the effect of media coverage should be smaller for these more visible firms. To proxy for the visibility of announcing firms,

[35] This variable is similar to, but broader than that used by Hirshleifer et al. (2006). They count the number of firms announcing their earnings on the same day as a given firm, while we count the number of firms featured in the WSJ on the day it is covered, whether or not these other firms are reporting earnings.

we use the shadow cost of incomplete information, a measure of firms' recognition among investors proposed by Merton (1987). Other variables positively associated with visibility are size – larger firms are better known, book-to-market – a low book-to-market usually signals a firm whose earnings have grown strongly over the previous years, analyst following, and whether they operate in the technology sector – our sample period is marked by the technology boom and bust which drew much attention from investors.[36] Finally, we study whether the media effect depends on the fraction of individual ownership, as posited in hypotheses 4a and 4b.

To summarize, we investigate whether the impact of media coverage on the market's reaction to earnings announcements is reduced on high-distraction days – days with many firms in the news and Fridays, for more visible firms – high recognition, big capitalization, low book-to-market, and technology firms, and for firms held by more individual investors. In our analysis, we control for liquidity with the Amihud (2002)'s illiquidity ratio because it is a determinant of the post-earnings announcement drift (Mendenhall (2004), Sadka (2006), Chordia et al. (2007)).

We carry out a regression analysis on the full sample of matched announcements, sorted into 5 earnings surprise groups. We run the following regressions for cumulative abnormal returns:

$$\Delta CAR = a_0 + a_1 SUR + \sum_{j=1}^{n} b_j (SUR \times X_j) + \sum_{j=1}^{n} c_j X_j + \sum_{k=1}^{m} d_k C_k + \sum_{k=1}^{m} e_k (SUR \times C_k),$$

where ΔCAR refers to $\Delta CAR[0,2]$ or $\Delta CAR[3,72]$, *SUR* indexes the surprise quintile (from 1 for the bottom quintile to 5 for the top), the X_j denote characteristic of announcements and announcing firms and the C_k denote control variables (Amihud illiquidity ratio). We sort firms into terciles for each characteristic (*Other_News*, degree of investor recognition, size, book-to-market, analyst following and fraction of individual ownership) and use the tercile index for X_j, except for *Friday* and *Tech* which are dummy

[36] Peng and Xiong (2006) show theoretically that limited attention leads to category-learning behavior, i.e. attention-constrained investors tend to allocate more attention to sector-level factors than to firm-specific factors. This behavior is consistent with the finding in Cooper et al. (2001) that firms that added a "dot.com" suffix to their name during the tech bubble without fundamentally changing their strategies earned significant abnormal returns around their name-change announcements.

variables. The coefficients of interest are the b_j. They capture the impact of the characteristics X_j on the difference in ΔCAR across surprise quintiles. For example, a negative slope b_j in the $\Delta CAR[3,72]$ regression indicates that the effect of media coverage on immediate abnormal returns is strengthened for high values of the variable X_j, i.e. that media coverage is more closely associated with attention when X_j is high. Since a stronger return reaction upon announcement corresponds to less drift over the subsequent period (Table V), we expect the estimated coefficient on the same variable in the $\Delta CAR[3,72]$ regression to have the opposite sign, i.e. to be negative in this example.

We estimate a similar regression for trading volume without the interacted terms:

$$\Delta VOL = \alpha_0 + \alpha_1 SUR + \sum_{j=1}^{n} \beta_j X_j + \sum_{k=1}^{m} \gamma_k C_k .$$

A positive coefficient β_j in the ΔVOL regression implies that media coverage increase trading volume more when the index for variable X_j is high, controlling for the factors in C_k. In both the return and volume regressions, we report *p*-values based on robust standard errors clustered by firm, and include year dummies.

6.2 Return response

Panel A of Table VI presents the results for the return regressions. Overall, the interacted variables are more successful in explaining $CAR[3,72]$ than they do in explaining $CAR[0,2]$ – no interacted variable comes up significantly at the 10% confidence level in the $CAR[0,2]$ regression, while several do in the $\Delta CAR[3,72]$ regression.

We start with firm characteristics. The coefficient estimate on the shadow cost of incomplete information is significantly negative (the *p*-value is 0.047) in the $\Delta CAR[3,72]$ regression. This means that highly recognized firms see their drift shrink less when they are covered in the media. This effect is economically large: moving from the bottom to the top shadow cost tercile leads to a 4.0% (= 0.020 x 2) decrease in $\Delta CAR[3,72]$. As a comparison, Table V shows that the presence of a WSJ article decreases on average $\Delta CAR[3,72]$ by 7.1%. These findings indicate that the impact of media coverage is less pronounced for more visible firms (the drift is reduced less), consistent with hypothesis 7. The (insignificantly) positive sign on the corresponding coefficient estimate in the $\Delta CAR[0,2]$ regression is consistent with this interpretation.

The book-to-market ratio displays a similar pattern: the drift shrinks less for growth firms (low book-to-market) than for value firms (high book-to-market). Again, this is consistent with the (insignificantly) positive coefficient in the $\Delta CAR[0,2]$ regression. The other firm characteristics are not significantly related to the impact of media coverage.[37] But it is worth noting that the sign on size and the tech dummy are in line with hypothesis 7 on firm visibility (media coverage has less influence on large firms and those operating in the tech industry, which experience a weaker increase in the immediate return reaction and a weaker decrease in the drift), while the insignificant coefficient estimate on the fraction of individual ownership casts doubt on hypotheses 4a and 4b that posit differences in attention between individual and institutional investors.

Turning to characteristics of announcement days, we see that the coefficient estimate on *Other_News* is strongly negative in the $\Delta CAR[3,72]$ regression (the p-value is 0.015). It indicates that the publication of a WSJ article about an announcement reduces the subsequent drift less on days with many firms in the media, i.e. that the impact of the article is reduced on days with much distracting news (hypothesis 6). As with the degree of investor recognition, this effect is economically large: moving from the bottom to the top *Other_News* tercile (which corresponds to a 58% increase in the number of firms mentioned in the WSJ around the covered announcement) leads to a 3.8% (= 0.019 x 2) increase in

[37] It may not be so surprising that the number of analyst does not come out significant given that all the firms in our sample are followed by at least one analyst. It is plausible that what matters to a firm's visibility are not how many analysts cover it but whether or not it is covered. Hong, Lim and Stein (2002) for example find that analysts speed up the flow of information but at a decreasing rate.

Δ*CAR*[3,72]. Such an increase in *Other_News* halves the media effect over the post-announcement window. Similarly, the impact of media coverage is less pronounced (weaker drift) when the article is released on a Friday. Indeed, the coefficient on the *Friday* dummy is significantly positive (*p*-value of 0.081). The drift reduction is 20% (= 1.4% / 7.1%) smaller when the WSJ covers an announcement on a Friday

6.3 Volume response

Panel B of Table VI displays the results for the volume regression. The shadow cost of incomplete information, the tech dummy and *Other_News* are the only significant regressors in the Δ*VOL* regression. Trading volume decreases by 10.6% (= 0.053 x 2) when the shadow cost shifts from the top to the bottom tercile (investor recognition grows), by 14.6% when the firm operates in the tech sector and by 15% when the number of firms mentioned in the WSJ around the covered announcement increases from the bottom to the top tercile. As a comparison, media coverage increases trading volume by about 16% (Table V). So these effects are economically sizeable. These findings lend support to hypothesis 7 on firm visibility and hypothesis 6 on distracting news.

The coefficient estimate on size is marginally significantly negative (*p*-value is 0.11), in line with hypothesis 8 on firm visibility. The other regressors, though not significant, have coefficient estimates which signs are by and large consistent with those of the Δ*CAR*[3,72] regression: trading volume increases less for growth firms, firms with high analyst following, and for articles published on Fridays. Individual ownership again appears to have no impact on attention.

To summarize, the regression analysis shows that the effect of media coverage on the drift is weaker for firms with a high degree of investor recognition and for growth firms, and on high-news days and Fridays. Moreover, its effect on trading volume is less pronounced for firms with strong investor recognition, for firms operating in the tech sector and on high-news days. Overall, these results lend support to the attention hypothesis by showing that media coverage has less influence for more visible firms and on high-distraction days. In the next section, we study the profitability of trading strategies based on our findings.

7. Trading Strategies

We find that the post-earnings announcement drift is larger when the announcement is not covered in the media – a result consistent with the attention hypothesis. In order to assess the economic importance of this effect, we study the profitability of a strategy that "sells the drift" when the announcement is covered in the media and "buys the drift" when it is not.

At the end of each month, we assign stocks to surprise quintiles based on their most recent earnings announcements within the last three month using the breakpoints from the previous calendar year. The media portfolio buys firms whose most recent announcement within the past three months was in the top quintile and was covered in the WSJ, and sells short firms whose most recent announcement was in the bottom quintile and was covered in the WSJ. On average, the portfolio includes 29 stocks, of which 15 are bought and 14 sold. The no-media portfolio is formed in a similar fashion, except that it only uses firms whose most recent announcement was not covered in the WSJ. On average, it contains 146 stocks, of which 76 are bought and 70 sold. We estimate monthly portfolio abnormal returns by equally weighting individual stock abnormal returns. Table VII displays the profitability of each portfolio. The abnormal return – adjusted for size, book-to-market and momentum using the characteristic-based matching procedure in Daniel, Grinblatt, Titman, and Wermers (1997) and Wermers (2004) – on the no-media (low-attention) portfolio is 1.10% per month and strongly statistically significant (the *t*-stat is 6.8). In contrast, the media (high-attention) portfolio yields an abnormal return of 0.34% which is not significantly different from 0 (the *t*-stat is 1.14). Thus, there is no perceptible post-earnings drift when announcements are covered in the WSJ.

The trading strategy that exploits the drift differential across covered and uncovered announcements is long the no-media portfolio and short the media portfolio. The bottom row of Table VI^{2}I shows that it yields an abnormal return of 0.76% per month, significant at the 1% level (the *t*-stat is 2.5). This is a sizeable risk-adjusted return of 9.1% per annum. We emphasize that our portfolio formation approach is implementable as it only makes use of data that is available on the formation date and of stocks that are relatively liquid and easy to short – our sample consists mostly of NYSE stocks with at least one analyst. The high profitability of the trading strategy confirms our finding that the post-earnings announcement drift is stronger for announcement that are not reported in the WSJ.

8. Summary and Concluding Remarks

We study whether investors' inattention contributes to the post-earnings announcement drift using media coverage as a proxy for attention. We compare announcements made by the same firm in the same year and generating the same earnings surprise, when one announcement receives more media coverage than the other, as measured by the number of *Wall Street Journal* articles covering the announcement.

Our findings can be summarized as follows. Announcements with more media coverage generate (i) a stronger price reaction and (ii) a stronger trading volume reaction at the announcement, and (iii) less subsequent drift, consistent with attention being a significant driver of the post-earnings announcement drift. (iv) We do not find that this pattern is more prominent for good news than for bad news, suggesting that short-sales constraints are not a necessary ingredient for attention to have an impact. We uncover further evidence that the attention effect is (v) less pronounced for more visible firms (firms with a high degree of investor recognition and a low book-to-market ratio) and (vi) on high-distraction days (Fridays and days with a large number of firms in the media). Together, our results lend support to the notion that limited attention is an important source of friction in financial markets.

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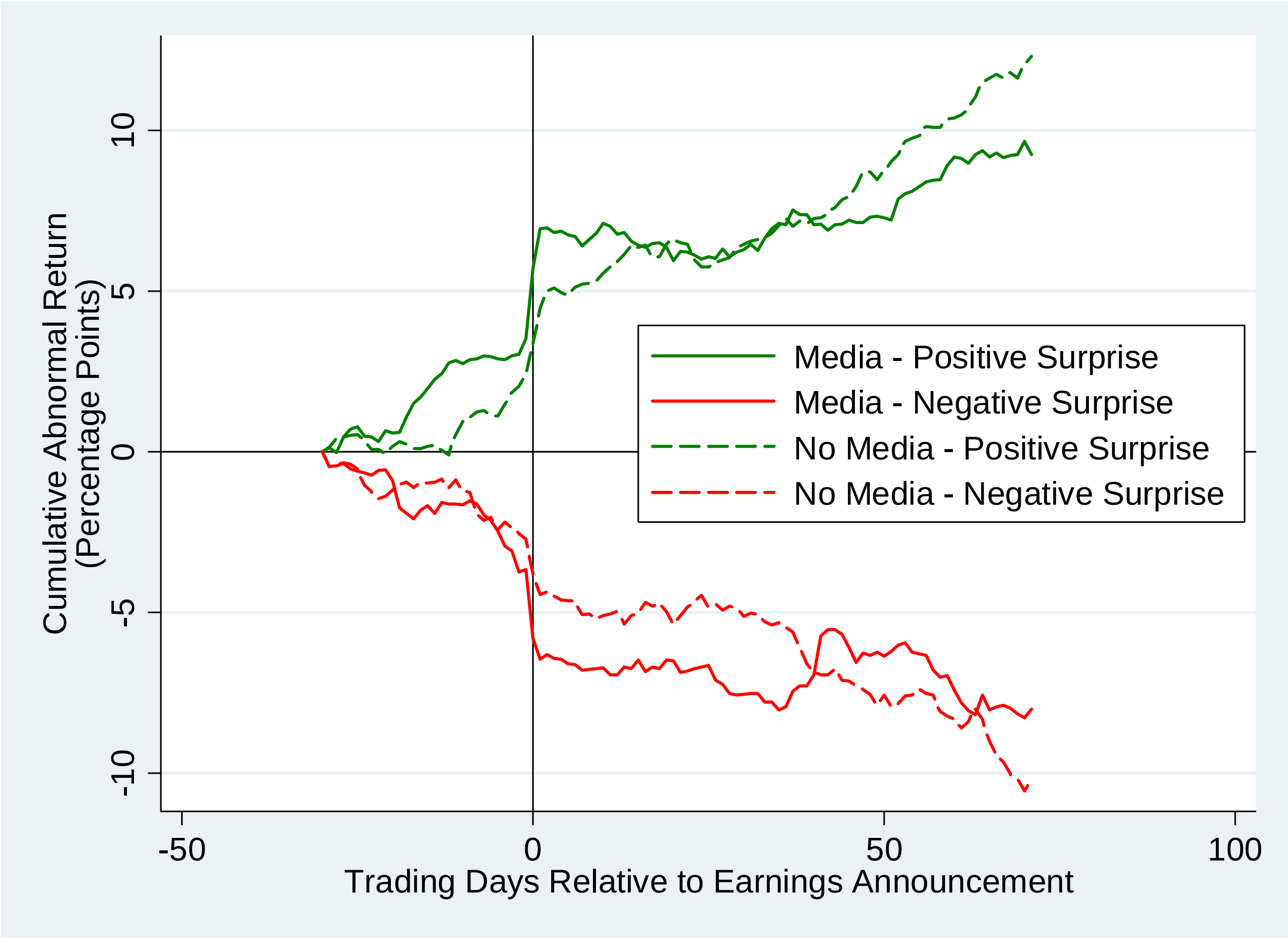


Figure 1

Firms' Valuation around Positive and Negative Earnings Surprises with and without Media Coverage.

Plotted is a firm's cumulative abnormal return from 30 trading days preceding an earnings announcement to 70 trading days following the announcement. The solid curves show the cumulative abnormal return when the announcement is covered in the *Wall Street Journal* on the day of or following the announcement (days 0 to 2), and the dashed curves when it is not covered. Abnormal returns are estimated relative to the 25 size and book-to-market portfolios. Positive surprises are those in the top quintile of the earnings surprise, *SUR*, and negative surprises are those in the bottom quintile (see the text for the definition of *SUR*). The picture uses the sample of matched announcements, i.e. pairs of announcements made by the same firm in the same calendar year and generating the same surprise, with one announcement receiving media coverage while the other does not. It shows a significant impact of media coverage. The "difference in difference" – the difference across extreme surprise quintiles in the gap between the solid and dashed curves – equals 2.7% with a *t*-stat of 2.2 over the [0,2] window and 7.1% with a *t*-stat of 2.1 over the [3,72] window (see Table V).

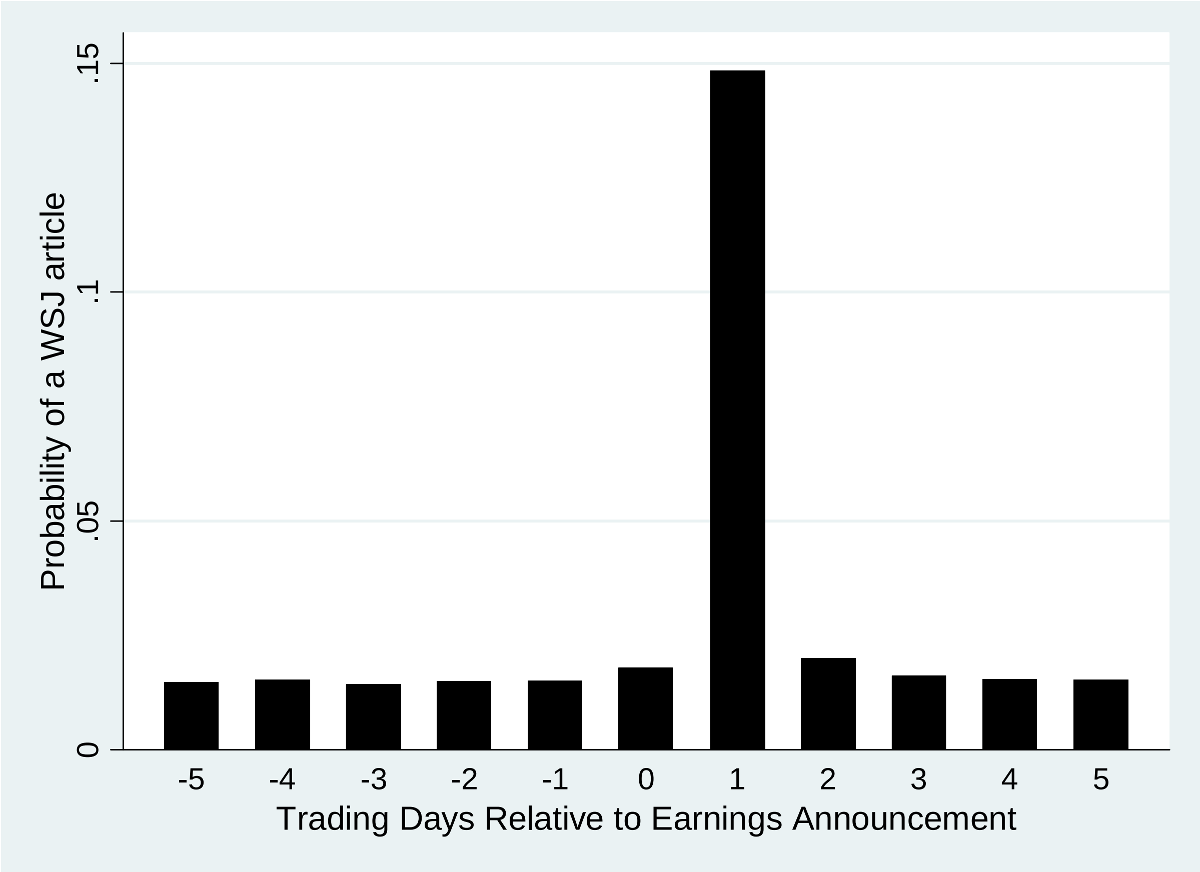


Figure 2

The Probability of a *Wall Street Journal* Article around Earnings Announcements.

The figure displays the fraction of firms featured in the *Wall Street Journal* from 5 trading days preceding an earnings announcement to 5 trading days following the announcement. Day 0 refers to the earnings announcement date. A *t*-test indicates that the fraction of covered firms is significantly larger on day 0 (the *t*-stat equals 4.1), on day 1 (the *t*-stat equals 190) and on day 2 (the *t*-stat equals 8.6). A median test confirms this conclusion (the *p*-value on the median test equals 0.000 on all three days).

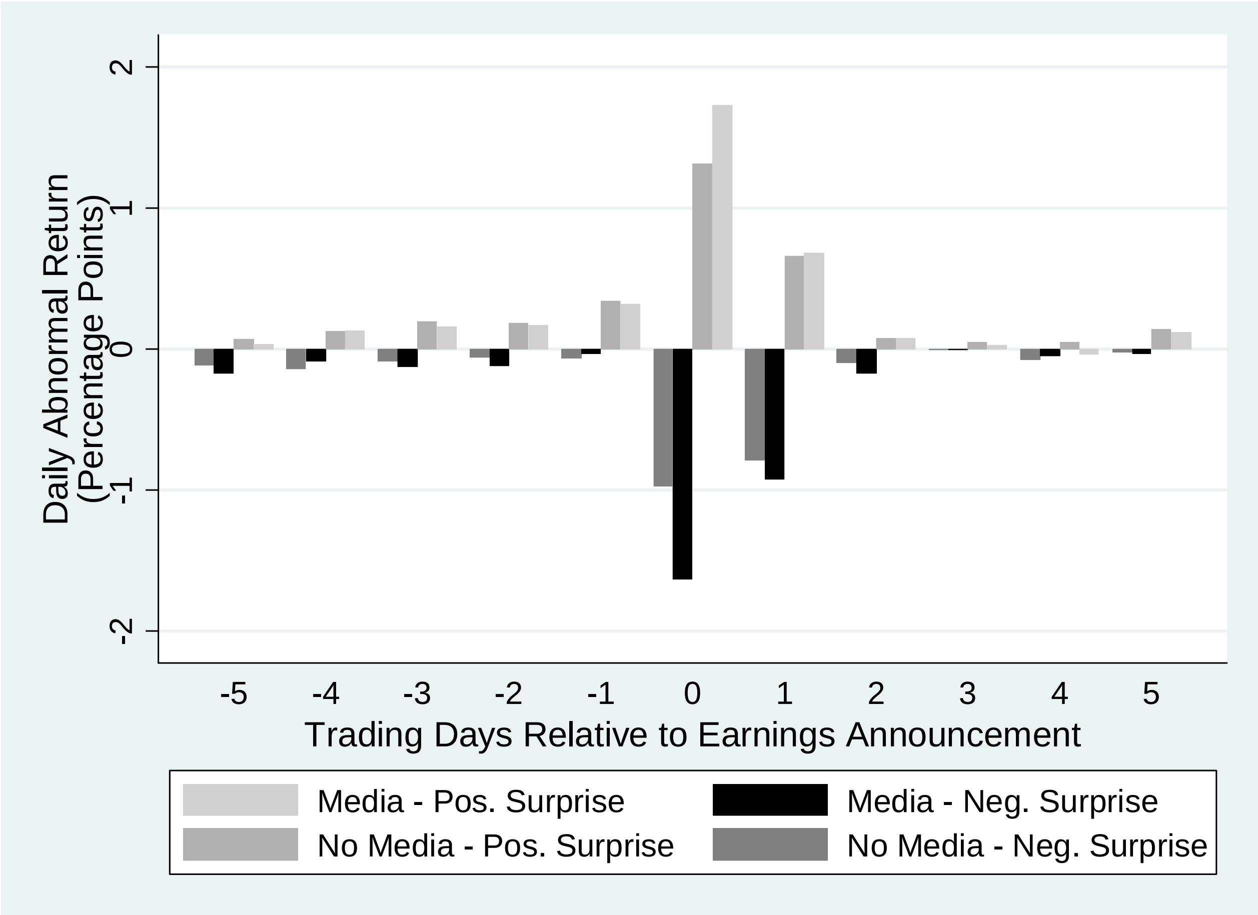


Figure 3
Firms' Daily Abnormal Return around Positive and Negative Earnings Surprises with and without Media Coverage.

The figure displays firms' daily abnormal return from 5 trading days preceding an earnings announcement to 5 trading days following the announcement (day 0 refers to the earnings announcement date). Abnormal returns are estimated relative to the 25 size and book-to-market portfolios. Announcements with media coverage are those reported in the WSJ on days 0, 1 or 2. Positive surprises are those in the top quintile of the earnings surprise and negative surprises are those in the bottom quintile (see the text for the definition of earnings surprise, *SUR*). The picture uses the full sample of (unmatched) announcements.

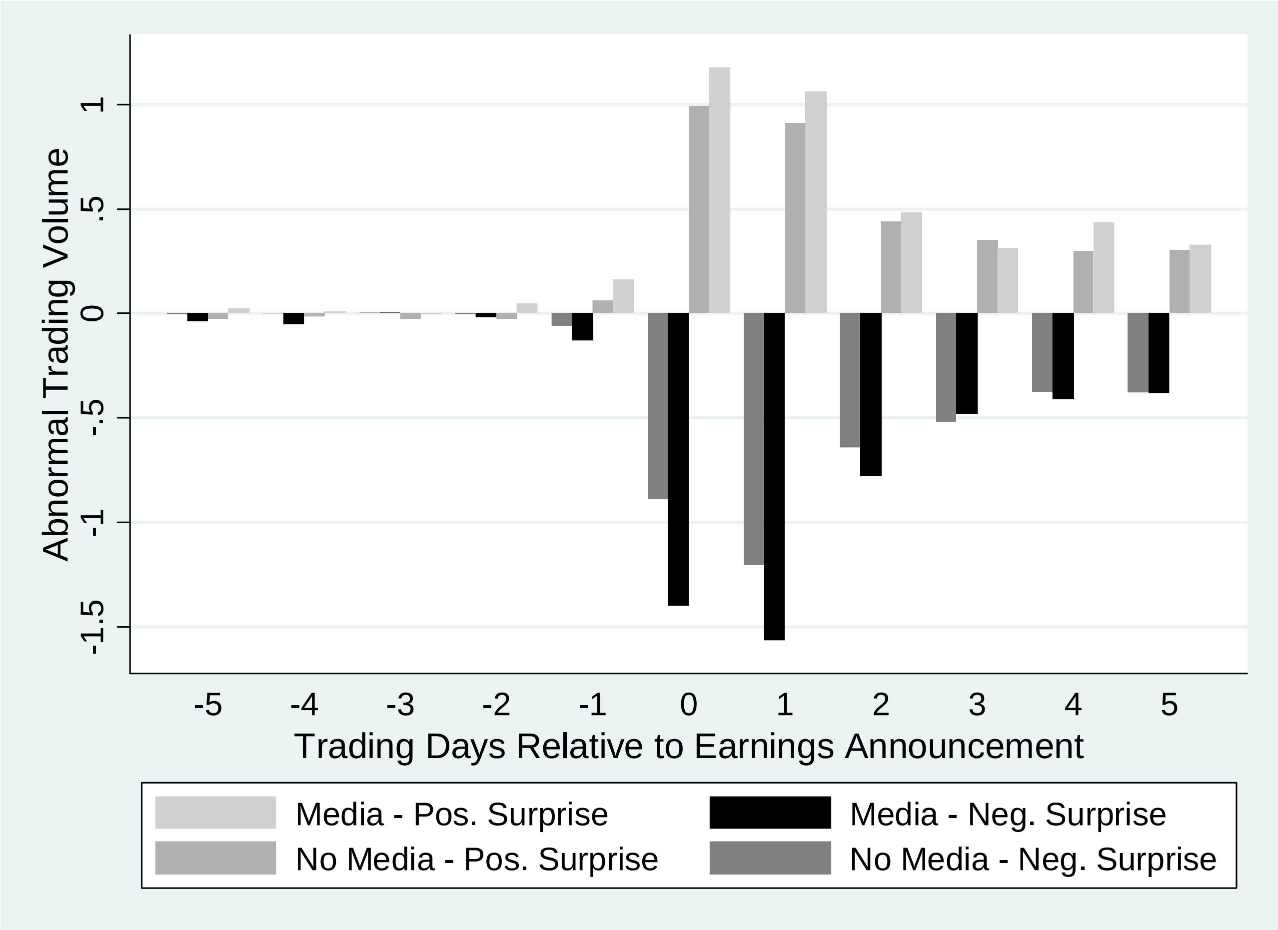


Figure 4

Firms' Abnormal Trading around Positive and Negative Earnings Surprises with and without Media Coverage.

The figure displays firms' daily abnormal trading volume from 5 trading days preceding an earnings announcement to 5 trading days following the announcement (day 0 refers to the earnings announcement date). Abnormal trading volume is defined as the ratio of the difference between the average daily number of shares traded at the announcement (days 0 to 2) and the average daily number of shares traded over the pre-announcement (days -30 to -1), to their sum. Announcements with media coverage are those reported in the WSJ on days 0, 1 or 2. Positive surprises are those in the top quintile of the earnings surprise and negative surprises are those in the bottom quintile (see the text for the definition of earnings surprise, *SUR*). Trading volume for negative surprises is plotted with a negative sign (bottom portion of the graph). The picture uses the full sample of (unmatched) announcements.

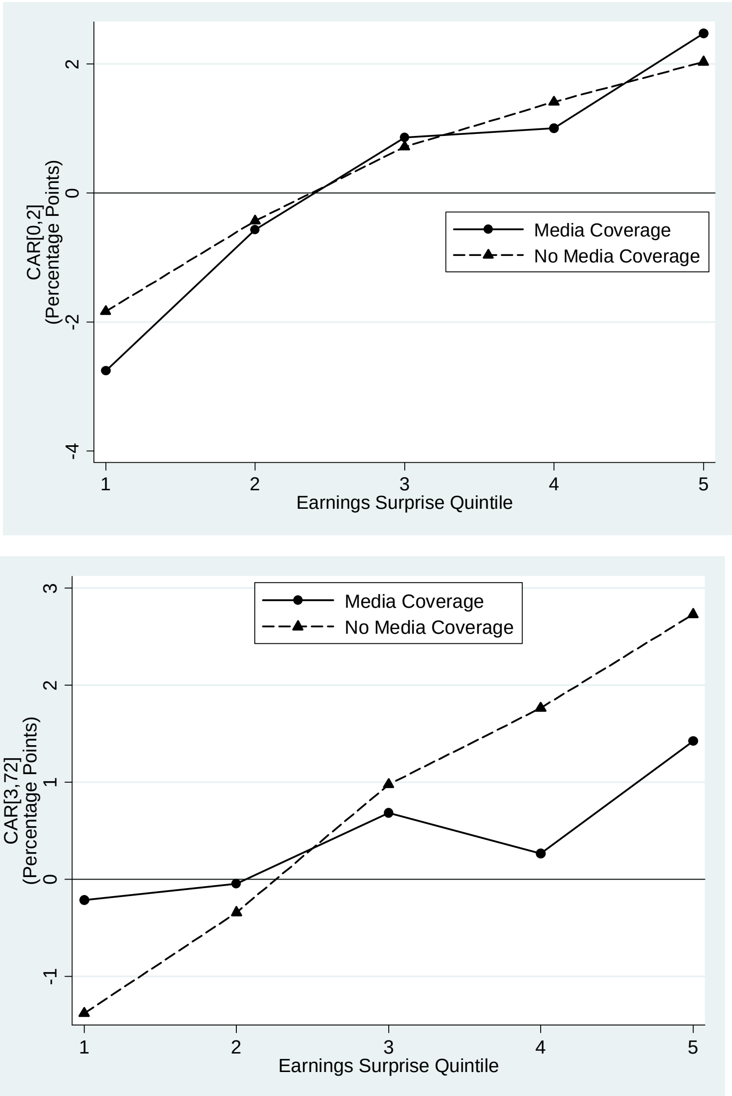
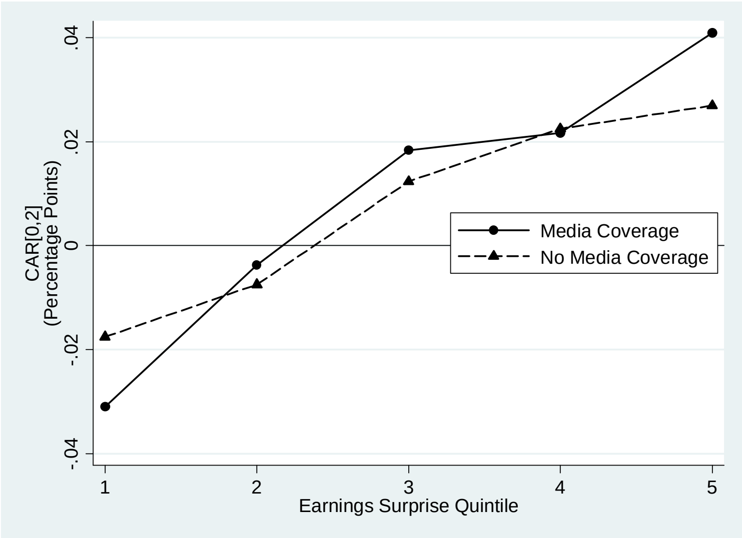


Figure 5

Market Response to Earnings Surprises with and without Media Coverage (Full sample).

The figure plots cumulative abnormal returns for firms making an earning announcement, as a function of the earnings surprise quintile, when the announcement is covered in the media (solid lines) and when it is not (dashed lines). The pictures display average cumulative abnormal returns estimated over the 3-day announcement window (*CAR*[0,2] in the top picture), and over the 70-day post-announcement window (*CAR*[3,72] in the bottom picture). Abnormal returns are estimated relative to the 25 size and book-to-market portfolios. Announcements with media coverage are those reported in the WSJ on days 0, 1 or 2. The picture uses the full sample of (unmatched) announcements.



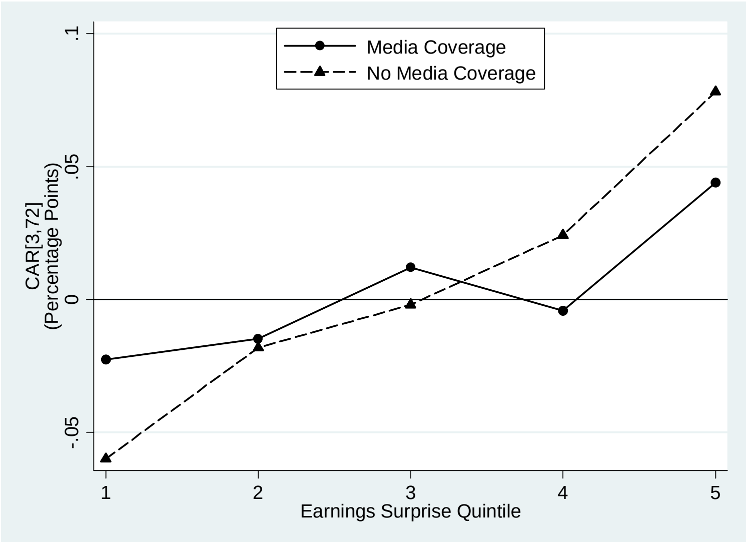


Figure 6

Market Response to Earnings Surprises with and without Media Coverage (Matched Announcements).

The figure shows the effect of media coverage on average cumulative abnormal as a function of the earnings surprise quintile, when the announcement is covered in the media (solid lines) and when it is not (dashed lines). Estimates are based on a matching sample consisting of pairs of announcements made by the same firm in the same calendar year and belonging to the same surprise quintile, with one announcement receiving media coverage while the other does not. The difference in average cumulative abnormal returns across matched announcements (media minus no-media) is reported for the 3-day announcement window ($\Delta CAR[0,2]$ in the top picture) and the 70-day post-announcement window ($\Delta CAR[3,72]$ in the bottom picture). Abnormal returns are estimated relative to the 25 size and book-to-market portfolios. Announcements with media coverage are those reported in the WSJ on days 0, 1 or 2.

Table I

Descriptive Statistics.

Characteristics of announcements and announcing firms are displayed. In Panel A, the number of articles is the average daily number of articles published in the *Wall Street Journal* over the three days that comprise an announcement (the announcement day – day 0, and the two days that follows – days 1 and 2). Size is measured as the log of the average market capitalization of equity in thousand dollars. Book-to-market is measured as the book-value of equity over market value of equity as of the previous year end. The number of analysts refers to the number of analysts issuing an earnings forecast on the stock. Individual ownership is calculated as one minus the aggregate institutional ownership obtained from 13f data. Amihud (2002)'s illiquidity ratio equals the ratio of a stock's absolute return to its dollar trading volume in a day, averaged over all days in a year. The earnings surprise *SUR* is defined as the difference between the announced earnings and the consensus earnings forecast, normalized by the share price (all split-adjusted). In Panel B, we report the number and fraction of announcements according to the number of articles they receive.

Panel A: Characteristics of Announcements and Announcing Firms

	Obs.	Mean	Median	S.D.	Min	Max
Size	63 075	13.804	13.704	1.648	7.848	20.078
Book-to-market	62 219	2.592	1.408	4.547	0.009	182.209
Amihud illiquidity	63 101	0.141	0.008	1.288	0.000	136.091
Individual ownership	63 039	0.554	0.507	0.273	0.001	1.000
Number of analysts	63 101	6.827	5.000	5.526	1.000	42.000
Surprise *SUR*	62 835	-0.002	0.000	0.027	-1.816	0.926
Number of articles	63 101	0.062	0.000	0.149	0.000	1.000

Panel B: Distribution of Announcements by Media Coverage

	All	No article	1 article	2 articles	3 articles
Number	63,101	52,815	9,062	1,064	160
Fraction	100.00%	83.70%	14.36%	1.69%	0.25%

Table II

Market Response to Positive and Negative Earnings Surprises with and without Media Coverage (Full sample).

Cumulative abnormal returns and abnormal trading volume around earnings announcements for extreme surprise quintiles (*SUR*1: bad news, *SUR*5: good news) with and without media coverage are estimated. Announcements with media coverage are those reported in the *Wall Street Journal* on the day of the announcement or on one of the two days that follow (days 0 to 2). In Panel A, average cumulative abnormal returns are estimated for the 3-day announcement window (*CAR*[0,2]), and for the 70-day post-announcement window (*CAR*[3,72]). Abnormal returns are estimated relative to the 25 size and book-to-market portfolios. *t*-statistics are displayed in parenthesis. Panel B shows estimates of abnormal trading volume for the 3-day announcement window. Abnormal trading volume is defined as the difference between the total number of shares traded over the announcement window (days 0 to 2) and the number of shares traded over preceding 30 days (days -30 to -1), divided by their sum. *t*-statistics are displayed in parenthesis.

Panel A: Cumulative Abnormal Returns

	CAR [0,2]				*CAR* [3,72]		
	SUR 1	*SUR* 5	*SUR* 5-*SUR* 1		*SUR* 1	*SUR* 5	*SUR* 5-*SUR* 1
MEDIA 0	-1.80%	2.10%	3.90%	*MEDIA* 0	-1.30%	2.80%	4.10%
	(-23.76)	(28.61)	(36.9)		(-5.94)	(12.77)	(13.12)
MEDIA 1	-2.70%	2.50%	5.20%	*MEDIA* 1	-0.20%	1.40%	1.60%
	(-11.9)	(13.42)	(17.7)		(-0.35)	(2.82)	(2.15)
MEDIA 1-*MEDIA* 0	-0.90%	0.40%	1.30%	*MEDIA* 1-*MEDIA* 0	1.10%	-1.30%	-2.50%
	(-4.21)	(2.33)	(4.68)		(1.94)	(-2.4)	(-3.06)

Panel B: Abnormal Trading Volume

	SUR 1	*SUR* 5
MEDIA 0	0.108	0.133
	(32.71)	(43.85)
MEDIA 1	0.187	0.200
	(25.58)	(33.38)
MEDIA 1-*MEDIA* 0	0.079	0.067
	(9.22)	(8.65)

Panel C: Earnings Surprise *SUR*

	SUR 1	*SUR* 5
MEDIA 0	-0.016	0.007
	(-30.6)	(39.4)
MEDIA 1	-0.017	0.006
	(-12.58)	(30.35)
MEDIA 1-*MEDIA* 0	-0.001	-0.001
	(-0.49)	(-1.36)

Table III

Characteristics of Announcing Firms with and without Media Coverage.

Average characteristics of announcing firms are estimated for earnings in extreme surprise quintiles (*SUR*1: bad news, *SUR*5: good news) with and without media coverage. Announcements with media coverage are those reported in the *Wall Street Journal* on the day of the announcement or on one of the two days that follow (days 0 to 2). Size is measured as the log of the average market capitalization of equity in thousand dollars. Book-to-market is measured as the book-value of equity over market value of equity as of the previous year end. The number of analysts refers to the number of analysts issuing an earnings forecast on the stock. Individual ownership is calculated as one minus the aggregate institutional ownership using 13f data. Amihud (2002)'s illiquidity ratio equals the ratio of a stock's absolute return to its dollar trading volume in a day, averaged over all days in a year. *t*-statistics are displayed in parenthesis.

Size		
	SUR 1	*SUR* 5
MEDIA 0	12.911	13.086
MEDIA 1	14.507	14.718
MEDIA 1-*MEDIA* 0	1.596	1.632
	(42.57)	(46.66)

Individual Ownership		
	SUR 1	*SUR* 5
MEDIA 0	0.622	0.593
MEDIA 1	0.534	0.506
MEDIA 1-*MEDIA* 0	-0.088	-0.088
	(-13.38)	(-12.98)

Book-to-Market		
	SUR 1	*SUR* 5
MEDIA 0	2.954	3.062
MEDIA 1	3.089	4.020
MEDIA 1-*MEDIA* 0	0.135	0.958
	(1.09)	(7.75)

Number of Analysts		
	SUR 1	*SUR* 5
MEDIA 0	4.508	4.626
MEDIA 1	9.281	9.582
MEDIA 1-*MEDIA* 0	4.773	4.956
	(43.43)	(45.15)

Amihud Illiquidity		
	SUR 1	*SUR* 5
MEDIA 0	0.324	0.210
MEDIA 1	0.046	0.033
MEDIA 1-*MEDIA* 0	-0.279	-0.177
	(-5.72)	(-6.04)

Fraction Operating in the Tech Sector		
	SUR 1	*SUR* 5
MEDIA 0	0.109	0.119
MEDIA 1	0.201	0.179
MEDIA 1-*MEDIA* 0	0.093	0.060
	(11.26)	(7.12)

Table IV

Descriptive Statistics for Matched Announcements.

Panel A reports the number of paired announcements for various combinations of media coverage. Each announcement pair consists of a high- and a low-coverage announcement such that they are made by the same firm in the same calendar year, belong to the same surprise quintile and only one is covered in the *Wall Street Journal* on the day of or following the announcement (days 0 to 2). Covered announcements are either featured in the WSJ on one day, on two days or on all three days. Panel B presents summary characteristics of firms whose announcements are matched. Size is measured as the log of the average market capitalization of equity in thousand dollars. Book-to-market is measured as the book-value of equity over market value of equity as of the previous year end. The number of analysts refers to the number of analysts issuing an earnings forecast on the stock. Individual ownership is calculated as one minus the aggregate institutional ownership using 13f data. Amihud (2002)'s illiquidity ratio equals the ratio of a stock's absolute return to its dollar trading volume in a day, averaged over all days in a year. Panel C presents data on the time elapsed between the two announcements that comprise a pair. ΔNet_Number_Days denotes the difference in the number of calendar days between two announcements (a negative number indicates that the covered announcement occurs before the uncovered one, while a positive number indicates that it occurs after). ΔNumber_Days is the absolute value of the difference in the number of calendar days between two announcements (a negative number indicates that the covered announcement occurs before the uncovered one, while a positive number indicates that it occurs after). Panel D shows the distribution of matched announcements by day of the week. Panel E reports the average difference in earnings surprise Δ*SUR* across matched announcements (some-media minus no-media). The earnings surprise *SUR* is defined as the difference between the announced earnings and the consensus earnings forecast, normalized by the share price (all split-adjusted). *t*-statistics are displayed in parenthesis.

Panel A: Number of Announcements by Amount of Media Coverage

	Number of announcements			
Number of articles about the covered announcement over the 3-day announcement window	1	2	3	Total
*SUR*1	398	4	2	404
*SUR*5	298	22	2	322
All *SUR* groups	2,038	128	10	2 176

Table IV (Continued)

Panel B: Firm Characteristics

	# of ann.	Mean	Median	S.D.	Min	Max
Log size	2 174	14.694	14.713	1.636	9.331	19.998
Book-to-makrket	2 142	2.484	1.226	5.487	0.059	96.151
Amihud illiquidity	2 176	0.050	0.002	0.420	0.000	8.530
Individual ownership	2 176	0.510	0.438	0.274	0.016	1.000
Number of analysts	2 176	9.579	9.000	6.087	1.000	33.000
Fraction in tech sector	2 176	0.188	0.000	0.391	0.000	1.000

Panel C: Difference in Number of Calendar Days across Matched Announcements

ΔNet_Number_Days			ΔNumber_Days		
SUR 1	*SUR* 5	*SUR* 5-*SUR* 1	*SUR* 1	*SUR* 5	*SUR* 5-*SUR* 1
5.10	-8.90	-14.00	140.71	144.34	3.63
(0.47)	(-0.71)	(-0.85)	(32.16)	(26.72)	(0.53)

Panel D: Fraction of Announcements by Day of the Week

	Bottom Surprise Quintile: *SUR* 1			
Day of the week	No media	Media	Media-No media	t-stat for Media-No media
Monday	0.158	0.178	0.020	0.61
Tuesday	0.218	0.188	-0.030	-0.83
Wednesday	0.228	0.243	0.015	0.40
Thursday	0.292	0.267	-0.025	-0.66
Friday	0.104	0.124	0.020	0.67

	Top Surprise Quintile*: SUR5*			
Day of the week	No media	Media	Media-No media	t-stat for Media-No media
Monday	0.093	0.143	0.050	1.42
Tuesday	0.280	0.242	-0.037	-0.85
Wednesday	0.273	0.292	0.019	0.45
Thursday	0.280	0.230	-0.050	-1.11
Friday	0.075	0.093	0.019	0.77

Panel E: Difference in *SUR* across Matched Announcements, Δ*SUR*

SUR 1	*SUR* 5	*SUR* 5-*SUR* 1
0.00%	-0.10%	-0.10%
(0.02)	(-0.59)	(-0.1)

Table V

Market Response to Positive and Negative Earnings Surprises with and without Media Coverage (Matched Announcements).

The effect of media coverage on average cumulative abnormal returns and on abnormal trading volume is estimated over various windows around earnings announcements for extreme surprise quintiles (*SUR*1: bad news, *SUR*5: good news). Announcements with media coverage are those reported in the *Wall Street Journal* on the day of the announcement or on one of the two days that follow (days 0 to 2). Estimates are based on a matching sample consisting of pairs of announcements made by the same firm in the same calendar year and belonging to the same surprise quintile, with one announcement receiving media coverage while the other does not. In Panel A, the difference in average cumulative abnormal returns across matched announcements (media minus no-media) is reported for the 3-day announcement window (Δ*CAR*[0,2]), the 70-day post-announcement window (Δ*CAR*[3,72]) and the 30-day pre-announcement window (Δ*CAR*[-30,-1). Abnormal returns are estimated relative to the 25 size and book-to-market portfolios. In Panel B, the relative difference in average trading volume across matched announcements is reported (Δ*VOL*). The volume difference is measured as the difference between the average daily number of shares traded at the announcement (days 0 to 2) between matched announcements, divided by their sum. *t*-statistics are displayed in parenthesis.

Panel A: Cumulative Abnormal Returns

Δ*CAR* [3,72]			
SUR1	*SUR5*	*SUR5-SUR1*	*SUR5+SUR1*
3.70%	-3.40%	-7.10%	0.30%
(1.45)	(-1.55)	(-2.05)	(0.1)

Δ*CAR* [0,2]			
SUR1	*SUR5*	*SUR5-SUR1*	*SUR5+SUR1*
-1.30%	1.40%	2.70%	0.10%
(-1.44)	(1.72)	(2.15)	(0.04)

Δ*CAR* [-30,-1]			
SUR1	*SUR5*	*SUR5-SUR1*	*SUR5+SUR1*
-0.40%	1.10%	1.40%	0.30%
(-0.2)	(0.62)	(0.56)	(0.1)

Panel B: Abnormal Trading Volume

ΔVOL		
SUR 1	*SUR* 5	*SUR* 5-*SUR* 1
16.80%	15.50%	-1.30%
(2.83)	(2.58)	(-0.16)

Table VI

Determinants of the Impact of Media Coverage on Cumulative Abnormal Returns and Trading Volume Around Positive and Negative Earnings Surprises.

The effect of media coverage on abnormal returns (Panel A) and trading volume (Panel B) is regressed on characteristics of announcements and announcing firms for extreme surprise quintiles. In both panels, announcements with media coverage are those reported in the *Wall Street Journal* on the day of the announcement or the two days that follow (days 0 to 2). Estimates are based on a matching sample consisting of pairs of announcements made by the same firm in the same calendar year and belonging to the same surprise quintile, with one announcement receiving media coverage while the other does not.

Regressors are index of terciles (except for *Friday* and *Tech* which are dummy variables) based on the following variables. *Other_News* is the total number of firms mentioned in the WSJ around the covered announcement (on days 0 to 2). *Friday* is a dummy variable that equals 1 if the earnings announcement is covered in the WSJ on a Friday and 0 otherwise. The market and book values of equity are measured at the end of the previous calendar year. *Size* is the log of the market value of equity. *Illiquidity* refers to Amihud (2002)'s illiquidity ratio and equals the ratio of a stock's absolute return to its dollar trading volume in a day, averaged over all days in a year. *Individual* is the fraction of individual ownership defined as one minus the fraction of total institutional ownership, obtained by aggregating 13f filings. *Analysts* refers to the number of analysts issuing an earnings forecast on the stock. *Tech* is a dummy that equals 1 if the firms operates in the technology sector and 0 otherwise, according to the classification in Loughran and Ritter (2004). *Merton's shadow cost of incomplete information* is negatively related to the degree of investor recognition. It is defined as

$$\text{Shadow Cost} = \frac{\text{Idiosyncratic Volatility x Firm Market Capitalisation}}{\text{Number of Shareholders}}$$

where idiosyncratic volatility is the standard deviation of daily abnormal stock returns relative the Fama-French three factor model.

In Panel A, the dependent variable is the difference in average cumulative abnormal returns across matched announcements (some-media minus no-media), reported for the 3-day announcement window (ΔCAR[0,2]) and the 70-day post-announcement window (ΔCAR[3,72]). Abnormal returns are estimated relative to the 25 size and book-to-market portfolios. *SUR* indexes the surprise quintile (from 1 for the bottom quintile to 5 for the top). The following regressions are estimated:

$$\Delta CAR = a_0 + a_1 SUR + \sum_{j=1}^{n} b_j (SUR \times X_j) + \sum_{j=1}^{n} c_j X_j + \sum_{k=1}^{m} d_k C_k + \sum_{k=1}^{m} e_k (SUR \times C_k),$$

where ΔCAR refers to ΔCAR[0,2] or ΔCAR[3,72], the X_j denote characteristics of announcements (*Other_News* and *Friday*) and of announcing firms (shadow cost, size, book-to-market, analysts, *Tech*), and the C_k denote control variables (Amihud illiquidity ratio).

Table VI (Continued)

In Panel B, the dependent variable is the relative difference in average trading volume across matched announcements (ΔVOL). The volume difference across paired announcements is measured as the difference between the daily number of shares traded at the announcement (days 0 to 2) across paired announcements, divided by their sum. The following regression is estimated:

$$\Delta VOL = \alpha_0 + \alpha_1 SUR + \sum_{j=1}^{n} \beta_j X_j + \sum_{k=1}^{m} \gamma_k C_k ,$$

where the independent variables are defined above for Panel A.

In both panels, the symbols ***, ** and * denote significance at the 1%, 5% and 10% levels respectively, for the two-tailed hypothesis test that the coefficient equals zero. *p*-values based on robust standard errors clustered by firm are displayed in brackets. Year dummies are included in the regressions as controls.

Panel A: Cumulative Abnormal Returns

	$\Delta CAR\,[0,2]$	$\Delta CAR\,[3,72]$
SUR x Shadow cost	0.002	-0.018**
	[0.627]	[0.045]
SUR x Size	-0.011	0.011
	[0.161]	[0.546]
SUR x Book-to-market	0.002	-0.018*
	[0.544]	[0.065]
SUR x Analysts	-0.002	-0.002
	[0.672]	[0.892]
SUR x Tech	-0.003	0.011
	[0.580]	[0.514]
SUR x Individual	0.004	0.005
	[0.262]	[0.619]
SUR x Other_News	0.001	0.021***
	[0.745]	[0.009]
SUR x Friday	-0.001	0.014*
	[0.732]	[0.083]
SUR x Illiquidity	-0.008	0.006
	[0.370]	[0.758]
R2	0.020	0.050
# announcement pairs	1,035	1,035

Panel B: Trading Volume

	ΔVOL
Shadow cost	0.053*
	[0.100]
Size	-0.102
	[0.110]
Book-to-market	0.043
	[0.157]
Analysts	-0.029
	[0.441]
Tech	-0.146**
	[0.011]
Individual	0.042
	[0.179]
Other_News	-0.075**
	[0.020]
Friday	-0.031
	[0.404]
Illiquidity	-0.090
	[0.155]
R2	0.030
# announcement pairs	1,018

Table VII

Performance of Post-Earnings Announcement Drift Portfolios.

The monthly return of a trading strategy that exploits the drift differential across covered and uncovered announcements from March 1993 to December 2002 is estimated. At the end of each month, we assign stocks to surprise quintiles based on their most recent earnings announcements within the last three month and the breakpoints from the previous calendar year. The high-attention (media) portfolio buys firms whose most recent announcement within the past three months was in the top quintile and was covered in the WSJ, and sells short firms whose most recent announcement was in the bottom quintile and was covered in the WSJ. The low-attention (no-media) portfolio is formed in a similar fashion, except that it only uses firms whose most recent announcement was not covered in the WSJ. The last row reports the abnormal return of a trading strategy that is long the no-media portfolio and short the media portfolio. Both raw and abnormal returns are reported. Abnormal returns are estimated using the characteristic-based benchmarks of Daniel, Grinblatt, Titman, and Wermers (1997) which control for size, book-to-market and momentum. *t*-statistics are displayed in parenthesis.

Portfolio	Monthly Raw Return	Monthly Abnormal Return
Low attention (No-media)	1.28%	1.10%
	(7.54)	(6.8)
High attention (Media)	0.41%	0.34%
	(1.32)	(1.14)
Trading strategy: Long low-attention and short high-attention	0.86%	0.76%
	(2.95)	(2.48)