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Abstract

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Keywords: Institutional Investors, Trading, Scandal, Option Backdating, Local Investors.

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Abstract – This paper examines the role of institutional trading during the option backdating scandal of 2006-2007. Unlike their inability to anticipate other corporate events, institutional investors as a group display negative abnormal trading imbalances (i.e., buy minus sell volumes) in anticipation of firm-specific backdating exposures. Consistent with informed trading, the underlying trades earn positive abnormal short- and long-term profits. Moreover, the negative abnormal imbalances are larger in magnitude when backdating is likely a more severe issue and manifest earlier ahead of firm-specific exposures as the scope of the scandal broadens. Local institutions, in particular, display negative trading imbalances earlier in event-time and earn consistently higher trading profits than non-local institutions. Although we find some evidence of over-reaction following the arrival of information about the backdating scandal, these patterns are short-lived and exclusively due to the activity of non-local institutions. Overall, institutions, particularly local ones, behave as informed investors during this prolonged period of heightened uncertainty about corporate reporting and governance practices.

1 Introduction

Institutional investors managing large portfolios tend to be viewed as more sophisticated and better informed than individual investors. As such, their trading activities may play a crucial role in the impounding of information in market prices (e.g., Holden and Subrahmanyam, 1992; Sias and Starks, 1997; Boehmer and Kelley, 2009). Yet, systematic patterns in institutional activity such as positive-feedback trading (De Long et al., 1990; Griffin, Harris, and Topaloglu, 2003) and herding behavior (Scharfstein and Stein, 1990; Bikhchandani, Hirshleifer, and Welch, 1992; Avery and Zemsky, 1998; Sias, 2004) may destabilize the price formation process and hamper market efficiency.

Reflecting the conflicting views regarding the information role of institutional investors, existing empirical studies also reach conflicting conclusions about institutional investors' ability to anticipate value-relevant corporate events. Campbell, Ramadorai, and Schwartz (2009) document that institutional investors anticipate earnings surprises and post-earnings announcement drift using a decomposition of the TAQ data. In contrast, studies using proprietary trading data find no evidence that institutional investors as a group trade in the right direction prior to major corporate announcements, e.g., large earnings surprises (Griffin, Shu, and Topaloglu, 2012) or takeover announcements (Jegadeesh and Tang, 2010).[1]

In this paper, we use actual trades data from *ANcerno* to assess the role of institutional investors during a wave of heightened uncertainty about the governance and reporting quality of hundreds of listed companies: the stock-option backdating scandal of 2006-2007. In this setting, we aim to address the following research questions. Do institutional trading activities anticipate firm-specific exposures of corporate misconduct? Does the role of institutional activities ahead of such firm-specific news vary predictably across firms/institutions? Do institutions over-react to the arrival of information about firms' likely and/or actual misconduct, thereby destabilizing the price formation process?

[1]The two studies find conflicting results regarding whether *some* institutional investors are able to take advantage of their connections with investment banks. Griffin, Shu, and Topaloglu (2012) finds no evidence of such advantage, while Jegadeesh and Tang (2010) documents significant buying by institutional clients of target advisors during the one month before takeovers.

To the best of our knowledge, there is no prior systematic analysis of the role of institutional trading around exposures of corporate reporting and governance failures. We believe it is important to fill this void for several reasons and, in this regard, the option backdating scandal of 2006-2007 provides a unique setting to do so. First, exposures of backdating practices are associated with large (negative) abnormal changes in market valuations, -9% on average (e.g., Bernile and Jarrell, 2009), allowing for sharper identification of the role of institutional investors' activities in the price formation process. Second, it is important to note that backdating events are exogenous to firm operations, which reduce concerns that the corresponding institutional activity may reflect information about firm performance. Moreover, information about backdating practices is unlikely to be disseminated privately by insiders, unlike other events that have been explored in the literature, such as the merger and acquisition events examined in Griffin, Shu, and Topaloglu (2012) and Jegadeesh and Tang (2010). Therefore, evidence of anticipatory trades by institutions ahead of firm-specific exposures is more likely to reflect the institutions' superior ability to process publicly available information, rather than their access to private information.

Lastly, while corporate scandals are not typically systematic events, their determinants may be correlated across firms, resulting in waves of correlated exposures (Gleason et al., 2008; Carow et al., 2009). The backdating events were unexpected at first and received massive media exposure, with the Wall Street Journal (*WSJ*, henceforth) leading the way with its first front-page story, 'The Perfect Payday', on March 18, 2006.[2] The subsequent series of firm-specific exposures evolved over a prolonged period and ultimately involved scores of companies. These features allow us to examine whether and how anticipatory trades of institutional investors ahead of firm-specific exposures vary as events unfolded in the public domain, e.g., the WSJ coverage.

[2]Academic studies on stock price patterns around CEO stock option grants by Lie (2005) and Heron and Lie (2007) provided the basis for the Pulitzer Prize–winning series of investigative articles by the WSJ in 2006. In their followup paper, Heron and Lie (2009) estimated that as many as 23% of option grants had more favorable return patterns (i.e., low return prior to the grant and high return subsequent to it) than randomly selected grants in the years leading up to Sarbanes-Oxley, consistent with backdating of grants. In a 2006 study by the Center for Financial Research and Analysis (CFRA), 17% of sample firms had, on three or more occasions, option grant dates that were at or near 40-day stock price lows and were immediately followed by a significant stock increase.

Our empirical tests and main findings can be summarized as follows. First, we find that institutional abnormal trading imbalances (i.e., buy minus sell) are significantly negative during the trading month prior to the first firm-specific news of potential option backdating problems. This evidence is consistent with institutional traders anticipating information about the negative effects of firm-specific backdating exposures.[3] Supporting this interpretation, negative pre-exposure trading imbalances are larger in magnitude and more persistent for firms with more severe governance and reporting failures, i.e., firms subjected to Securities and Exchange Commission (SEC)/Department of Justice (DOJ) investigations or shareholder lawsuits. Further supporting an active information gathering and processing role, negative pre-exposure trading imbalances manifest earlier in event time as investors' awareness of the broad issue increases, i.e., for *Late* firms whose alleged backdating practices are exposed more than six months after the WSJ's first article on option backdating in March 2006.

Second, we examine the short- and long-term profitability of institutional trades to assess their information content. Institutional trades in the month leading up to firm-specific media exposures are profitable, on average, both over short - i.e., when hypothetically reversed two days - and long horizons - i.e., when hypothetically reversed three months - after a firm's exposure. Thus, the direction of institutional trades predicts future price changes consistent with informed trading, while the absence of profit reversal at the longer horizon suggests that institutional trading activity does not destabilize the price formation process. Furthermore, consistent with institutions actively assessing backdating risk and anticipating the evolution of the scandal, their pre-exposure trades on *Late* firms are profitable earlier in event time and significantly more profitable than similarly timed trades on *Early* firms, i.e., whose alleged backdating practices are exposed within six months of the WSJ article.

Third, we examine institutional trading activities and profits conditional on the investors' likely informational advantage. To this end, we classify institutions in two groups for each

[3]Bernile and Jarrell (2009) find that aggregate institutional ownership of backdating firms decreases by the quarter-end following the first firm-specific news. However, the 13-F quarterly holdings data that they use do not allow for an examination of whether institutional investors anticipate firm-specific news or react to their public arrival. The actual trade data allows us to examine whether institutional investors can anticipate firm-specific exposures.

stock in our sample: *Local*, i.e., those located in the same state as the firm's headquarters, and *Non-Local*.[4]

Consistent with the notion that firm-investor proximity is associated with more informed trading (e.g., Coval and Moskowitz, 2001; Baik, Kang, and Kim, 2010), we find that local investors manifest negative pre-exposure trading imbalances earlier in event time, particularly for *Late* stocks. Moreover, pre-exposure local trades consistently earn higher profits than similarly timed non-local ones. This evidence implies that local institutional activities are both more informed and timely than the trading activities of non-local institutions and, thus, less likely to hamper market efficiency.

Overall, the patterns in pre-exposure aggregate institutional activities, especially of local investors, are consistent with informed trading. Next, in the spirit of Vega (2006), we analyze the role of institutional trading following the arrival of public information. Specifically, first, we test whether backdating exposures spill over onto institutional trades on "high-backdating-risk" stocks that are never implicated in the scandal (Carow et al, 2009). Independent of firms' actual involvement in the scandal, institutional abnormal trading imbalances on high-risk stocks become significantly negative as the frequency of firms exposed to have engaged in option backdating practices doubles in June-August 2006 compared to March-May 2006. This phenomenon, however, is fairly short-lived: while high-risk stocks that are ultimately implicated continue to experience negative imbalances during the following six months, Sept. 2006-Feb. 2007, non-implicated high-risk stocks experience no abnormal imbalance over the same period. Moreover, non-local investors *alone* account for any negative spillover and earn negative abnormal profits on the corresponding trades, in line with the earlier conclusion that the role of institutional trading depends on the investors' likely informational advantage.

In our last battery of tests, we examine whether institutional trading acts as a destabi-

[4]It is not obvious ex-ante that local investors should do better in this setting. While earlier studies of local performance of institutional investors that use holding snapshots (Coval and Moskowitz, 2001; Baik, Kang, and Kim, 2010) suggest that institutional investors possess some local advantage, studies examining more recent data find no evidence of this advantage in recent years, including during our sample period. For example, Bernile, Kumar, and Sulaeman (2011) report that investors do not earn superior returns on local holdings after the adoption of regulatory changes in early 2000s. Moreover, they also report that the excess holdings of local domestic stocks by U.S. institutional investors decline significantly following those regulatory reforms, beyond the secular declining pattern of local bias over time.

lizing force *after* the first arrival of firm-specific backdating news for stocks actually caught in the scandal. We find that institutional investors continue to display negative trading imbalances and their continued reaction is most pronounced when exposures are likely followed by more severe consequences, i.e., firms subjected to SEC/DOJ investigations or shareholder lawsuits. However, complementing our earlier inference, non-local institutions *alone* account for the continued negative post-exposure imbalances and, consistent with over-reaction, earn negative abnormal profits on the corresponding trades.

Our study provides several contributions to the literature. First, we add to the existing literature on the role and dynamics of institutional trading by providing the first analysis of actual institutional trades during a wave of corporate scandals. It is not obvious a priori whether the stylized facts from existing studies of other corporate events would be applicable in a setting like ours, given its non-recurring, largely unexpected nature, and the high uncertainty associated with its consequences. Indeed, our evidence that institutional traders as a group, particularly local ones, are able to anticipate the evolution of the backdating scandal of 2006-2007 is in contrast with the lack of such anticipatory role in other contexts documented by Griffin, Shu, and Topaloglu (2012) and Jegadeesh and Tang (2010) using datasets similar/identical to ours. Moreover, our setting allows us to examine the anticipatory trades of institutional investors in an information wave following a public event (i.e., WSJ coverage). This analysis is akin to examining the anticipatory trades of institutions around the start of other information waves, e.g., merger waves, which to the best of our knowledge has not been explored in the literature.

Second, our analysis adds to the arguably scant evidence on institutional trading around exposures of corporate misconduct. Theory suggests that institutional trading around governance failures reflects shareholders' optimal ex post incentives to punish management (Edmans and Manso, 2011). Consistent with this logic, a survey of institutional investors by McCahery, Sautner, and Starks (2010) indicates that 80% of respondents would 'vote with their feet', i.e., trade, to make their voices heard on governance matters.[5] While Karpoff and Lou (2009) find

[5]The idea that institutional investors may have an important direct governance role is long-standing (see, e.g., reviews by Shleifer and Vishny, 1997; Gillan and Starks, 2007). However, reviews by Karpoff (2001) and Gillan and Starks (2007) suggest that institutional activism may have little real effects on the targeted firms

that short-sellers do in fact identify and trade stocks of firms engaged in financial misreporting, it is not obvious that long-only institutions in our sample would have the same ability and/or incentives. Instead, institutions may have exerted their ex-post governance role predominantly by filing the large number of class-action and derivative lawsuits that targeted backdating firms. We provide direct evidence that institutional shareholders indeed exercise the threat of voting with their feet around perceived governance failures.

Lastly, intense media coverage of corporate scandals may contribute to unwarranted reactions by less informed investors. Joe, Louis, and Robinson (2009) find that, following the *BusinessWeek*'s (BW) publication of corporate boards' (in)effectiveness ratings, retail investors react to the negative information and fail to anticipate subsequent corrective actions, while institutions act as contrarian traders and provide liquidity for individuals' excessive selling. Their finding, however, is hard to generalize because the BW's ratings rely on surveys of institutional investors and, thus, convey a (much) weaker signal about the firms' governance quality to these investors. We find a consistent and more easily generalizable evidence that trading by less informed (i.e., non-local) institutions following media exposures of governance failures may fuel inefficient contagion and over-reaction.

The remainder of the paper proceeds as follows. The next section discusses the related literature and testable hypotheses. Section 3 presents the sample and data used in our analysis. Section 4 presents our empirical results, and Section 5 concludes.

2 Hypotheses Development

In this section we develop testable hypotheses related to the role of institutional investors during the backdating scandal of 2006-2007 in the backdrop of some discussion on the existing literature and the evolution of the scandal.

Stock-option backdating refers to the practice of selecting favorable *after the fact* dates to

(e.g., Karpoff, Malatesta, and Walkling, 1996). More recent studies, instead, highlight the indirect governance role that institutional investors may exert via the threat of ex post litigation (Cheng et al., 2009) or trading (e.g., Parrino, Sias, and Starks, 2003; Helwege, Intintoli, and Zhang, 2012; Chen, Harford, and Li, 2007).

fictitiously grant and report at-the-money stock option awards. Although it is estimated that as many as 29% of options grants were backdated in the years leading up to Sarbanes-Oxley (Heron and Lie, 2007), the practice was virtually unknown to the investing public prior to the WSJ's Pulitzer Prize-winning 'The Perfect Payday' article on March 18, 2006.[6] As Figure 1 shows, from that point on, the "backdating scandal" captured the attention of news media at least through the first quarter of 2007. Based on various sources we use to construct our sample - see next section, the number of companies publicly alleged to have engaged in option backdating grew from 13 (end of March 2006) to 89 (end of August 2006), to 168 (end of 2006), and finally tapered off reaching 198 (in June 2007). Over this period, the WSJ published tens of first-page stories on this issue and the business news media at large followed suit with a peak of 566 separate reports only in October 2006, reaching a grand total of 7,272 between January 2006 and December 2008. The initial surge in the number of companies publicly caught in the scandal was accompanied by increased attention of government agencies such as SEC, IRS, and DOJ. As shown in Figure 2, public records indicate that SEC officials started focusing publicly on the backdating issue in June 2006, with a peak in September 2006 and continued attention until mid-2007.

The existing evidence indicates that the media' and regulators' increased focus on backdating is associated with large, negative abnormal stock returns for firms caught in the scandal - around -9% on average (Narayanan et al., 2007; Bernile and Jarrell, 2009). No systematic evidence exists, however, that allows to draw inferences about the segments of the market that drove the documented patterns, nor about the role that different investors may have played with respect to the price formation process around these events. Using 13-F quarterly holdings data, Bernile and Jarrell (2009) find that aggregate institutional ownership of backdating firms decreases by

[6]Bizjak et al. (2009) and Heron and Lie (2007) find the first mention of option backdating is in a Buffalo News' lone article identifying the CEO and other executives of Natural Fuel Gas of backdating stock options. This article was published on March 18, 2001, incidentally exactly five years before the WSJ' one. After that, the SEC had announced investigations into option timing in 2004, but did not explicitly mention backdating. In 2004, an academic working paper by Erik Lie - later published in 2005 - was the first to suggest backdating as a viable explanation for the systematically favorable price patterns enjoyed by executives around their option grants' dates. Although a handful of news stories had mentioned the SEC investigation of backdating at Mercury Interactive starting in November 2005, it is fair to say that backdating became a widely known phenomenon as a result of and only after the WSJ article that brought it into the limelight in March 2006.

the quarter-end following the first firm-specific news. However, they do not attempt to identify whether institutional investors *anticipate* firm-specific news or *react* to their public arrival. The availability of actual trade data allows us to examine whether institutional investors can anticipate these news exposures.

Do institutional investors anticipate firm-specific backdating news?

Our first hypothesis (*H1*) posits that, if institutional trading is informed, then the resulting institutional imbalances, i.e., buy minus sell, should be abnormally low prior to firm-specific first exposures. This hypothesis is in contrast to recent studies that use similar/identical proprietary trade data to identify institutional activities and find no evidence of institutional trades anticipating corporate announcements. Using Nasdaq's transaction confirmation service data, Griffin, Shu, and Topaloglu (2012) analyze the role of institutional trading around firm-specific information events, such as takeovers and earnings announcements. They find that aggregate institutional trading cannot predict subsequent arrival of information, inconsistent with superior ability to gather or access value-relevant non-public information.[7] Moreover, Jegadeesh and Tang (2010) find no evidence of aggregate institutional trades anticipating takeover announcements using the same *ANcerno* dataset that we use.[8,9]

We also conjecture that the magnitude and timing of institutional trading should reflect both the nature of a firm's involvement in the scandal as well as the timing of its exposure. Specifically, if institutional investors have the ability to gather and trade on value relevant information, then their pre-exposure abnormal trading imbalances should be lower for likely

[7]In contrast, the institutional trades following earnings announcements in their sample earn positive profits and aggregate trading imbalances (i.e., buy minus sell volumes) predict subsequent long-term returns, consistent with institutions enjoying a comparative advantage in collecting, processing, and trading on public information.

[8]Puckett and Yan (2011) find that intra-quarter trading activities of institutional investors in the *ANcerno* dataset are persistently profitable, particularly among high information asymmetry stocks, consistent with the notion that these institutions act as informed traders during 'normal' times.

[9]Another common approach relies on algorithms that classify unidentified publicly available trading volumes. For instance, Campbell, Ramadorai, and Schwartz (2009) develop an algorithm to identify daily institutional volume from TAQ data and find that institutional investors correctly anticipate both earnings surprises and the post-earnings announcement drift, consistent with a superior ability to collect and process information around recurring firm-specific events. In a similar vein, Boehmer and Kelley (2009) use NYSE's Consolidated Audit Trail Data (CAUD) to infer daily institutional trading and conclude that trading by institutions plays a significant role in the improved informational efficiency of prices associated with greater institutional ownership, as previously suggested by Sias, Starks, and Titman (2006) and Sias and Starks (1997).

more severe backdating cases (*H1a*). Moreover, if institutional investors have the ability to extrapolate information (i.e., learn) from the publicly available history of backdating exposures, then their pre-exposure abnormal imbalances should be lower earlier in event time for stocks caught later in the wave of backdating exposures (*H1b*).

Do institutional investor pre-exposure trading activities disrupt market price formation?

To assess the role of institutional investors with respect to the price formation process during the backdating scandal, we examine the abnormal profitability of their scandal-related trades at various horizons. If institutional trading activities are primarily information-driven *and* do not disrupt the price formation process, then the risk-adjusted profitability of the underlying trades should be positive both over short and long horizons (*H2*).[10]

Moreover, similar to the logic above, we expect the profitability of institutional pre-exposure trades to depend on the likely severity of the backdating, as well as the timing of the firm-specific exposure. In particular, if pre-exposure institutional trades are informed, their abnormal profitability should be higher for likely more severe backdating cases (*H2a*) and manifest earlier in event time for stocks caught in the later wave of exposures (*H2b*).

Does the role of pre-exposure trading vary with likely access to information?

Conceptually, the role of institutional investors with respect to the price formation process should depend on the investors' likely access to value-relevant information. Available evidence indicates that institutions invest disproportionately in and enjoy superior performance on local stocks (e.g., Coval and Moskowitz, 1999, 2001; Baik, Kang, and Kim, 2010). Van Nieuwerburgh and Veldkamp (2009) show analytically that investor-firm proximity may in fact confer the investor a permanent information advantage, even if all investors have potential access to the same information.

[10] Alternative hypotheses are as follows. If institutional trades are information-driven *but* hamper efficiency by contributing to market prices' over-reaction, then abnormal trading profits may be non-negative in the short-run, but should decrease over longer horizons. If they are information-driven *but* require immediacy of execution (i.e., consume liquidity), then their abnormal trading profits may be negative in the short-run, but should increase and be non-negative over longer horizons.

In light of these arguments, we conjecture that the role of institutional trading during the backdating scandal varies with investors' proximity to the firm (*H3*). Specifically, *local* institutions should experience negative pre-exposure imbalances earlier in event time than *non-local* ones (*H3a*). Moreover, pre-exposure trades of local institutions should earn higher abnormal profits than similarly timed non-local trades (*H3b*). Since their trades respond to more timely and valuable information signals about subsequent backdating exposures, we expect that the trading activities of local institutions would not disrupt the price formation process .

Do institutional investors over-react to the public flow of backdating news?

The previous conjectures (*H1-H3*) focus on the information content of institutional trades ahead of firm-specific backdating exposures. However, previous studies document systematic patterns in institutional activities (e.g., positive-feedback trading and herding) that may destabilize market prices, particularly after the arrival of public information. Indeed, the wave of backdating news seems to have been anticipated as the scandal mounted (Bernile and Jarrell, 2009) and its effects to have spilled over onto high backdating risk stocks *never* actually implicated in the scandal (Carow et al., 2009).

To assess whether institutional trading has a destabilizing role during the scandal, we conduct two sets of tests. First, we test whether the effects of backdating news spill over onto institutional trades on stocks at high risk of being caught in the scandal, independent of their actual involvement. If such contagion occurs, then institutional trading imbalances on high risk stocks never involved in the scandal would mimic imbalances on stocks actually exposed (*H4*). Alternatively, institutions may learn from the evolution of the scandal and, thus, be better able to identify likely backdaters as the wave of backdating exposures unfolds. In this case, *H4* should hold predominantly during the first wave of backdating exposures, but not later on (*H4a*). Moreover, given the logic above, we conjecture that trades of more informed, i.e., *local*, investors are unlikely to fuel potentially inefficient contagion (*H4b*). Finally, if institutional activities on high risk stocks are informed, then the profitability of institutional trades should be higher for firms ultimately exposed (*H4c*) and more so for *local* trades (*H4d*).

Second, we test whether the first arrival of firm-specific backdating news prompts continued

(over-)reaction by institutional investors (*H5*). We conjecture that protracted post-exposure negative imbalances would be more prevalent when firm-specific exposures are more salient. In particular, we expect post-event imbalances to be larger when firm-specific exposures are likely followed by more severe consequences (*H5a*) and occur early in the wave of the backdating scandal (*H5b*). Moreover, following the logic above, we conjecture that the trading activities of less informed, i.e., *non-local*, institutions are more likely to fuel over-reaction to firm-specific backdating exposures (*H5c*), whereas post-exposure local trades should continue to be more profitable at short and long horizons (*H5d*).

3 Sample, Data, and Pre-scandal Characteristics

3.1 Sample and Data Sources

We obtain the sample of allegedly backdating firms from three separate sources: (1) the list last updated by WSJ's "Options Backdating Scorecard" website on September 4, 2007; (2) the "Yellow Card Trend Alert: Stock-Option Backdating Scandal" report last updated by Glass Lewis & Co (2007) on March 16, 2007; and (3) the list last provided by Dow Jones News Service on September 6, 2007.[11] This initial sample includes 279 unique firms.

To be included in the final sample, the firm must have: (i) at least one firm-specific backdating news story from an English-language news-source available on Factiva between January 1, 2006 to December 31, 2007; (ii) been traded at least once by *ANcerno*'s institutions during calendar year 2005; and (iii) price and return data in the Center for Research in Security Prices (CRSP) database.[12] Imposing these restrictions yields a final sample of 198 firms explicitly identified in public news stories as having potentially engaged in stock option grant backdating.

Complementing this set, there are 6,806 firms in the *ANcerno*'s set that are never associated

[11] The WSJ's list is available at http://online.wsj.com/public/resources/documents/info-optionsscore06-full.html; the GL's list is available at http://www.corporatecrimereporter.com/documents/glasslewis.pdf; finally, the DJNS's list is available on Factiva.

[12] *ANcerno* is a consulting firm that assists institutional investor clients (which include pension plan sponsors such as CalPERS and money managers such as Putman Investments) in monitoring their equity trading costs.

with the option backdating scandal. To conduct some of our tests, we estimate the likelihood that a firm is publicly identified as having engaged in option backdating practices conditional on ex-ante observable firm characteristics found to be significant determinants in earlier studies (e.g., Heron and Lie, 2009; Bizjak et al., 2009; Carow et al., 2009). The data requirements for this part of the analysis reduce the sample to 3,133 unique firms, 157 of which are associated with firm-specific backdating news between January 2006 and December 2007.

To identify the effective date on which a firm is caught in the scandal, following Bernile and Jarrell (2009), we use the first date on which any of the following news events becomes public: (1) Internal Review; (2) SEC Investigation; (3) DOJ Investigation; (4) Expect Restatement; (5) Delisting; (6) Lawsuit; (7) Executive or Director Departure; (8) Quantified Restatement; (9) SEC Exoneration; (10) DOJ Exoneration.

Our tests rely on institutional trading data provided by *ANcerno* Ltd. (formerly the Abel Noser Corporation).[13] One important feature of the *ANcerno*'s dataset is that it provides date-stamped signed trade (i.e., buy/sell) volumes for all executed trades, eliminating the need to rely on algorithms à la Lee and Ready (1991) to infer a trade's direction.[14] Equally important is the fact that execution prices and commissions of all trades are included in the dataset, allowing a precise estimation of trading profits. We use *ANcerno*'s data to construct the variables at the heart of our analysis: (a) total, buy, and sell trading volumes scaled by shares outstanding, and the resulting trading imbalances (i.e., scaled buy minus sell volume) for each stock-day; and (b) raw and abnormal profits for each trade.

We rely on standard data sources to construct predictors of the likelihood that a firm is publicly caught in the backdating scandal. In particular, using data from the last financial statements filed prior to January 2006 and available on Compustat, we measure equity market

[13] *ANcerno* is a widely recognized consulting firm that monitors equity trading costs of institutional investors such as CalPERS, Putman Investments, and Lazard Asset Management. Puckett and Yan (2011) provide a thorough and detailed description of this dataset, recently used in several leading academic publications on institutional trading. For sake of brevity, we refer the reader to their study for details about *ANcerno* data.

[14] The availability of actual trade data is particularly desirable in light of the evidence in Boehmer and Kelley (2009) and Campbell, Ramadorai, and Schwartz (2009). Boehmer and Kelley show that actual intra-quarter trading activities based on the NYSE's Consolidated Audit Trail Data are virtually uncorrelated with changes in 13-F institutions' holdings across consecutive quarters from 2000 to 2004. Similarly, Campbell et al. show that trading inferred from simple trade-size cutoff rules cannot explain quarterly changes in institutional holdings.

capitalization, book leverage, whether the firm pays any dividends, and the value of outstanding stock options. We use CRSP daily price data with *ANcerno*'s transaction data to compute trading profits, and separately to measure the daily volatility of firms' stock returns and the length of time firms have been listed on a major exchange (i.e., age). We obtain daily returns of the Fama-French 5x5 size and book-to-market matching portfolios from Ken French's website.[15] Finally, we retrieve analyst coverage data from Institutional Brokers' Estimate System (I/B/E/S) and 13(f) holdings from Thomson-Reuters Institutional Holdings Database. For the sake of brevity, we remand to Appendix Table A.1 for further details about the variables.

Some of our tests are based on the firm-investor proximity. For the purpose of this analysis, we collect from 13F filings the locations of portfolio managers in the ANcerno set. We then categorize the investor's trades as *Local*, when the firm headquarters is located in the same state as the investor, and *Non-Local*, otherwise. The majority of portfolio managers in ANcerno are U.S.-based and we are able to match the location of nearly 80 percent of their trades.

3.2 Pre-scandal Trading Activities and Firm Characteristics

Table 1 provides summary statistics for all variables in our analysis measured during or as of the end of 2005, after we partition the sample into *Backdating* and *Non-Backdating Firms*. For each group, panel A reports the summary statistics of the daily trading activities in the *ANcerno* dataset measured during 2005; Panel B reports similar statistics for firm-level characteristics that we use as predictors of the likelihood that public news stories may associate a firm with the option backdating scandal.

Panel A indicates that, during 2005, the mean (median) firm-level daily trading activity - i.e., scaled total, buy, or sell volumes - of ANcerno institutions is more than twice (four times) for backdating firms than non-backdating firms. In both samples, however, the typical daily institutional trading imbalance is marginally positive and one cannot reject the hypothesis of no differences in net daily trade volumes across the two samples. In subsequent analysis, we adopt the 2005's firm-level time-series means of institutional trading measures as our benchmarks to

[15] At http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/ftp/25_Portfolios_5x5_Daily.zip

test whether institutional trading activities change significantly during the backdating scandal.

The cross-sectional sample statistics in Panel B show that, prior to the scandal, backdating and non-backdating firms are significantly different along various dimensions, also in line with the heavier institutional trading activities for the former group. Indeed, at the end of 2005, both mean and median total institutional holdings of firms caught in the scandal are larger, whether we include all institutions or only institutional blockholders, i.e., those holding at least a 5% stake. These firms are also larger and older, more heavily followed by analysts, more likely to be part of the S&P500 index, and less likely to pay dividends.[16] Moreover, although backdating firms rely less on financial leverage, on average, they also have more volatile equity returns. This is due to the operating characteristics of firms caught in the scandal, which are more likely to be from high-tech industries as defined by Heron and Lie (2009), 22% versus less than 9% for non-backdating firms. Finally, perhaps unsurprisingly, the mean (median) value of outstanding stock options as a fraction of common equity capitalization is significantly higher, almost 50%, in the backdating sample prior to the scandal.

4 Empirical Results

In this section we discuss the empirical methods used to test our hypotheses and the resulting evidence. Subsection 4.1 presents the empirical evidence regarding the role of institutional trading in *anticipation of* firm-specific backdating exposures (*H1-H3*). In Subsections 4.2 and 4.3, we discuss the evidence concerning the *spill over* of backdating news onto institutional trades on high risk stocks never implicated in the scandal (*H4*) and the role of institutional trading in *reaction to* the first arrival of firm-specific backdating news (*H5*), respectively.

[16]These characteristics are consistent with stylized facts on the determinants of institutional ownership - see, for instance, recent evidence in Yan and Zhang, 2009).

4.1 Role of Institutional Trading Prior to Backdating Exposures

4.1.1 Institutional Trading Imbalances Prior to Backdating Exposures

We begin our analysis using an event study approach to test whether institutional investors display abnormal trading activities in anticipation of firm-specific backdating exposures. To this end, for each firm in the backdating sample, we separately aggregate daily institutional buy and sell volumes and compute the resulting trading imbalances, all scaled by shares outstanding, for each trading day in the relevant firm-specific event-window. Then, for each daily trading measure, we compute mean abnormal institutional daily trading activity as:

$$AVOL = \sum_{i=1}^{N} \frac{1}{N} \sum_{t=k}^{k+T} \frac{1}{T} (VOL_{it} - Benchmark_i) \tag{1}$$

where VOL_{it} is the trading volume measure (i.e., scaled aggregate buy, sell, or buy minus sell volume) of stock i on event day t, with $t = 0$ on the first firm-specific backdating news' date as previously defined; $Benchmark_i$ is the time-series mean of stock i's daily institutional trading metric during calendar year 2005; N is the number of sample firms and T is the number of trading days contained in the relevant event-window, $[k, k + T]$.

Table 2 reports the mean abnormal daily institutional trading prior to firm-specific backdating exposures for various pre-exposure windows and subsamples. To assess *H1*, Panel A reports mean daily scaled volumes for the whole sample of firms having at least one identifiable backdating-related news story. Mean daily abnormal buy volumes are negative across all pre-exposure windows and significant at conventional levels starting in the $[-60, -21]$ window. The pattern for abnormal sell volumes is more erratic. On average, institutional sell volumes are abnormally low around the same time when abnormal buy volumes too become significantly negative - i.e., $[-60, -21]$ window - suggesting a broader reduction in overall institutional trading activities. On the day of the exposure, institutional abnormal sell volumes are positive and significant, both statistically and economically. Specifically, the evidence indicates that daily sell volumes nearly double on the exposure day compared to the typical 2005 daily level - approximately 0.075%, see Table 1.

Following prior studies, our tests focus on the resulting trading imbalances as a measure of investor trading activities around backdating exposures. Abnormal buy minus sell volumes are consistently negative prior to firm-specific exposures and mostly statistically and economically significant. Indeed, our sample institutions accumulate 1% less of the exposed firms' outstanding shares than they would have in the benchmark period (i.e., 0.71%=0.0059%*121), resulting in a net reduction of their holdings of backdating firms. The evidence, thus, rejects the null hypothesis of no abnormal trading and supports the notion that institutional trading prior to backdating exposures reflects information about their negative wealth effects.

In untabulated tests, we conduct a robustness analysis to control for potential market-wide and/or firm-related news that takes place in the same window. To control for firm-related news, we obtain a matching sample of firms with similar trading pattern in the benchmark period and yet do not have a high probability of experiencing firm-specific backdating events. In particular, for each firm experiencing backdating news, we find a matching non-event firm that satisfies the following criteria: (1) is in the lowest quintile of ex-ante probability of experiencing a backdating event[17], and (2) has the highest correlation with the backdating firm in terms of residual buy-sell imbalance in the benchmark period[18]. We then examine the matching firms in the same window as the backdating firms to control for potential market-wide trading imbalance. Supporting our base inference, we observe no significant imbalance for the matching firms during the pre-event window, consistent with *H1*.[19]

In Panel B of Table 2, we test whether institutional trading imbalances are more negative when firms' backdating exposures are likely to reveal more severe governance and reporting issues (*H1a*). To conduct this test, we segment the sample firms based on the amount of scrutiny that outsiders exert on the firm following its exposure and the result of such scrutiny.

[17]We describe the probability model in more details in the next section.

[18]We follow the analysis in Kumar and Lee (2006) and regress daily BSI of each stock on daily excess market return to obtain residual buy-sell imbalance that is orthogonal to the market factor. We then examine the correlation of each potential matching firm with the sample firms and choose the firm with the highest correlation. The median correlation of the residual BSI in the benchmarking period between the event sample and the matching sample is 0.87.

[19]The results of this untabulated analysis are available upon request. The results in Figure 3 and Panel C of Table 6, and the associated discussion in section 4.2.1 provide additional evidence that our results are not driven by market-wide trends in trading imbalances.

In particular, *SECDOJ or Lawsuit* contains 137 firms subject of SEC or DOJ investigations without subsequent exoneration or of shareholder class-action/derivative lawsuits, whereas the *No* sample includes 29 firms receiving SEC or DOJ exoneration notice or facing no shareholder lawsuit and conducting no internal investigation and not subject of SEC or DOJ investigation.

The evidence shows that firms likely to suffer more severe consequences following backdating exposures experience significantly negative daily abnormal trading imbalances starting three weeks prior to the first firm-specific news. By contrast, firms that news media generically associate with backdating during the scandal period experience trading imbalances that are not significantly different from their 2005 levels throughout the pre-event windows. The statistically and economically significant differences across the two samples support *H1a* and suggest that institutional trading imbalances in anticipation of firm-specific exposures reflect information about the likely severity of the underlying misconduct and its consequences.

In Panel C of Table 2, we test whether the (event-) timing of institutional trading imbalances prior to backdating exposures depends on the timing of the first firm-specific news relative to the overall evolution of the scandal (*H1b*). To test this hypothesis, we segment the first firm-specific exposures in two groups by calendar time: *Early Exposure* for events on or before August 31, 2006 vs *Late Exposure* for events afterwards. We choose this date because it corresponds to roughly six months after the WSJ's article that prompted the public scrutiny on option granting practices and, thus, our earliest pre-event window. If institutions learn from the evolution of the scandal, their trading imbalances should anticipate firm-specific exposures earlier in event time for the later wave of exposures (*H1b*).

The evidence in Panel C supports this hypothesis. First, *Late Exposure* firms experience statistically significant negative abnormal imbalances earlier in event time than *Early Exposure* ones. *Late Exposure* firms experience significant cumulative abnormal imbalances of -0.5% (-.0081%*60) in the window $[-120, -61]$, representing over 65% of this group's cumulative abnormal imbalance over the entire $[-120, 0]$ window. Although not statistically significant, *Early Exposure* firms in fact experience positive abnormal imbalances over the same pre-event window - which for most of these firms spans periods prior to the WSJ's March 2006 article.

Starting in the window $[-60, -21]$, institutional abnormal imbalances of *Early Exposure* firms tend to be significantly larger in magnitude than those of *Late Exposure* ones, and increasingly so as the firm exposure date approaches.

4.1.2 Profitability of Institutional Trades Prior to Backdating Exposures

To assess the role of institutional trading with respect to the price formation process (*H2*), we examine the profitability of pre-exposure institutional trades at various post-exposure horizons. Specifically, we assume all pre-exposure trades are reversed at the close of 1 or 60 trading days after the corresponding firm-specific exposures, $t = 0$.[20] We estimate institutional trades' abnormal profits as follows. First, for each transaction in the database, we compute its raw percentage profit as:

$$Profit_{i,k,t} = I * 100 * \frac{(Price_t - TransactionPrice_k)}{TransactionPrice_k} \tag{2}$$

where I is an indicator variable equal to 1 for buys and -1 for sells; $Price_t$ is the closing price of the stock as recorded in CRSP on trading day t after the transaction date k, adjusted for stock splits and dividends since k; and $TransactionPrice_k$ is the price at which the transaction is executed on date k as recorded in the *ANcerno* database. Then, to estimate the transaction abnormal profit, we subtract from (2) the product of I and the buy-and-hold return on the Fama-French size and book-to-market matched portfolio over the same $[k, t]$ window.

Panel A of Table 3 reports transaction value-weighted mean abnormal (%) profits of institutional trades executed over various pre-exposure trading windows. The mean dollar transacted in the trading month prior to firm-specific backdating exposures earns a statistically significant positive abnormal return, which increases with the liquidation horizon from 0.72% to 1.64% (when the positions are reversed 60 trading days after the event). Thus, supporting *H2*, the evidence indicates that institutional trades in the month preceding firm-specific exposures are consistent with information-driven activity. When we extend the trading window back in event-time, the evidence becomes more erratic and arguably harder to interpret in light of the

[20] In unreported analysis, we use 20 trading days and obtain consistent results.

evolution of the backdating scandal. Nonetheless, a systematic pattern emerges when comparing profits across trading windows: institutional trades executed closer to the exposure events are more profitable, consistent with more informed trading.

To gain further insights on the role of institutional trading activities, similar to earlier tests, we segment backdating exposures based on their likely severity or on their timing relative to the evolution of the scandal. Panel B of Table 3 reports mean abnormal profits of institutional pre-exposure trades on stocks in the *SECDOJ or Lawsuit* and *No* subsamples. Consistent with informed trading, on average, pre-event trades in the month leading to first firm-specific backdating news earn positive and significant abnormal profits both at short and long liquidation horizons in the subsample of more severe cases. In contrast, the mean abnormal profits are significantly negative in the other sample over the same trading window and liquidation horizons. Consistent with *H2a*, the differences across the two samples are statistically significant at conventional confidence levels.

Panel C of Table 3 presents mean abnormal profits of institutional trades on stocks in the *Early Exposure* and *Late Exposure* subsamples. We conjecture that trading profits should vary with the timing of firms' exposures relative to the overall scandal, if the trades reflect institutions' learning and, thus, better timing as the scandal progressed. Consistent with the evidence in Panel A, the profitability of institutional trades in the month prior to exposure events is positive for both groups of firms, regardless of the liquidation horizon. Yet, consistent with learning, mean trade profitability for *Late Exposure* stocks in the $[-20, -1]$ window is significantly higher than for *Early Exposure* ones. Moreover, complementing the inference based on trading imbalances, institutional pre-exposure trades earn positive mean abnormal profits earlier in event time for *Late Exposure* stocks, and the differences in profitability across the two samples are significant regardless of the trading window and liquidation horizon. Overall, supporting *H2b*, the evidence indicates that pre-exposure institutional trading becomes more profitable as investors learn about the scope and severity of the backdating scandal.

The inference based on the baseline event-time analysis above may be affected by the clustering of backdating exposures over the 2006-2007 period. To check for robustness, we perform

a calendar-time portfolio analysis. We begin by creating a daily list of stocks that satisfy the following requirement: the firm-specific first backdating news event happens within the subsequent 20 trading days or on that day or on the previous day. Then, we generate a daily "buy" portfolio consisting of all stocks on this daily list, with each stock's portfolio weight equal to the total dollar buy volume on the stock on that day and the previous 20 trading days. Similarly, we generate an equivalent daily "sell" portfolio, with weights based on total dollar sell volumes. Finally, we calculate the daily return to the zero-cost hedge portfolio that is long the "buy" portfolio and short the "sell" portfolio. Since all stock returns are aggregated each day into one hedge portfolio return, the series of daily portfolio returns are not affected by changes in market conditions and/or clustering of backdating news events.

Panel D of Table 3 reports the time-series mean of the hedge portfolio daily returns for the whole sample, the *SECDOJ or Lawsuit* subsample, and the *Late Exposure* subsample. The main inferences remain unaffected: institutional trades executed in the month leading to backdating exposures are profitable, on average. Again, in the subsamples of more severe cases or late exposures, pre-event trades are associated with more positive and significant abnormal returns. We also allow stocks to stay on the daily list if the first firm-specific backdating news happens during the previous 60 trading days, while still requiring trades to be executed in the [-20,-1] event window. The results reported in the last column of Panel D show that our inferences and the magnitudes of abnormal returns remain unchanged when we assume a longer holding horizon.

In sum, the evidence in Table 3 is consistent with informed trading by institutional investors. Moreover, we find that the information content of pre-exposure institutional trades increases with the severity of the subsequent firm-specific news or after investors have a chance to learn about the scope of the broader scandal. Finally, we find no systematic evidence that institutional trading disrupts the price formation process prior to firm-specific backdating exposures.

4.1.3 Does the Role of Institutional Investors Vary with Access to Information? Effect of Geographic Location

In this subsection, we examine whether the role of institutional trading around backdating exposures depends on the investors' likely informational advantage (*H3*). More precisely, we conjecture that the information content of institutional trades should increase with firm-investor geographical proximity (see, e.g., Coval and Moskowitz, 1999, 2001; Baik, Kang, and Kim, 2010). To conduct our tests, we classify trades in the *ANcerno* set into two groups for each stock: *local*, i.e., trades of portfolio managers located in the same state as the firm's headquarters, and *non-local*. Tables 4 and 5 summarize the evidence from these tests.

Table 4 reports mean abnormal daily trading imbalances of local and non-local institutions over various pre-exposure windows. We perform the analysis for the whole sample of backdating firms, Panel A, or separately for *SECDOJ or Lawsuit* or *Late Exposure* firms, Panels B and C, respectively. Supporting *H3a*, Panel A shows that local investors experience significantly negative pre-exposure abnormal imbalances earlier in event time than non-local ones. Moreover, in line with earlier evidence, we find that the differences in pre-exposure trading activities across investors are particularly prominent for the *Late Exposure* subsample, Panel C. This is consistent with the idea that local traders are better able to exploit information about the broad evolution of the scandal to (privately) identify backdating firms yet to be tainted.

Table 5 reports transaction value-weighted mean abnormal (%) profits of local and non-local trades executed over various pre-exposure windows. As before, we assume that trades are reversed either: one trading day, Panel A, or 60 trading days, Panel B, after the first firm-specific backdating news. As in Table 4, we perform the analysis for the whole backdating sample, and separately for *SECDOJ or Lawsuit* or *Late Exposure* firms only. Across trading windows, liquidation horizons, and targeted stocks, we find that local pre-exposures trades earn positive mean abnormal profits that are significantly higher than similarly timed non-local trades. Supporting *H3b*, this evidence suggests that local investors enjoy an informational advantage. The absence of reversal when the liquidation horizon is extended to 60 trading days suggests that information-based local trades do not disrupt the price formation process.

Furthermore, consistent with the tenet of *H3*, the excess profitability of local trades is higher when subsequent firm-specific backdating exposures are more salient, i.e., *SECDOJ or Lawsuit* in Panels A2 and B2, or investors can exploit information about the broad evolution of the scandal to (privately) identify backdating firms yet to be tainted, i.e., *Late Exposure* in Panel A3 and B3.

4.2 Is there Backdating News Contagion across Institutional Trades?

The evidence to this point indicates that institutional trading activities *anticipate* value-relevant information about subsequent firm-specific backdating exposures. This is especially true when the underlying corporate misconduct is likely more salient or when public awareness of the broader scandal is likely higher. The latter finding, in particular, suggests that institutions exploit information about the evolution scandal to (attempt to) identify firms likely to have engaged in backdating practices ahead of firm-specific news. In this section, we address a question naturally related to these findings: do backdating news spill over onto institutional trades on stocks *never* associated with option backdating, consistent with over-reaction to public information about the scope of the scandal?

To address this question, we begin by estimating a simple Probit model of the likelihood that a firm is caught in the backdating scandal conditional on ex ante observable characteristics. We take the lead from existing studies of backdating events to select a set of firm characteristics shown to co-vary with the occurrence of firm-specific backdating news (Narayanan et al., 2007; Bernile and Jarrell, 2009; Bizjak et al., 2009; Heron and Lie, 2009; Carow et al., 2009). In particular, we focus on variables arguably easy-to-observe/retrieve for investors in our sample. The model coefficient estimates, marginal effects, and associated test statistics are reported in Appendix Table A.2. Then, for each firm, we use the model estimates to predict the (ex-ante) likelihood that the firm is publicly alleged to have engaged in backdating. Finally, we partition sample firms into quintiles after ranking the predicted probabilities from low ($Q1$) to high ($Q5$).

While a detailed discussion of the model is beyond the scope of this paper, some observa-

tions are noteworthy.[21] First, as previously noted, the sample size shrinks notably due to data constraints. Second, several of the model coefficient estimates are statistically significant at conventional levels. Third, some of the marginal effects are economically large compared to the unconditional probability of backdating exposures, approximately 5%. Therefore, notwithstanding its naiveté - which we view as desirable, the model captures some of the systematic variation in backdating exposure occurrences.

4.2.1 Institutional Trading Activities on High Backdating Risk Stocks

Our analysis in this section mostly focuses on firms in the high backdating risk ("high risk", henceforth) quintile, *Q5*. Nonetheless, it is informative to compare abnormal institutional trading imbalances across the extreme backdating likelihood quintiles (*Q1* and *Q5*). Figure 3 plots mean daily abnormal trading imbalance differentials between *Q1* and *Q5* for each month between January 2006 and December 2007. The mean differential, *Q5-Q1*, is negative (and statistically significant at least at the 10% level) in 18 (11) out of the 21 months that follow the WSJ's 'The Perfect Payday' article in Mar. 2006. By contrast, over the same period, there is only one month (i.e., Feb. 2007) when the differential is positive and significant. These differences in institutional imbalances are in line with the idea that the wave of backdating news affected institutional investors' trading strategies and dispel the notion that the imbalances associated with backdating news simply reflect market-wide trends.

In the remaining analysis, we investigate in greater detail the institutional trading activities on high risk stocks, *Q5*. This analysis is conducted in calendar (trading) time, with $t = 0$ on March 18, 2006, the day the WSJ began its investigative series on option backdating. Table 6 reports mean abnormal daily imbalances for all high risk stocks, Panel A, and separately for high risk stocks actually, *Q5-Already/Later*, or never, *Q5-Never*, involved in the backdating scandal, Panels B and C, respectively.

Panel A reports mean daily abnormal institutional trading imbalances over various trading windows following the inception of the scandal for all high risk stocks, *Q5*. Consistent with

[21] We refer the reader to the papers cited in the main text for a thorough discussion of issues related to the likelihood that firms engage in option backdating practices and are subsequently identified as having done so.

Figure 3, high risk stocks experience negative mean abnormal imbalances starting in the three months after the 'The Perfect Payday' article and persisting for up to a year. The mean imbalances, however, are economically large and statistically significant only at the height of the scandal, $[61, 120]$, when the fraction of companies ultimately exposed went from approximately 20% to 60% and the scope of the scandal became more apparent - see also Figures 1, 2, and 3.

Panels B and C of Table 6 report mean abnormal imbalances separately by firms' ultimate involvement in the scandal: those eventually caught in the scandal, *Q5-Already/Later*, and those never publicly associated with option backdating practices, $Q5-Never$, respectively. For stocks ultimately caught in the scandal, *Q5-Already/Later*, mean abnormal imbalances are negative and significant throughout the first trading year. For the *Q5-Never* sample, instead, abnormal imbalances are negative and significant *only* at the height of the scandal - i.e., $t \in [61, 120]$. Therefore, when the intensity of exposures is at its peak, we find evidence consistent with negative spillover across high risk stocks (*H4*). Past this period, any spillover effect seems to subside, as institutional trading activities more accurately target high risk stocks ultimately caught in the backdating scandal, consistent with *H4a*. Incidentally, the lack of evidence in Panel C also confirms that the documented imbalances for backdating firms do not simply reflect market-wide trends.

In Table 6, we also examine separately the trading activities of *local* and *non-local* institutional investors following the WSJ article. We find that local institutions' abnormal imbalances are negative and significant *only* for *Q5-Already/Later* stocks, while non-local institutions' abnormal imbalances are negative and significant for *Q5-Never* stocks during the first six months following the WSJ's 'The Perfect Payday' article. Thus, supporting *H4b* and complementing earlier results, the evidence suggests that trading of local institutions is unlikely to fuel potentially inefficient spillover effects onto non-implicated high risk stocks.

4.2.2 Profitability of Institutional Trades on High Backdating Risk Stocks

In this section, we analyze the information content of institutional trades on high risk stocks during the scandal. In line with earlier tests, we assess institutional trades' abnormal profits at

short and long liquidation horizons to draw inferences about the potential impact of institutional trading activities on the price formation process. Table 7 summarizes the results of this analysis for all high risk stocks, Panel A, and separately for high risk stocks actually, *Q5-Already/Later*, or never, *Q5-Never*, involved in the backdating scandal, Panels B and C, respectively.

In Panel A, we find that, at the onset of the scandal, i.e., $t \in [1, 60]$, institutional trades' abnormal profits on high risk stocks are positive and relatively large independent of the liquidation horizon. During the next year or so, i.e., $t \in [61, 350]$, as the media coverage of the scandal and the number of exposed firms increases, institutional trading profits remain positive at both liquidation horizons, but are notably weaker. Overall, the results are consistent with informed institutional trading for stocks at a high risk of being involved in the backdating scandal.

Although we observe similar patterns in the profitability of institutional trades in the *Q5-Already/Later*, Panel B, and *Q5-Never* partitions, Panel C, some differences are noteworthy. Consistent with *H4c*, across all trading windows, the mean abnormal profits of institutional trades in the *Q5-Already/Later* sample are significantly higher than for other high risk stocks and the differences are economically large. Most notably, in line with our earlier inference about the spillover of backdating news at the peak of the scandal, i.e., $[61, 120]$, we find evidence of marginally negative profits in the *Q5-Never* sample, while trades on *Q5-Already/Later* stocks continue to be significantly profitable.

To gain further insights, in Table 7, we also segment the sample by investors' likely information advantage, i.e., *local* and *non-local* trades. The evidence suggests that local trades have consistently higher information content than non-local ones across all trading windows, and the differences are statistically significant and economically large. Consistent with *H4d*, the differences between local and non-local profits are larger for trades on high risk stocks eventually caught in the scandal, *Q5-Already/Later*. Finally, to the extent that institutional trading fuels inefficient contagion of backdating news across high risk stocks, this seems limited to trades executed at the peak, i.e., $t \in [61, 120]$, of the scandal (*H4a*) by the less informed, i.e., non-local, institutions (*H4b*). Except for this segment of investors during the 'backdating frenzy', however, the evidence widely supports the notion that institutional trading activities

on high risk stocks during the backdating scandal are informed and rational.

4.3 Post-Event Trading Activities and Profitability

Institutional trading activities may hamper efficient market formation process if they fuel an *excessive* reaction to the arrival of firm-specific news (*H5*). To assess this possibility, in this section, we analyze institutional trading imbalances and profits *after* firm-specific backdating exposures. We hypothesize that a continued institutional reaction to firm-specific exposures should be larger when the exposures are more salient/severe (*H5a*), early in the evolution of the backdating scandal (*H5b*), and among less informed, i.e., *non-local*, institutions (*H5c*). To the extent that institutions fuel inefficient over-reaction to firm-specific exposures, we expect non-local ones to be the primary (or exclusive) driver of such destabilizing activity (*H5d*).

Table 8 reports mean abnormal daily trading imbalances following the firm-specific first exposures across all institutions, in Panel A. It also presents mean abnormal imbalances by the likely salience of the backdating exposures, in Panel B, by their timing relative to the broader scandal, in Panel C, and by firm-investor proximity, in Panel D. Consistent with the general tenor of *H5*, there is evidence in Panel A of protracted abnormal institutional trading for up to two weeks after the first arrival of firm-specific backdating news, i.e., $t \in [1, 10]$. Specifically, supporting *H5a*, we find that the continued institutional reaction to firm-specific exposures is statistically and economically larger when the exposure is likely more salient, Panel B. In fact, consistent with the pre-exposure results and informed trading, we find no evidence of abnormal institutional trading activities for firms subsequently exonerated. Moreover, although only the abnormal imbalances on *Early Exposure* stocks continue to be negative for up to two weeks in line with *H5b*, the differences in Panel C are not statistically significant. Finally, the evidence in Panel D suggests that only the activity of less informed, i.e., non-local, institutions fuels protracted and potentially destabilizing reactions to firm-specific exposures (*H5c*).

To assess the potential impact of post-exposure institutional trades on the quality of market prices, we examine their profitability over the duration of the backdating scandal. Table 9, whose structure is similar to Table 8, reports transaction value-weighted mean profits of trades

executed during the 20 trading days after firm-specific exposures. In Panels A through C, we find that post-exposure institutional trades consistently earn negative abnormal profits when liquidated at the longest horizon. This is consistent with the notion that post-exposure institutional trading has lower information content and may destabilize market prices by fostering over-reaction to firm-specific backdating news.

However, consistent with *H5d*, the evidence in Panel D shows that the trades of less informed, i.e., non-local, investors *exclusively* account for the aggregate negative abnormal profits. Thus, in addition to our inference concerning *H5c*, it appears that protracted post-exposure activities of non-local institutions can disrupt the price formation process following the arrival of firm-specific backdating news. Conversely, post-exposure local trades continue to earn small, but positive abnormal profits. Together with the results in Panel D of Table 8, this evidence suggests that local institutional trading activities may facilitate the post-exposure price formation process by partially absorbing excessive trading of less informed non-local investors.

5 Summary and Conclusions

There is an ongoing debate about the role of institutional investors in capital markets and, in particular, whether they are informed and how their trading activities affect the price formation process in the market. This paper presents the first systematic analysis of institutional trading patterns and performance around exposures of corporate governance and reporting failures, a desirable testing ground given the large uncertainty surrounding these events.

Existing studies show that market participants view backdating exposures as negative information events. We document for the first time that aggregate institutional imbalances (buys minus sells) are abnormally negative in *anticipation of* firm-specific exposures, consistent with informed trading. Moreover, the pre-exposure imbalances are larger in magnitude and more persistent when subsequent exposures are more salient. Also, suggestive of 'learning', pre-exposure abnormal imbalances begin to manifest earlier ahead of firm-specific news for stocks caught in the later wave of exposures.

Consistent with informed trading that does not disrupt the price formation process, institutional trades in the month leading up to firm-specific exposures are profitable both at short and long post-exposure horizons. The timeliness and information content of institutional trades, however, vary with investors' likely information advantage. Indeed, more informed, i.e., *local*, institutions display negative pre-exposure abnormal imbalances earlier and earn higher profits than *non-local* institutions.

While institutional investors' anticipation of firm-specific news is consistent with informed trading that may improve efficiency, we also find that institutional trading may disrupt the price formation process in reaction to the arrival of backdating news. Namely, there is evidence that institutional trades contribute to over-reaction to actual exposures and to unwarranted spillover of backdating news onto unimplicated high risk stocks. Nonetheless, these short-lived patterns are exclusively due to the trading activities of non-local institutions and partially absorbed by more informed local institutions. Collectively, the evidence is largely consistent with informed trading by institutional investors that does not disrupt the price formation process during the wave of exposures of option backdating practices.

Our analysis of firm-specific exposures within the broader backdating "wave" also indicates that, when analyzing institutional investors' role, it may be important to distinguish firm-specific isolated events from firm-specific news that have implications for wider segments of the market. If events of the latter type foreshadow unfolding waves of related news, institutional investors could be better suited to identify and anticipate them - i.e., "ride the wave" - due to a greater availability of expertise and resources. Then, the role of institutional investors would depend crucially on the pervasiveness and broader implications of firm-specific events, and the effects of their trades with respect to market efficiency would extend beyond just those on the stock experiencing a particular event. We believe this is an interesting line of inquiry that may prove fruitful in future research.

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Appendix Table A.1 – Variable Definitions

Variable	**Definition**
Trading Volume Measures	
VolInst	Daily institutional total (buy plus sell) volume as a percentage of the latest number of shares outstanding
VolInstBuy	Daily institutional buy volume as a percentage of shares outstanding
VolInstSell	Daily institutional sell volume as a percentage of shares outstanding
VolInstImbal	*VolInstBuy* minus *VolInstSell;* daily institutional trading volume imbalance as a percentage of shares outstanding
Profit/Return Measures	
Trading Profit (%)	For buys, 100^{*}(CRSP Price $_{[+t]}$ - *ANcerno* Buy Price) / *ANcerno* Buy Price, adjusted for stock splits and dividend distributions; For sells, 100^{*}(*ANcerno* Sell Price - CRSP Price $_{[+t]}$) / *ANcerno* Sell Price, adjusted for stock splits and dividend distributions
Abnormal Trading Profit (%)	Trading profit in excess of buy-and-hold return of Fama-French matching 5x5 portfolio based on market value of equity and ratio of book value of equity to market value of equity as of December 2005
Daily Calendar-Time Buy-Sell Portfolio Return (%)	The average daily return of principal-weighted daily portfolio of all buy trades in the [-20,-1] event window on stocks for which the first firm-specific backdating news event happens within the subsequent 20 trading days or on that day or on the previous day, minus the average daily return of the corresponding principal-weighted daily portfolio of all sell trades in the same window on the same stocks.
Firm Characteristics	
BackdateDum	Indicator variable equal to 1 if there is public release of firm-specific backdating news, and zero otherwise
Benchmark Mean$_i$	Calendar year 2005 time-series mean of stock *i*'s daily institutional trading activity as a percentage of shares outstanding (*ANcerno*)
Benchmark Std$_i$	Calendar year 2005 time-series standard deviation of stock *i*'s daily (scaled) institutional trading activity
LogSize	Natural log of equity market capitalization (Compustat: item 25*item 199) as of the fiscal year ending in 2005
LogAge	Natural log of number of years since firm's first appearance on CRSP database as of the fiscal year ending in 2005
Leverage	Ratio of total book debt to total book assets (Compustat: (item 9 + item 34)/item 6) as of the fiscal year ending in 2005
Dividend Payer	Indicator variable equal to 1 if firm pays cash dividends to common shares (Compustat: item 21) as of the fiscal year ending in 2005
Option	Value of stock options outstanding at year-end (Compustat: OPTOSEY / item 25) as of the fiscal year ending in 2005
Stock σ	Annualized stock return daily volatility during prior 5 years as of the fiscal year ending in 2005
LogAnalysts	Natural log of one plus number of analysts making fiscal year-end earnings forecasts as reported in I/B/E/S as of the fiscal year ending in 2005
Blockholding	Total % ownership of 13F filers with at least 5% stake each as of the fiscal year ending in 2005
Institutional Ownership	Total % ownership of 13F filers as reported at end of previous quarter as of the fiscal year ending in 2005
S&P 500	Indicator variable equal to 1 if firm included in the S&P500 as of the fiscal year ending in 2005
High Tech	Indicator variable equal to 1 if SIC code between 7370-7379 (Heron and Lie, 2009) as of the fiscal year ending in 2005
Backdating Likelihood Quintile	Quintile rank of firm-level predicted probability of backdating from logistic regression estimates (Table A.2), with rank 1 corresponding to the lowest probabilities of backdating, and 5 corresponding to the highest probabilities

Appendix Table A.2 – Determinants of Firm-specific Option Backdating News Likelihood.
This table reports logistic regression estimates of the determinants of firm-specific option backdating news. The sample includes 3,133 unique firms in the *ANcerno* database between 2006 and 2007, among which 157 are associated with firm-specific news concerning the option backdating scandal during the same period on Factiva. The dependent variable is *BackdateDum* as defined in Table A.1. All independent variables are measured as of the fiscal year ending in calendar year 2005. Robust standard errors are reported in parentheses. The column *Marginal Effect* reports the predicted change in the probability of backdating news given a one standard deviation increase in the corresponding continuous variable or a unit increase in the corresponding indicator variable, holding all other variables constant at their means. Superscripts [a], [b], and [c] denote statistical significance at the 1%, 5%, and 10% levels, respectively. Table A.1 provides details on variable definitions and data sources.

	Coefficient	(Std. Error)	*Marginal Effect*
Intercept	-9.89[a]	(0.83)	
LogSize	0.15	(0.11)	*0. 55%*
LogAge	0.28[b]	(0.14)	*0.58%*
Leverage	-0.40	(0.45)	*-0.18%*
Dividend Payer	-0.57[b]	(0.28)	*-0.61%*
Option	6.40[a]	(1.35)	*0.83%*
Stock σ	2.47[a]	(0.39)	*1.44%*
Blockholding	-0.52	(0.80)	*-0.11%*
Institutional Ownership	2.20[a]	(0.61)	*1.29%*
LogAnalysts	0.78[a]	(0.19)	*1.55%*
S&P 500	0.28	(0.31)	*0.18%*
High Tech	0.37	(0.24)	*0.18%*
N	3,133		*Uncond. Prob.*
Pseudo-R^2	0.0791		*5.01%*

Figure 1 – Monthly Number of News Stories related to Option Backdating published between January 2006 and December 2008 and available on Factiva. This figure shows the monthly number of news reports citing stock option backdating between January 1, 2006 and December 31, 2008. The sample is obtained through the following keyword search on Factiva: "option* w/5 backdat*". The series *ALL BUS* includes all stories in English satisfying these criteria in the subject areas: Economic News or Commodity/Financial Market News or Corporate/Industrial News. The series *WSJ* (*WSJ-P1*) includes all stories satisfying the same criteria and published on (the front page of) The Wall Street Journal.

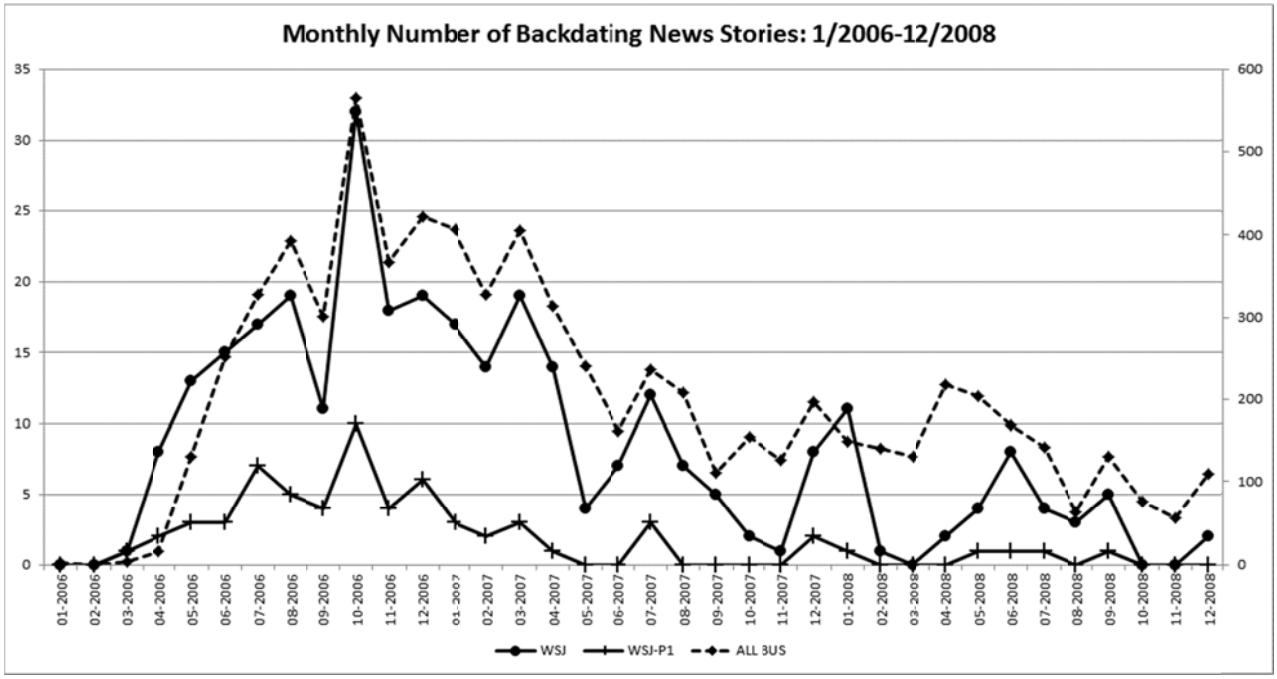

Figure 2 – Monthly Number of SEC Officials' Speeches/Testimonies related to Option Backdating between January 2006 and December 2007. This figure shows the monthly number of official speeches and testimonies on stock option backdating given by representatives of the Securities & Exchange Commission between January 1, 2006 and December 31, 2008, and available at http://www.sec.gov/spotlight/optionsbackdating.htm\#comm .

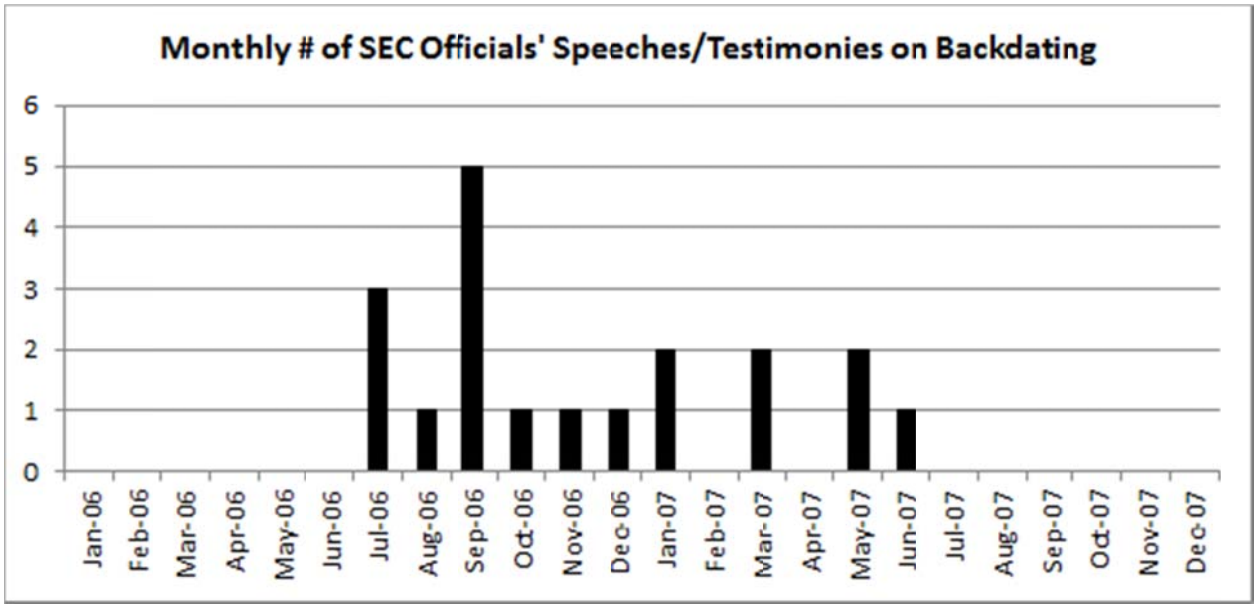

Figure 3 – Difference in Mean Abnormal Institutional Daily Trading Imbalance between High and Low Backdating Risk Stocks (Q5-Q1).

This figure shows the difference between mean abnormal daily trading imbalances in the highest, *Q5*, and lowest, *Q1*, quintiles of predicted likelihood of firm-specific backdating news. The sample is restricted to firms with the data required to estimate the logistic regression model for the likelihood of backdating news in Table A.2. This sample includes 3,133 unique firms, 157 of which are identified as potential backdaters. *Solid black bars* indicate that the mean daily imbalance differential is statistically significant *at least* at the 10% level in a two-sided test.

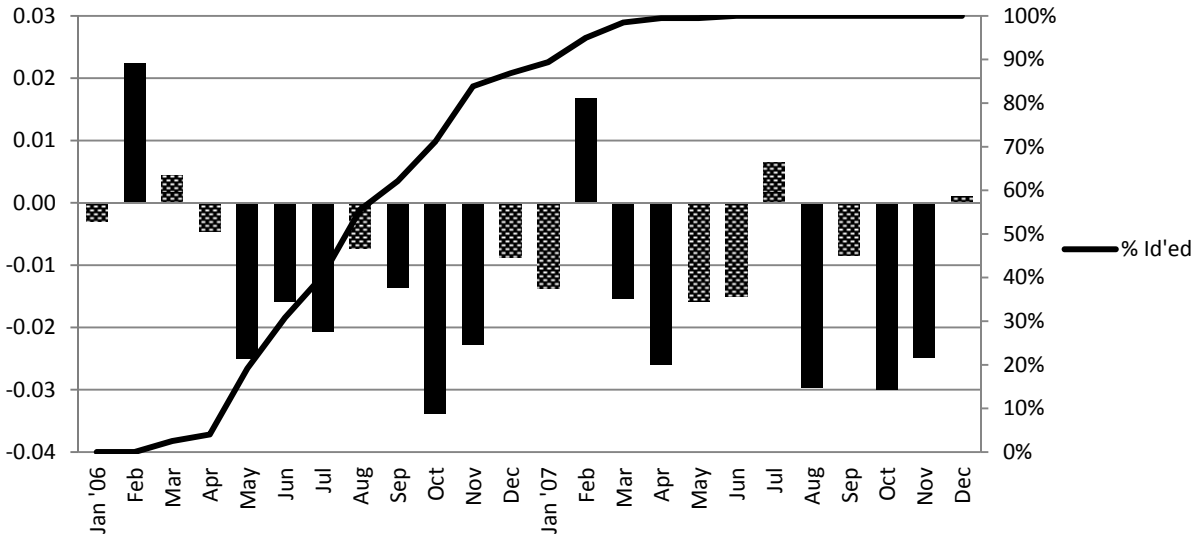

Table 1 – Pre-Scandal Sample Characteristics.
The table reports summary statistics of institutional daily trading activity and firm characteristics measured during or as of the end of 2005. Panel A reports the cross-sectional sample statistics of firm-level time-series daily averages measured during calendar year 2005. Panel B reports the cross-sectional sample statistics of firm-level characteristics measured as of the last fiscal year end during calendar year 2005. In the last two columns, superscripts [a], [b], and [c] denote statistical significance at the 1%, 5%, and 10% levels, respectively. All continuous variables in Panel B are winsorized at the top and bottom 1%. Table A.1 provides details on variable definitions and data sources.

	Backdating Firms				Non-Backdating Firms				*Backdating minus Non-Backdating*	
	N(T)	Mean	Median	Std. Dev.	N	Mean	Median	Std. Dev.	*Means*	*Medians*
Panel A: Institutional Daily Trading Pre-Scandal										
VolInst	198	0.1551	0.1343	0.1048	6,806	0.0719	0.0317	0.1183	*0.0832[a]*	*0.1026[a]*
VolInstBuy	198	0.0805	0.0708	0.0561	6,806	0.0376	0.0146	0.0819	*0.0429[a]*	*0.0561[a]*
VolInstSell	198	0.0746	0.0622	0.0538	6,806	0.0343	0.0145	0.0519	*0.0403[a]*	*0.0477[a]*
VolInstImbal	198	0.0059	0.0033	0.0333	6,806	0.0033	0.0000	0.0692	*0.0026*	*0.0033*
Panel B: Firm Characteristics Pre-Scandal										
LogSize	157	7.1273	7.0528	1.5725	2,976	5.9557	5.9040	1.9230	*1.1716[a]*	*1.1488[a]*
LogAge	157	2.5664	2.5649	0.5580	2,976	2.4379	2.4849	0.9857	*0.1284[a]*	*0.0800*
Leverage	157	0.1535	0.0534	0.2237	2,976	0.1901	0.1305	0.2547	*-0.0366[b]*	*-0.0770[a]*
Dividend Payer	157	0.1783	0.0000	0.3840	2,976	0.2917	0.0000	0.4546	*-0.1133[a]*	*0.0000[a]*
Option	157	0.1441	0.1378	0.0703	2,976	0.1049	0.0929	0.0701	*0.0392[a]*	*0.0448[a]*
Stock σ	157	0.7034	0.6662	0.2554	2,976	0.6290	0.5674	0.3027	*0.0744[a]*	*0.0988[a]*
Blockholding	157	0.1984	0.1807	0.1315	2,976	0.1720	0.1453	0.1467	*0.0265[b]*	*0.0354[a]*
Inst. Ownership	157	0.7342	0.7816	0.2124	2,976	0.5325	0.5684	0.3045	*0.2017[a]*	*0.2132[a]*
LogAnalysts	157	2.4953	2.5649	0.7576	2,976	1.5749	1.7918	1.0391	*0.9204a*	*0.7732a*
S&P 500	157	0.2357	0.0000	0.4258	2,976	0.0995	0.0000	0.2993	*0.1362[a]*	*0.0000[a]*
High-Tech	157	0.2229	0.0000	0.4175	2,976	0.0887	0.0000	0.2844	*0.1342[a]*	*0.0000[a]*
Backdating Likelihood Quintile (1 to 5)	157	4.4968	5.0000	0.8595	2,976	2.9217	3.0000	1.3940	*1.5751[a]*	*2.0000[a]*

Table 2 – Abnormal Institutional Daily Trading *before* the First Release of Firm-specific Backdating News.
This table reports event-time mean abnormal institutional daily trading activity in the *ANcerno* database prior to 198 events corresponding to a first release of firm-specific option backdating news during 2006 and 2007. For each stock, abnormal daily trading activity in the [-120, 0] window is the stock's daily trading activity minus its 2005 *Benchmark Mean*, as defined in Table A.1. The event window is centered on the first release date of firm-specific option backdating news, or the first trading day following such date. Panel A reports the mean daily abnormal buy, sell, and imbalance volumes around all first news events. Panel B reports the mean daily abnormal imbalances around first news events separately for, *SECDOJ or Lawsuit*, 137 firms subject to SEC/DOJ investigation without subsequent exoneration or facing a shareholder class-action or derivative lawsuit and, *No SECDOJ or Lawsuit*, 29 firms receiving SEC/DOJ exoneration notice or facing no shareholder lawsuit, conducting no internal investigation, and not subject to SEC/DOJ investigation. Panel C reports the mean daily abnormal imbalances around first news events separately for, *Early Exposure*, 110 firms whose first backdating news event is in or before August 2006 and, *Late Exposure*, 88 firms whose first backdating news event is between September 2006 and December 2007. Superscripts [a], [b], and [c] denote statistical significance at the 1%, 5%, and 10% levels, respectively. Table A.1 provides details on variable definitions and data sources.

Panel A: Mean *Daily Activity Around All First News*

[Window]	VolInstBuy	VolInstSell	VolInstImbal
[-120, -61]	-0.0014	0.0011	-0.0024
[-60, -21]	-0.0195[a]	-0.0128[a]	-0.0067
[-20, -11]	-0.0190[a]	-0.0005	-0.0185[b]
[-10, -6]	-0.0335[a]	-0.0013	-0.0323[a]
[-5, -1]	-0.0314[a]	0.0032	-0.0346[a]
0	-0.0247[b]	0.0737[a]	-0.0984[a]

Panel B: Mean *Daily Imbalance, Conditional on Investigations and Lawsuits*

[Window]	SECDOJ or Lawsuit	No SECDOJ or Lawsuit	Diff p-value
[-120, -61]	0.0005	0.0059	*0.66*
[-60, -21]	-0.0083	-0.0075	*0.95*
[-20, -11]	-0.0232[b]	-0.0142	*0.59*
[-10, -6]	-0.0347[a]	-0.0121	*0.27*
[-5, -1]	-0.0419[a]	0.0147	*0.02*[b]
0	-0.1322[a]	-0.0362	*0.03*[b]

Panel C: Mean *Daily Imbalance, Conditional on the Timing of the First Firm-Specific Backdating News*

[Window]	Early Exposure	Late Exposure	Diff p-value
[-120, -61]	0.002	-0.0081[c]	*0.36*
[-60, -21]	-0.0126[c]	0.0006	*0.15*
[-20, -11]	-0.0297[b]	-0.0045	*0.10*[c]
[-10, -6]	-0.0476[a]	-0.0131	*0.04*[b]
[-5, -1]	-0.0428[a]	-0.0245[b]	*0.24*
0	-0.1403[a]	-0.0460[a]	*0.01*[a]

Table 3 – Abnormal Profitability of Institutional Trades Executed *before* the First Release of Firm-Specific Backdating News.

This table reports mean abnormal trading profits and calendar-time trading portfolio alpha using *ANcerno* trades prior to 198 events corresponding to a first release of firm-specific option backdating news between 2006 and 2007. Panel A reports the average abnormal trade profit as described in Table A.1. For each trade during the relevant window, the abnormal profit is calculated assuming the trade is reversed either the day after the first firm-specific news or 60 trading days after the news. *Trading windows [-x, -1]* includes all trades taking place during the period starting x trading days before (the day of) the first news event and ending one trading day before the news event. Trading profit estimates are reported in percentages (%). *Num. Trades per Stock-Day* is the average number of trades per stock-day during the trading window. The table reports value-weighted profits based on the principal's dollar value. Panel A reports the value-weighted mean abnormal trading profits for all first news events. Panel B partitions the sample based on the SEC/DOJ investigation outcomes and private litigation/investigations. *SECDOJ or Lawsuit* includes firms subjected to SEC/DOJ investigation without subsequent exoneration or facing a shareholder class-action or derivative lawsuit; *No* includes firms exonerated by the SEC/DOJ or facing no external or internal investigations and no lawsuit. Panel C partitions the sample based on the timing of the first firm-specific news. *Early Exposure* includes firms with first news events during or before August 2006; and *Late Exposure* includes firms with first news events between September 2006 and December 2007. All means reported in Panels A, B, and C are significantly different from zero at the 1% level. All differences between subsamples in Panels B and C are significant at the 1% level. Panel D reports mean daily calendar-time buy-sell portfolio return, computed as described in Table A.1. *#Days* is the number of days for which the daily portfolio return are calculated. The t-stats reported in parentheses are calculated using standard errors adjusted using Newey-West procedure to control for potential autocorrelation and heteroskedasticity. Table A.1 provides details on variables and data sources.

[Window]	Num. Trades per Stock-Day	Mean Profit if trade reversed 1 trading day after exposure	Mean Profit if trade reversed 60 trading days after exposure
Panel A: VW Mean Trade Abnormal Profits, All First News Events			
[-120, -1]	74	-0.27	0.17
[-60, -1]	87	-0.13	0.79
[-20, -1]	102	0.72	1.64

Panel B: Mean Abnormal Profits, Conditional on Investigations and/or Lawsuits

	SECDOJ or Lawsuit	No	SECDOJ or Lawsuit	No	SECDOJ or Lawsuit	No
[-120, -1]	76	123	-0.31	0.24	0.66	-0.53
[-60, -1]	86	157	-0.48	0.51	1.83	-0.45
[-20, -1]	98	134	1.08	-0.24	2.93	-1.51

Panel C: Mean Abnormal Profits, Conditional on the Timing of the First Release of Firm-Specific Backdating News

	Early Exposure	Late Exposure	Early Exposure	Late Exposure	Early Exposure	Late Exposure
[-120, -1]	96	44	-0.48	0.56	-0.07	1.08
[-60, -1]	112	53	-0.31	0.56	0.16	0.95
[-20, -1]	133	59	0.55	1.27	1.28	2.87

Panel D: Daily Calendar-Time Principal-Weighted Trading Portfolio Return, Window: [-20,-1]

	Position reversed the day after the news event		Position reversed 60 trading days after the event	
	#Days	Mean Daily Return	#Days	Mean Daily Return
Full Sample (All First News Event)	319	0.104 (4.31)	402	0.111 (6.69)
Subsample: SECDOJ or Lawsuit	292	0.147 (4.37)	384	0.136 (4.26)
Subsample: Late Exposure	193	0.161 (5.78)	276	0.178 (6.37)

Table 4 – Abnormal Institutional Daily Trading Imbalance *before* the First Release of Firm-Specific Backdating News, by Investor Location.

This table reports mean institutional daily trading imbalances in the *ANcerno* database prior to 198 events corresponding to the first release of firm-specific option backdating news between 2006 and 2007, when trades are segmented based on the location of the portfolio manager relative to the firm's headquarters. Each investor-stock pair is partitioned into one of two groups: *Local* identifies trades in the *ANcerno* set whose portfolio managers are located in the same state as the firm's headquarter; *Non-Local* identifies trades in the *ANcerno* set whose portfolio managers are located outside the firm's headquarter state. For each institution-type: Panel A reports the mean abnormal daily imbalance of institutional trades within event windows centered on first news dates, as defined in Table 2; Panel B reports the mean abnormal daily imbalance for the subsample of 137 firms subjected to SEC/DOJ investigation without subsequent exoneration or facing a shareholder class-action or derivative lawsuit. Panel C reports the mean abnormal daily imbalance for the subsample of 88 firms with first news events between September 2006 and December 2007. Table 2 provides further details on these sample restrictions. Superscripts [a], [b], and [c] denote statistical significance at the 1%, 5%, and 10% levels, respectively. Table A.1 provides details on variable definitions and data sources.

	Investor Location Relative to Firm's HQ	
[Window]	Local	Non-Local
Panel A: Mean Daily Imbalance, All Firms		
[-120, -61]	-0.0034	-0.0093
[-60, -21]	-0.0074[a]	-0.0031
[-20, -1]	-0.0062	-0.0192[a]
0	-0.0473	-0.0638[a]
Panel B: SECDOJ or Lawsuit		
[-120, -61]	-0.0020	-0.0023
[-60, -21]	-0.0043	-0.0021
[-20, -1]	-0.0067[b]	-0.0184[b]
0	-0.0608	-0.0647[a]
Panel C: Late Exposure		
[-120, -61]	-0.0110[b]	-0.0124
[-60, -21]	-0.0098[b]	-0.0007
[-20, -1]	-0.0084[c]	-0.0156[c]
0	0.0067	-0.0507[a]

Table 5 – Abnormal Profitability of Institutional Trades Executed *before* the First Release of Firm-Specific Backdating News, by Investor Location.

This table reports mean abnormal profits of institutional trades in the *ANcerno* set prior to 198 events corresponding to a first release of firm-specific option backdating news between 2006 and 2007, when trades are segmented based on the location of the portfolio manager relative to the firm's headquarters. *Local* identifies trades in the *ANcerno* set whose portfolio managers are located in the same state as the firm's headquarter; *Non-Local* identifies trades in the *ANcerno* set whose portfolio managers are located outside the firm's headquarter state. For each institution-type, the table reports value-weighted mean profits based on the principal's dollar value. A trade's abnormal profit is estimated as described in Table A.1, assuming the trade is reversed on the trading day after the first news event (Panel A) or 60 trading days after the first news event (Panel B). Each panel reports mean profits in percentages (%) for: all first news events, *All Firms*; only first news events of firms subject to government investigations without subsequent exoneration or facing a shareholder lawsuit, *SECDOJ or Lawsuit*; or only first news events occurring after August 2006, *Late Exposure*. Table 2 provides further details on these sample restrictions. Mean profits with a superscript ^{h} are not statistically significant. Mean trade profits with superscript ^{f} and ^{g} are significant at the 5% and 10% level, respectively. All means without superscripts are significant at the 1% level. Table A.1 provides details on variable definitions and data sources.

	Investor Location Relative to Firm's HQ	
[Window]	Local	Non-Local
Panel A: VW Mean Trade Abnormal Profits - Position Reversed the Day after the News Event		
Panel A1: All Firms		
[-120, -1]	0.55	-0.62
[-60, -1]	0.37	-0.32
[-20, -1]	0.90	0.02^{h}
Panel A2: SECDOJ or Lawsuit		
[-120, -1]	0.94	-0.52
[-60, -1]	0.77	-0.64
[-20, -1]	1.69	0.27
Panel A3: Late Exposure		
[-120, -1]	0.72	-0.26
[-60, -1]	0.97	-0.29
[-20, -1]	1.60	0.24
Panel B: VW Mean Trade Abnormal Profits - Position Reversed 60 Trading Days after the News Event		
Panel B1: All Firms		
[-120, -1]	0.73	-0.07
[-60, -1]	0.91	0.15
[-20, -1]	1.88	0.36
Panel B2: SECDOJ or Lawsuit		
[-120, -1]	1.55	-0.05
[-60, -1]	2.08	-0.13
[-20, -1]	3.27	0.61
Panel B3: Late Exposure		
[-120, -1]	1.59	0.01
[-60, -1]	1.36	-0.02
[-20, -1]	2.96	0.15

Table 6 – Abnormal Institutional Daily Trading Imbalance *after* The Wall Street Journal's article "The Perfect Payday" on March 18, 2006, t=0.

This table reports mean abnormal daily imbalance of trades in the *ANcerno* set following the The Wall Street Journal article "The Perfect Payday" on March 18, 2006, conditional on predicted probability of firm-specific backdating news. The sample includes firms in the top quintile of predicted likelihood of firm-specific backdating news (*Q5*) among 3,133 unique firms with available stock price data on CRSP as well as data required to estimate the probability of firm-specific backdating news. The predicted likelihood of firm-specific backdating news is based on the logistic model estimates presented in Table A.2. Panel A reports the mean imbalance for all *Q5* stocks. These stocks are further segmented based on whether the firm is ever exposed to have engaged in option backdating, Panel B, *Q5 Already/Later*, or not, Panel C, *Q5 Never*. Each panel reports *Mean Daily Imbalance*, the mean abnormal institutional daily trading imbalance within event windows following the WSJ article date, t=0. For each trading window, we report the mean abnormal institutional daily trading imbalance separately based on the investor location relative to the firm headquarters, *Local* and *Non-Local*, as described in Tables 4 and 5. Superscripts [a], [b], and [c] denote statistical significance at the 1%, 5%, and 10% levels, respectively. Table A.1 provides details on variable definitions and data sources.

[Window]	Mean Daily Imbalance			*Diff*
	All Trades	Local Trades	Non-Local Trades	*p-value*
Panel A: Q5, All High Backdating Risk Stocks				
[1, 60]	-0.0036	-0.0031[c]	-0.0021	*0.17*
[61, 120]	-0.0081[a]	-0.0018[b]	0.0044	*0.06*
[121, 250]	-0.0003	-0.0002	-0.0029	*0.34*
[251, 350]	-0.0046	-0.0042	-0.0043	*0.55*
Panel B: Q5 Already/Later, High Risk Stocks Already/Later Exposed				
[1, 60]	-0.0088[c]	-0.0080[b]	-0.0182[c]	*0.03*
[61, 120]	-0.0086[b]	-0.0028	-0.0129[b]	*0.08*
[121, 250]	-0.0152[b]	-0.0036	-0.0053	*0.34*
[251, 350]	-0.0112[b]	-0.0021[c]	-0.0091[b]	*0.27*
Panel C: Q5 Never, High Risk Stocks Never Exposed				
[1, 60]	-0.0025	-0.0017	-0.0065[b]	*0.03*
[61, 120]	-0.0080[a]	-0.0015	-0.0026[b]	*0.08*
[121, 250]	0.0027	-0.0010	-0.0024	*0.53*
[251, 350]	-0.0032	-0.0047	-0.0032	*0.80*

Table 7 – Abnormal Profitability of Institutional Trades Executed *after* the WSJ's "The Perfect Payday" article of March 18, 2006, t=0.

This table reports mean abnormal profits of trades in the *ANcerno* set that follow the WSJ article publication date (March 18, 2006). Panel A includes firms in the top quintile (*Q5*) of predicted likelihood of firm-specific backdating news, as described in Table 6. The sample is further segmented based on whether the firm is ever exposed to have engaged in option backdating, Panel B, *Q5 Already/Later*, or not, Panel C, *Q5 Never*. For each trading window, the table also reports mean trade abnormal profits separately based on the investor location relative to the firm headquarters, *Local* and *Non-Local*, as described in Tables 4 and 5. All panels report the value-weighted mean trade abnormal profits based on the principal's dollar value, as defined in Table 3, in percentages (%). Mean profits with a superscript [h] are not statistically significant. Mean trade profits with superscript [f] and [g] are significant at the 5% and 10% level, respectively. All means without superscripts are significant at the 1% level. All differences between *Local* and *Non-Local* mean profits are statistically significant at the 1% level. Table A.1 provides details on variable definitions and data sources.

[Window]	Value-Weighted Mean Trade Abnormal Profits, Position Reversed on Day t After March 18, 2006, in %					
	t=370			t=410		
	All Trades	Local Trades	Non-Local Trades	All Trades	Local Trades	Non-Local Trades
Panel A: Q5, All High Backdating Risk Stocks						
[1, 60]	0.52	0.86	0.30	1.28	1.79	0.40
[61, 120]	0.14	0.37	0.09	0.22	0.57	0.11
[121, 250]	0.21	0.55	0.04	0.16	0.61	0.06
[251, 350]	0.19	0.49	0.03	0.14	0.58	0.05
[1, 350]	0.20	0.31	0.06	0.29	0.40	0.11
Panel B: Q5 Already/Later, High Risk Stocks Already/Later Exposed						
[1, 60]	1.93	3.18	1.56	2.75	3.59	1.84
[61, 120]	0.48	1.21	0.13	0.72	1.54	0.32
[121, 250]	0.43	1.07	0.08	0.27	1.22	0.09
[251, 350]	0.28	0.64	0.04	0.32	0.71	0.06
[1, 350]	0.30	0.86	0.07	0.46	0.92	0.27
Panel C: Q5 Never, High Risk Stocks Never Exposed						
[1, 60]	0.35	0.62	0.14	0.44	0.7	0.21
[61, 120]	-0.06	0.15	-0.11	-0.03	0.18	-0.11
[121, 250]	0.10	0.33	0.02	0.08	0.44	0.05
[251, 350]	0.08	0.27	0.01	0.05	0.32	0.01
[1, 350]	0.11	0.24	0.02	0.12	0.30	0.03

Table 8 – Abnormal Institutional Daily Trading Imbalance *after* the First Release of Firm-Specific Backdating News.

This table reports mean institutional daily trading in the *ANcerno* set following 198 events corresponding to the first release of firm-specific option backdating news between 2006 and 2007. For each stock, abnormal daily trading activity is the stock's daily trading (buy, sell, or buy-minus sell) volume measure minus its 2005 *Benchmark Mean*, as defined in Table A.1. Panel A reports the mean daily abnormal buy, sell, and imbalance volumes following all first news events. Panel B reports the mean abnormal daily imbalances separately for the subsample of firms subject to SEC/DOJ investigation without subsequent exoneration or facing a shareholder lawsuit, *SECDOJ or Lawsuit*, and the subsample of firms receiving SEC/DOJ exoneration or facing no shareholder lawsuit and no internal or external investigation, *No*. Panel C reports the mean abnormal daily imbalances separately for the subsample of firms whose first backdating news event is in or before August 2006, *Early Exposure*, and the subsample of firms whose first backdating news event is between September 2006 and December 2007, *Late Exposure*. Panel D reports the mean daily abnormal daily imbalances separately for *Local* and *Non-Local* investors, as defined in Tables 4 and 5. Superscripts [a], [b], and [c] denote statistical significance at the 1%, 5%, and 10% levels, respectively. Table A.1 provides details on variable definitions and data sources.

Panel A: Mean Abnormal Trading Activity after All First News

[Window]	VolInstBuy	VolInstSell	VolInstImbal
[1, 5]	-0.0050	0.0565[c]	-0.0615[b]
[6, 10]	-0.0231[a]	-0.0064	-0.0167[c]
[11, 20]	-0.0203[a]	-0.0120[c]	-0.0084

Panel B: Mean Abnormal Daily Imbalance, Conditional on Investigations and Lawsuits

	SECDOJ or Lawsuit	No	*Diff p-value*
[1, 5]	-0.0520[a]	-0.0037	*0.05*[b]
[6, 10]	-0.0330[b]	0.0086	*0.02*[b]
[11, 20]	-0.0184[b]	0.0011	*0.17*

Panel C: Mean Abnormal Daily Imbalance, Conditional on the Timing of the First Firm-Specific Backdating News

	Early Exposure	Late Exposure	*Diff p-value*
[1, 5]	-0.0539[a]	-0.0710[c]	*0.79*
[6, 10]	-0.0262[c]	-0.0048	*0.22*
[11, 20]	-0.0114	-0.0046	*0.58*

Panel D: Mean Abnormal Daily Imbalance, Conditional on Investor Location

	Local	Non-Local	*Diff p-value*
[1,5]	-0.0005	-0.0643[a]	*0.03*[b]
[6,10]	0.0006	-0.0512[b]	*0.07*[c]
[11,20]	0.0047	-0.0018	*0.20*

Table 9 – Abnormal Profitability of Institutional Trades Executed *after* the First Release of Firm-Specific Backdating News.

This table reports mean abnormal profits of trades in the *ANcerno* set executed after 198 first releases of firm-specific option backdating news during 2006 and 2007. For each trade executed during the relevant window, abnormal trade profit is computed as described in Table A.1, assuming the trade is reversed t (i.e., *2* or *60*) trading days after the end of the trading window. We include all trades executed in the [0, 20] event window: the period starting on the event day and ending 20 trading days after the event date. Trading profit estimates are reported in percentages (%). *Num. Trades per Stock-Day* is the average number of trades per stock-day during the relevant window. Reported means are value-weighted based on the principal's dollar value. Panel A reports the value-weighted mean trade abnormal profits for all first news events. Panel B reports the value-weighted mean trade abnormal profits when the sample is partitioned based on SEC/DOJ investigations and shareholder lawsuits. Panel C reports the value-weighted mean trade abnormal profits when the sample is partitioned based on the timing of the first firm-specific news. Panel D reports the value-weighted mean trade abnormal profits when the sample is partitioned based on the investor location relative to the firm headquarters. Mean profits with a superscript ^{g} indicates statistical significance at the 10% level. All other reported means are significantly different from zero at the 1% level. Mean differences between *SECDOJ or Lawsuit* and *No* (Panel B) and between *Local* and *Non-Local* traders (Panel D) are statistically significant at the 1% level. Mean differences between *Early* and *Late Exposure* (Panel C) are not statistically significant. Table A.1 provides details on variable definitions and data sources.

		Position Reversed t days after the trading window			
[Window]	Num. Trades per Stock-Day	t=2		t=60	
Panel A: VW Mean Trade Abnormal Profits, All First News					
[0, 20]	70	-0.03^{g}		-0.60	
Panel B: Mean Abnormal Profits, Conditional on Investigations and Lawsuits					
	SECDOJ or Lawsuit	No	SECDOJ or Lawsuit	No	SECDOJ or Lawsuit	No
[0, 20]	81	58	0.36	-2.04	-0.58	-0.66
Panel C: Mean Abnormal Profits, Conditional on the Timing of the First Firm-Specific Backdating News						
	Early Exposure	Late Exposure	Early Exposure	Late Exposure	Early Exposure	Late Exposure
[0, 20]	98	44	0.07	-0.34	-0.58	-0.66
Panel D: Mean Abnormal Profits, Conditional on Investor Location						
	Local	Non-Local	Local	Non-Local	Local	Non-Local
[0, 20]	18	53	0.29	-0.14	0.18	-0.73