



Institutional trading during a wave of corporate scandals: “Perfect Payday”?☆



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ARTICLE INFO

Article history:

Received 17 December 2013

Received in revised form 7 February 2015

Accepted 13 July 2015

Available online 18 July 2015

JEL classification:

G11

G12

G14

G39

M41

Keywords:

Institutional investors

Trading

Scandal

Option backdating

Local investors

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. 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, institutional investors behave as informed investors, particularly in local stocks, during this prolonged period of heightened uncertainty about corporate reporting and governance practices.

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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., [Boehmer and Kelley, 2009](#); [Holden and Subrahmanyam, 1992](#); [Sias and Starks, 1997](#)). Yet, systematic patterns in institutional activity such as positive-feedback trading ([De Long et al., 1990](#); [Griffin et al., 2003](#)) and herding behavior ([Avery and Zemsky, 1998](#);

☆ We are very grateful for the comments and suggestions of two anonymous referees, Robert Battalio, Vidhi Chhaochharia, Douglas Cumming, Alex Edmans, John Griffin, Jean Helwege, Randall Heron, Jiekun Huang, Gregg Jarrell, Eric Kelley, Sandy Klasa, Alok Kumar, Doron Levit (NFA discussant), Erik Lie, Emmanuel Morales-Camargo (SWFA discussant), Tao Shu (FMA discussant), Richard Sias, Konstantinos Stathopoulos (EFA discussant), Kevin Tang, Joe Zhang, Tingyu Zhou (CFA-JCF discussant) and seminar participants at University of Miami, University of Michigan-Dearborn, as well as 2012 NFA, 2013 SWFA, 2013 FMA, and 2013 EFA meetings and the 2014 CFA-JCF Conference on Financial Market Misconduct. We also gratefully acknowledge the assistance of students at the University of Miami in updating the backdating news sample for this project: Moayed Almoayed, Abdullateef Alsumait, Paola Caicedo, Santiago Nieto, Theresa Recicar, Sean Sappanos, Michael Schwarzmann, James Seyfried, Ashley Somers, and James Steinlage. We bear full responsibility for any remaining errors.

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Bikhchandani et al., 1992; Scharfstein and Stein, 1990; 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 et al. (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 et al., 2012) or takeover announcements (Jegadeesh and Tang, 2010).³

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?

There is scant prior systematic analysis of the role of institutional trading around exposures of corporate reporting and governance failures.⁴ 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 et al. (2012) and Jegadeesh and Tang (2010).⁵ 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 (Carow et al., 2009; Gleason et al., 2008). 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, 2006.⁶ 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.

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.⁷ 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

³ The two studies find conflicting results regarding whether *some* institutional investors are able to take advantage of their connections with investment banks. Griffin et al. (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. These studies are related to another strand of literature that focuses on *affiliated* institutional investors and generally find that affiliated investors trade profitably ahead of corporate announcements, e.g., investment bank-affiliated (Bodnaruk et al., 2009) and lender-affiliated (Ivashina and Sun, 2011) managers.

⁴ The sole study that we are aware of is a study by Hribar et al. (2009) that examines patterns in institutional trading prior to earnings restatements. They find that institutional investors as a group do not sell ahead of earnings restatements, but transient institutional investors do. Our research has a similar motivation, but our trading data allows for a more granular analysis of the trading activities in the days immediately preceding the corporate events of interest.

⁵ A related strand of literature examines insider trading around these corporate events. Examples of these studies include Agrawal and Cooper (2015) and Augustin, Brenner, and Subrahmanyam (2014). Agrawal and Cooper (2015) document that managers of firms restating their earnings are more likely to sell stocks during the misstated period. Augustin, Brenner, and Subrahmanyam (2014) find trading activities in the options market that are consistent with informed trading by insiders prior to M&A announcements.

⁶ 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 follow-up 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.

⁷ 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.

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 stock in our sample: *Local*, i.e., those located in the same state as the firm's headquarters, and *Non-Local*.⁸

Consistent with the notion that firm-investor proximity is associated with more informed trading (e.g., Baik et al., 2010; Coval and Moskowitz, 2001), 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 destabilizing 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 – and 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 et al. (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 et al. (2010) indicates that 80% of respondents would 'vote with their feet', i.e., trade, to make their voices heard on governance matters.⁹ While Karpoff and Lou (2009) find 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 as a group 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 et al. (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.

⁸ 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 (Baik et al., 2010; Coval and Moskowitz, 2001) 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 et al. (2014) 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.

⁹ 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 (e.g., Karpoff et al., 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., 2010) or trading (e.g., Chen et al., 2007; Helwege et al., 2012; Parrino et al., 2003).

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 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, 2009), the practice was virtually unknown to the investing public prior to the WSJ's Pulitzer Prize-winning 'The Perfect Payday' article on March 18, 2006.¹⁰ As Fig. 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 7272 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 Fig. 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 (Bernile and Jarrell, 2009; Narayanan et al., 2007). 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 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.

2.1. 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 et al. (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.¹¹ Moreover, Jegadeesh and Tang (2010) find no evidence of aggregate institutional trades anticipating takeover announcements using the same *ANCerno* dataset that we use.^{12,13}

We also conjecture that the magnitude and timing of institutional trading should reflect the nature of a firm's involvement in the scandal. 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 more severe backdating cases (*H1a*).

2.2. 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*).¹⁴

¹⁰ 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 (Forelle and Bandler, 2006).

¹¹ 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.

¹² 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.

¹³ Another common approach relies on algorithms that classify unidentified publicly available trading volumes. For instance, Campbell et al. (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 et al. (2006) and Sias and Starks (1997).

¹⁴ 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.

Monthly Number of Backdating News Stories: 1/2006-12/2008

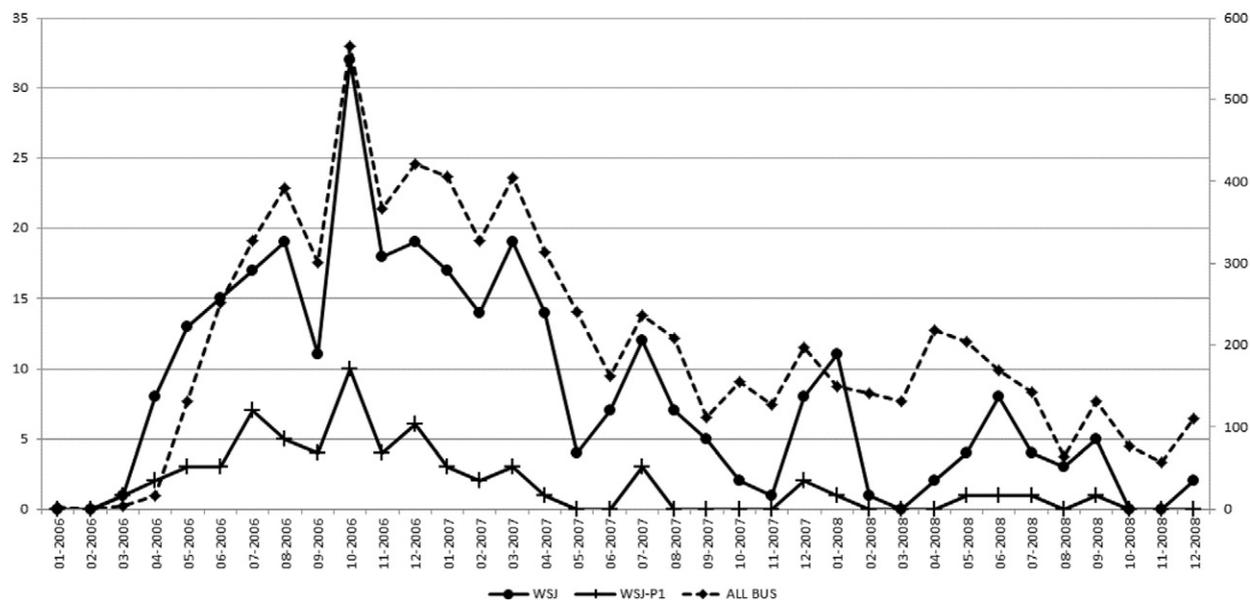


Fig. 1. Monthly number of news stories related to option backdating published between January 2006 and December 2008 and available on Factiva. This figure shows the monthly number of news reports citing stock option backdating between January 1, 2006 and December 31, 2008. The sample is obtained through 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.

Moreover, similar to the logic above, we expect the profitability of institutional pre-exposure trades to depend on the likely severity of the backdating. In particular, if pre-exposure institutional trades are informed, their abnormal profitability should be higher for likely more severe backdating cases (*H2a*).

2.3. 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., Baik et al., 2010; Coval and Moskowitz, 1999, 2001). 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.

In light of these arguments, we conjecture that the role of institutional trading during the backdating scandal varies with investors' proximity to the firm. Specifically, *local* institutions should experience negative pre-exposure imbalances earlier in event time than

Monthly # of SEC Officials' Speeches/Testimonies on Backdating

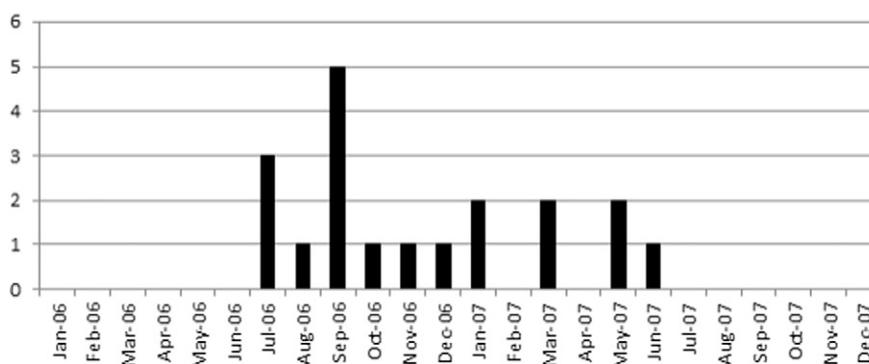


Fig. 2. Monthly number of SEC officials' speeches/testimonies related to option backdating between January 2006 and December 2007. This figure shows the monthly number of official speeches and testimonies on stock option backdating given by representatives of the Securities & Exchange Commission between January 1, 2006 and December 31, 2008, and available at <http://www.sec.gov/spotlight/optionsbackdating.html#comm>.

non-local ones (*H1b*). Moreover, pre-exposure trades of local institutions should earn higher abnormal profits than similarly timed *non-local* trades (*H2b*). 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.

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

The previous conjectures (*H1–H2*) 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 (*H3*). 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, *H3* should hold predominantly during the first wave of backdating exposures, but not later on (*H3a*). Moreover, given the logic above, we conjecture that trades of more informed, i.e., *local*, investors are unlikely to fuel potentially inefficient contagion (*H3b*). Finally, if institutional activities on high risk stocks are informed, then the profitability of institutional trades should be higher for firms ultimately exposed (*H3c*) and more so for *local* trades (*H3d*).

Second, we test whether the first arrival of firm-specific backdating news prompts continued (over-) reaction by institutional investors (*H4*). 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 (*H4a*) and occur early in the wave of the backdating scandal (*H4b*). 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 (*H4c*), whereas post-exposure *local* trades should continue to be more profitable at short and long horizons (*H4d*).

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 and Co (2007) on March 16, 2007; and (3) the list last provided by Dow Jones News Service on September 6, 2007.¹⁵ 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.¹⁶ 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 6806 firms in the ANcerno's set that are never associated 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., Bizjak et al., 2009; Carow et al., 2009; Heron and Lie, 2009). The data requirements for this part of the analysis reduce the sample to 3133 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). The coverage of the ANcerno database is relatively broad. During the 2000–2005 period immediately preceding our analysis period, institutions in the ANcerno database are responsible for approximately 8–10% of the dollar value of CRSP trading volume. An important feature of ANcerno database is that its institutional clients include mostly buy-side entities, such as CalPERS, Putman Investments, and

¹⁵ The WSJ's list is available at <http://online.wsj.com/public/resources/documents/info-optionscore06-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.

¹⁶ 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.

Massachusetts Financial Services (MFS), that are unlikely to be affiliated with corporations through investment banking or lending activities.¹⁷

Another 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.¹⁸ 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 the absolute value of trading volumes, 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 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 5 × 5 size and book-to-market matching portfolios from Ken French's website.¹⁹ Finally, we retrieve analyst coverage data from Institutional Brokers' Estimate System (I/B/E/S) and quarterly snapshots of total institutional ownership of 13(f) investors from Thomson-Reuters Institutional Holdings Database.²⁰ 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% 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.

The first three rows of Panel A report the main variables of interest: *FracBuy*, fraction of buys in ANcerno institutions' trades; *FracSell*, fraction of sells; and *FracImbal*, the difference between the two. We report these statistics separately for the backdating and non-backdating firms. For both samples, institutional investors are net buyers during 2005. There is almost no difference between the two samples.

The remaining rows of Panel A report the trading activities as a fraction of shares outstanding. The numbers indicate that, during 2005, the mean (median) firm-level daily trading activity of ANcerno institutions as a fraction of shares outstanding 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 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. 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.²¹ 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.

¹⁷ ANcerno is a widely recognized consulting firm that monitors equity trading costs of institutional investors. 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.

¹⁸ The availability of actual trade data is particularly desirable in light of the evidence in Boehmer and Kelley (2009) and Campbell et al. (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.

¹⁹ At http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/ftp/25_Portfolios_5x5_Daily.zip.

²⁰ Unlike the ANcerno dataset, the 13-f database contains almost all of institutional investors' U.S. holdings. However, it does not contain the daily position and/or trading data necessary for the trading and profitability analysis performed in this paper.

²¹ These characteristics are consistent with stylized facts on the determinants of institutional ownership – see, for instance, recent evidence in Yan and Zhang (2009).

Table 1
Pre-scandal sample characteristics.

	Backdating firms				Non-Backdating firms				Backdating minus non-Backdating	
	N(T)	Mean	Median	Std. Dev.	N	Mean	Median	Std. Dev.	Means	Medians
<i>Panel A: Institutional daily trading pre-scandal</i>										
<i>FracBuy</i>	198	0.5256	0.5315	0.1153	6806	0.5291	0.5445	0.2272	−0.0035	−0.013
<i>FracSell</i>	198	0.4744	0.4685	0.1153	6806	0.4709	0.4555	0.2272	0.0035	0.013
<i>FracImbal</i>	198	0.0511	0.0631	0.2307	6806	0.0582	0.0890	0.4545	−0.0071	−0.026
<i>Vollnst</i>	198	0.1551	0.1343	0.1048	6806	0.0719	0.0317	0.1183	0.0832***	0.1026***
<i>VollnstBuy</i>	198	0.0805	0.0708	0.0561	6806	0.0376	0.0146	0.0819	0.0429***	0.0561***
<i>VollnstSell</i>	198	0.0746	0.0622	0.0538	6806	0.0343	0.0145	0.0519	0.0403***	0.0477***
<i>VollnstImbal</i>	198	0.0059	0.0033	0.0333	6806	0.0033	0.0000	0.0692	0.0026	0.0033
<i>Panel B: Firm characteristics pre-scandal</i>										
<i>LogSize</i>	157	7.1273	7.0528	1.5725	2976	5.9557	5.9040	1.9230	1.1716***	1.1488***
<i>LogAge</i>	157	2.5664	2.5649	0.5580	2976	2.4379	2.4849	0.9857	0.1284***	0.0800
<i>Leverage</i>	157	0.1535	0.0534	0.2237	2976	0.1901	0.1305	0.2547	−0.0366**	−0.0770***
<i>Dividend Payer</i>	157	0.1783	0.0000	0.3840	2976	0.2917	0.0000	0.4546	−0.1133***	0.0000***
<i>Option</i>	157	0.1441	0.1378	0.0703	2976	0.1049	0.0929	0.0701	0.0392***	0.0448***
<i>Stock σ</i>	157	0.7034	0.6662	0.2554	2976	0.6290	0.5674	0.3027	0.0744***	0.0988***
<i>Blockholding</i>	157	0.1984	0.1807	0.1315	2976	0.1720	0.1453	0.1467	0.0265**	0.0354***
<i>Inst. Ownership</i>	157	0.7342	0.7816	0.2124	2976	0.5325	0.5684	0.3045	0.2017***	0.2132***
<i>LogAnalysts</i>	157	2.4953	2.5649	0.7576	2976	1.5749	1.7918	1.0391	0.9204***	0.7732***
<i>S&P 500</i>	157	0.2357	0.0000	0.4258	2976	0.0995	0.0000	0.2993	0.1362***	0.0000***
<i>High-Tech</i>	157	0.2229	0.0000	0.4175	2976	0.0887	0.0000	0.2844	0.1342***	0.0000***
<i>Backdating</i>										
Likelihood	157	4.4968	5.0000	0.8595	2976	2.9217	3.0000	1.3940	1.5751***	2.0000***
Quintile (1 to 5)										

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, asterisks ***, **, and * 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.

3.3. Predictive model

In the later part of the paper, we use a predictive model to generate a sample of non-backdating firms that are similar to firms in our backdating sample from the point of view of naive investors. To do this, we estimate 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 (Bernile and Jarrell, 2009; Bizjak et al., 2009; Carow et al., 2009; Heron and Lie, 2009; Narayanan et al., 2007). 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). We focus on firms in Q5, and compare those that are caught in the backdating scandal vis-à-vis those that are not.²²

While a detailed discussion of the model is beyond the scope of this paper, some observations are noteworthy.²³ 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. Empirical results

In this section we discuss the empirical methods used to test our hypotheses and the resulting evidence. Section 4.1 presents the empirical evidence regarding the role of institutional trading in anticipation of firm-specific backdating exposures (H1–H2). In Sections 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 (H3) and the role of institutional trading in reaction to the first arrival of firm-specific backdating news (H4), respectively.

²² As expected, firms in Q5 – particularly those that are caught in the backdating scandal – are more likely to incorporate options in their compensation packages. High-risk firms issued more option grants (amounting to about 37.44% of total compensation, t-stat = 11.23) than non-high-risk firms. Within the high-risk firm sample (Q5), those involved in backdating issued slightly more option grants (about 7.23% of total compensation, t-stat = 2.47) than high-risk firms that are not involved.

²³ 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.

Table 2Abnormal institutional daily trading *before* the first release of firm-specific backdating news.

Panel A: Mean abnormal daily activity around all first news			
[Window]	<i>AbnFracBuy</i>	<i>AbnFracSell</i>	<i>AbnFracImbal</i>
[−60, −21]	−0.0364**	0.0364**	−0.0727** (0.05)
[−20, −11]	−0.0113	0.0113	−0.0227 (0.53)
[−10, −6]	−0.0413*	0.0413*	−0.0825* (0.10)
[−5, −1]	−0.0807***	0.0807***	−0.1615*** (0.00)
0	−0.0909***	0.0909***	−0.1819*** (0.00)
Panel B: Mean abnormal daily imbalance, conditional on investigations and lawsuits			
[Window]	SECDOJ or Lawsuit	No SECDOJ or Lawsuit	Diff p-value
[−60, −21]	−0.0940**	−0.0621	(0.76)
[−20, −11]	−0.0854	0.0081	(0.50)
[−10, −6]	−0.1057*	0.0389	(0.33)
[−5, −1]	−0.1792***	0.0621	(0.08)
0	−0.2035***	−0.0136	(0.05)

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 (*AbnFracBuy*, *AbnFracSell*, and *AbnFracImbal*) in each trading window is the stock's daily trading activity in that window (as a fraction of total buy plus sell volume) 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. Asterisks ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Table A.1 provides details on variable definitions and data sources.

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 the total institutional trading volume (i.e., buy plus sell volumes), 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:

$$AbnFrac = \sum_{i=1}^N \frac{1}{N} \sum_{t=k}^{k+T} \frac{1}{T} (Frac_{it} - Benchmark_i) \quad (1)$$

where $Frac_{it}$ is the trading volume fraction (i.e., *FracBuy*, *FracSell*, or *FracImbal*) 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 corresponding 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. By construction, the daily abnormal sell volumes are the negative of the corresponding buy volumes. Therefore, institutional sell volumes are positive across all pre-exposure windows. The magnitude of the abnormal selling activities are quite similar between the event day and the five trading days immediately preceding it. The abnormal fraction of sales is about 16–18% higher than that of purchases during those six trading days.²⁴

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. 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.²⁵

²⁴ While not the focus of this study, the significant institutional investors' selling activities on the day of the announcement are consistent with their ability to quickly process publicly available news as highlighted in Griffin et al. (2012).

²⁵ 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 using the probability model described in the next section, and (2) has the highest correlation with the backdating firm in terms of residual buy-sell imbalance in the benchmark period. 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*. The results of this untabulated analysis are available upon request.

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. 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 suffering 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 – particularly in the five trading days immediately leading up to the event day – 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.

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, $t = 0$.²⁶ We estimate institutional trades' abnormal profits as follows. First, for each transaction in the database, we compute its raw percentage profit as:

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

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 Eq. (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 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.

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 C of Table 3 reports the time-series mean of the hedge portfolio daily returns for the whole sample and the *SECDOJ or Lawsuit* subsample. The main inferences remain unaffected: institutional trades executed in the month leading to backdating exposures are profitable, on average. Moreover, in the subsample of more severe cases, 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 C show that our inferences and the magnitudes of abnormal returns remain unchanged when we assume a longer holding horizon.

²⁶ In unreported analysis, we use 20 trading days and obtain consistent results.

Table 3Abnormal profitability of institutional trades executed *before* the first release of firm-specific backdating news.

Panel A: VW mean trade abnormal profits, all first news events						
[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			
[−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
[−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: 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)		

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. All means reported in Panels A and B are significantly different from zero at the 1% level. All differences between subsamples in Panel B are significant at the 1% level. Panel C 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.

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 et al., 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 4Abnormal institutional daily trading imbalance *before* the first release of firm-specific backdating news, by investor location.

Investor location relative to firm's HQ			
[Window]	Local	Non-Local	Diff p-value
Panel A: Mean abnormal daily imbalance, all firms			
[−60, −21]	−0.2039**	−0.0814*	(0.00)
[−20, −1]	−0.0690	−0.1450***	(0.04)
0	−0.1008	−0.2757***	(0.46)
Panel B: Mean abnormal daily imbalance, SECDOJ or Lawsuit			
[−60, −21]	−0.2149**	−0.0590	(0.00)
[−20, −1]	−0.0669	−0.1401***	(0.09)
0	0.0381	−0.2382***	(0.44)

This table reports mean abnormal 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), while 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. Table 2 provides further details on this sample restriction. Asterisks ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Table A.1 provides details on variable definitions and data sources.

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 in Panel A, and for the subsample of *SECDOJ* or *Lawsuit* in Panel B. Supporting H3a, Panel A shows that local investors experience significantly negative pre-exposure abnormal imbalances earlier in event time ($[-60, -21]$ trading days prior to the event date) than non-local ones ($[-20, -1]$ trading days). In particular, local traders' sell trading volume is 20.39% larger than their buy trading volume in the earlier $[-60, -21]$ window, while the corresponding metric is only 8.14% for non-local traders. The latter figure increases as we get closer to the first release of firm-specific news: non-local traders' sell trading volume is 14.50% larger than their buy trading volume in the later $[-20, -1]$ window, which is twice the magnitude of the corresponding metric for local traders. The differences in pre-exposure trading activities across investors are similar quantitatively for the *SECDOJ* or *Lawsuit* subsample in Panel B.

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 for *SECDOJ* or *Lawsuit* firms only. Across trading windows, liquidation horizons, and targeted stocks, we find that local pre-exposure trades earn positive mean abnormal profits that are significantly higher than similarly timed non-local trades. In particular, the mean hypothetical profit of local trades executed in days $[-20, -1]$ is about 90 basis points if the position is reversed the day following the first release of firm-specific information. The mean hypothetical profit of these local trades is 1.88% if the initiated position is reversed three months after the information first becomes public. These profits are substantially larger for local trades on firms subject to government (SEC/DOJ) investigations without subsequent exoneration. In contrast, non-local trades do not enjoy similar profitability, even for trades on firms experiencing more severe backdating cases.

Supporting H3b, the evidence in Table 5 indicates 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.

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?

Table 5

Abnormal profitability of institutional trades executed *before* the first release of firm-specific backdating news, by investor location.

[Window]	Investor location relative to firm's HQ	
	Local	Non-Local
<i>Panel A: VW mean trade abnormal profits – position reversed the day after the news event</i>		
Panel A1: All firms		
$[-60, -1]$	0.37	-0.32
$[-20, -1]$	0.90	0.02 ^z
Panel A2: SECDOJ or Lawsuit		
$[-60, -1]$	0.77	-0.64
$[-20, -1]$	1.69	0.27
<i>Panel B: VW mean trade abnormal profits – position reversed 60 trading days after the news event</i>		
Panel B1: All firms		
$[-60, -1]$	0.91	0.15
$[-20, -1]$	1.88	0.36
Panel B2: SECDOJ or Lawsuit		
$[-60, -1]$	2.08	-0.13
$[-20, -1]$	3.27	0.61

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*; or only first news events of firms subject to government investigations without subsequent exoneration or facing a shareholder lawsuit, *SECDOJ* or *Lawsuit*. Table 2 provides further details on this sample restriction. Mean profits with a superscript ^z are not statistically significant. All other means 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.

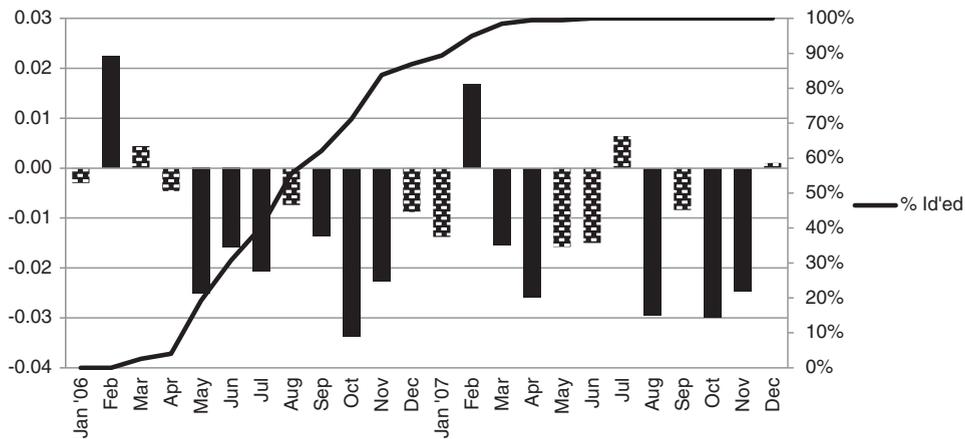


Fig. 3. Difference in mean abnormal institutional daily trading imbalance between high and low backdating risk stocks (Q5–Q1). This figure shows the difference between mean abnormal daily trading imbalances in the highest, Q5, and lowest, Q1, quintiles of predicted likelihood of firm-specific backdating 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 3133 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.

4.2.1. Institutional trading activities on high backdating risk stocks

Our analysis in this section uses the predictive model described in Section 3.3 and Appendix A.2. The analysis mostly focuses on firms whose predicted backdating probability is in the highest quintile, Q5 (“high risk”, henceforth). Nonetheless, it is informative to compare abnormal institutional trading imbalances across the extreme backdating likelihood quintiles (Q1 and Q5). Fig. 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 March 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 Fig. 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.

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 in Panel C, instead, abnormal imbalances are never statistically significant even at the height of the scandal. The absence of negative trading imbalance in Panel C also confirms that the documented imbalances for backdating firms do not simply reflect market-wide trends.

In the last three columns of 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 for Q5-Never stocks only for the first two months.²⁷ In contrast, non-local institutions’ abnormal imbalances are negative and significant throughout almost the whole first year following the WSJ’s ‘The Perfect Payday’ article. Thus, supporting H3b 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

²⁷ Moreover, as we discuss in the next subsection, the trades of local institutions continue to be profitable for this group of stocks, which is not the case for non-local institutions. This suggests that the local abnormal selling may be due to information related to other aspects of the firms’ condition, rather than negative information regarding the backdating practices.

Table 6Abnormal institutional daily trading imbalance *after* the Wall Street Journal's article "The Perfect Payday" on March 18, 2006, $t = 0$.

Mean abnormal daily imbalance				
[Window]	All trades	Local trades	Non-Local trades	Diff p-value
<i>Panel A: Q5, All high backdating risk stocks</i>				
[1, 60]	-0.0404*	-0.1306***	-0.0045	(0.00)
[61, 120]	-0.0355	-0.0017	-0.0636***	(0.19)
[121, 250]	-0.0538**	-0.0801*	-0.0428**	(0.41)
[251, 350]	-0.0648**	-0.0659	-0.0534***	(0.78)
<i>Panel B: Q5 Already/after, high risk stocks already/after exposed</i>				
[1, 60]	-0.1551***	-0.1896**	-0.1240**	(0.01)
[61, 120]	-0.1063**	-0.0648	-0.1266**	(0.22)
[121, 250]	-0.1387***	-0.1994**	-0.0771*	(0.82)
[251, 350]	-0.0899*	-0.0171	-0.1510***	(0.33)
<i>Panel C: Q5 Never, high risk stocks never exposed</i>				
[1, 60]	-0.0127	-0.1136**	0.0217	(0.51)
[61, 120]	-0.0186	0.0160	-0.0498**	(0.53)
[121, 250]	-0.0367	-0.0465	-0.0352*	(0.19)
[251, 350]	-0.0343	-0.0794	-0.0318	(0.18)

This table reports mean abnormal daily imbalance of trades in the *ANcerno* set following 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 3133 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/After*, or not, Panel C, *Q5 Never*. Each panel reports *Mean Abnormal 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. Asterisks ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Table A.1 provides details on variable definitions and data sources.

risk stocks, Panel A, and separately for high risk stocks actually, *Q5-Already/After*, 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

Table 7Abnormal profitability of institutional trades executed *after* the WSJ's "The Perfect Payday" article of March 18, 2006, $t = 0$.

[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
<i>Panel A: Q5, All high backdating risk stocks</i>						
[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
<i>Panel B: Q5 Already/after, high risk stocks already/after exposed</i>						
[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
<i>Panel C: Q5 Never, high risk stocks never exposed</i>						
[1, 60]	0.35	0.62	0.14	0.44	0.70	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

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/After*, 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 described in Table A.1, in percentages (%). All means 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.

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 *H3c*, 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 *H3d*, 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 (*H3a*) by the less informed, i.e., non-local, institutions (*H3b*). 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 the efficiency of the price formation process in the market if they fuel an *excessive* reaction to the arrival of firm-specific news (*H4*). 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 (*H4a*) and among less informed, i.e., *non-local*, institutions (*H4b*). 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 (*H4c*).

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, and by firm-investor proximity, in Panel C. Consistent with the general tenor of *H4*, 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 *H4a*, we find that the continued institutional reaction to firm-specific exposures is statistically and economically larger when the exposure is likely more salient (i.e., the SEC/DOJ sample in 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, the evidence in Panel C suggests that only the activity of less informed, i.e., non-local, institutions fuels protracted and potentially destabilizing reactions to firm-specific exposures (*H4b*). In an untabulated analysis, we find that the post-event selling in the SEC/DOJ sample is solely due to non-local investors; if anything, local institutions act as net buyers following the events.

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 *H4c*, the evidence in Panel C 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 *H4b*, 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, consistent with *H4d*. Together with the results in Panel C 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 option backdating, 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

Table 8Abnormal institutional daily trading imbalance *after* the first release of firm-specific backdating news.

Panel A: Mean abnormal trading activity after all first news			
[Window]	<i>AbnFracBuy</i>	<i>AbnFracSell</i>	<i>AbnFracImbal</i>
[1, 5]	−0.0302	0.0302	−0.0604
[6, 10]	−0.0555**	0.0555**	−0.1110**
[11, 20]	−0.0444*	0.0444*	−0.0887*
Panel B: Mean abnormal daily imbalance, conditional on investigations and lawsuits			
	SECDOJ or Lawsuit	No	Diff p-value
[1, 5]	−0.1036*	−0.0465	(0.70)
[6, 10]	−0.1838***	0.0394	(0.15)
[11, 20]	−0.1893***	0.0001	(0.18)
Panel C: Mean abnormal daily imbalance, conditional on investor location			
	Local	Non-Local	Diff p-value
[1, 5]	0.0109	−0.1332**	(0.05)
[6, 10]	−0.0101	−0.1322**	(0.07)
[11, 20]	0.0216	−0.1439***	(0.04)

This table reports mean abnormal 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 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. Asterisks ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Table A.1 provides details on variable definitions and data sources.

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

Table 9Abnormal profitability of institutional trades executed *after* the first release of firm-specific backdating news.

Panel A: VW mean trade abnormal profits, all first news						
[Window]	Num. Trades per Stock-Day	Position reversed <i>t</i> days after the trading window				
		<i>t</i> = 2	<i>t</i> = 60			
[0, 20]	70	−0.03 ^x		−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 investor location						
	Local	Non-Local	Local	Non-Local	Local	Non-Local
[0, 20]	18	53	0.29	−0.14	0.18	−0.73

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 ^x 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* (in Panel B) and between *Local* and *Non-Local* traders (in Panel C) are statistically significant at the 1% level. Table A.1 provides details on variable definitions and data sources.

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.

Appendix A

Table A.1

Variable definitions.

Variable	Definition
<i>Trading fraction measures</i>	
<i>FracBuy</i>	Daily institutional buy volume as a percentage of total (i.e., buy plus sell) trading volume
<i>FracSell</i>	Daily institutional sell volume as a percentage of total (i.e., buy plus sell) trading volume
<i>FracImbal</i>	<i>FracBuy</i> minus <i>FracSell</i> ; daily institutional trading volume imbalance as a percentage of total trading volume
<i>Abnormal trading fraction measures</i>	
<i>AbnFracBuy</i>	<i>FracBuy</i> minus its average for the firm in 2005
<i>AbnFracSell</i>	<i>FracSell</i> minus its average for the firm in 2005
<i>AbnFracImbal</i>	<i>FracImbal</i> minus its average for the firm in 2005
<i>Trading volume measures</i>	
<i>Vollnst</i>	Daily institutional total (buy plus sell) volume as a percentage of the latest number of shares outstanding
<i>VollnstBuy</i>	Daily institutional buy volume as a percentage of shares outstanding
<i>VollnstSell</i>	Daily institutional sell volume as a percentage of shares outstanding
<i>VollnstImbal</i>	<i>VollnstBuy</i> minus <i>VollnstSell</i> ; daily institutional trading volume imbalance as a percentage of shares outstanding
<i>Profit/return measures</i>	
<i>Trading Profit (%)</i>	For buys, $100 * (\text{CRSP Price}_{t+1} - \text{ANCerno Buy Price}) / \text{ANCerno Buy Price}$, adjusted for stock splits and dividend distributions; For sells, $100 * (\text{ANCerno Sell Price} - \text{CRSP Price}_{t+1}) / \text{ANCerno Sell Price}$, adjusted for stock splits and dividend distributions
<i>Abnormal Trading Profit (%)</i>	Trading profit in excess of buy-and-hold return of Fama-French matching 5×5 portfolio based on market value of equity and ratio of book value of equity to market value of equity as of December 2005
<i>Daily Calendar-Time Buy-Sell Portfolio Return (%)</i>	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.
<i>Firm characteristics</i>	
<i>BackdateDum</i>	Indicator variable equal to 1 if there is public release of firm-specific backdating news, and zero otherwise
<i>Benchmark Mean_i</i>	Calendar year 2005 time-series mean of stock <i>i</i> 's daily institutional trading activity as a percentage of shares outstanding (<i>ANCerno</i>)
<i>Benchmark Std_i</i>	Calendar year 2005 time-series standard deviation of stock <i>i</i> 's daily (scaled) institutional trading activity
<i>LogSize</i>	Natural log of equity market capitalization (Compustat: item 25 * item 199) as of the fiscal year ending in 2005
<i>LogAge</i>	Natural log of number of years since firm's first appearance on CRSP database as of the fiscal year ending in 2005
<i>Leverage</i>	Ratio of total book debt to total book assets (Compustat: (item 9 + item 34)/item 6) as of the fiscal year ending in 2005
<i>Dividend Payer</i>	Indicator variable equal to 1 if firm pays cash dividends to common shares (Compustat: item 21) as of the fiscal year ending in 2005
<i>Option</i>	Value of stock options outstanding at year-end (Compustat: OPTOSEY / item 25) as of the fiscal year ending in 2005
<i>Stock σ</i>	Annualized stock return daily volatility during prior 5 years as of the fiscal year ending in 2005
<i>LogAnalysts</i>	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
<i>Blockholding</i>	Total % ownership of 13 F filers with at least 5% stake each as of the fiscal year ending in 2005
<i>Institutional Ownership</i>	Total % ownership of 13 F filers as reported at end of previous quarter as of the fiscal year ending in 2005
<i>S&P 500</i>	Indicator variable equal to 1 if firm included in the S&P500 as of the fiscal year ending in 2005
<i>High Tech</i>	Indicator variable equal to 1 if SIC code between 7370–7379 (Heron and Lie, 2009) as of the fiscal year ending in 2005
<i>Backdating Likelihood Quintile</i>	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

Table A.2
Determinants of firm-specific option backdating news likelihood.

	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	3133		Uncond. Prob.
Pseudo-R ²	0.0791		5.01%

This table reports logistic regression estimates of the determinants of firm-specific option backdating news. The sample includes 3133 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.

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