

DISCUSSION PAPER SERIES

DP16476

Filing Speed, Information Leakage, and Price Formation

Jeffrey L Callen, Ron Kaniel and Dan Segal

FINANCIAL ECONOMICS

CEPR

Filing Speed, Information Leakage, and Price Formation

Jeffrey L Callen, Ron Kaniel and Dan Segal

Discussion Paper DP16476
Published 21 August 2021
Submitted 19 August 2021

Centre for Economic Policy Research
33 Great Sutton Street, London EC1V 0DX, UK
Tel: +44 (0)20 7183 8801
www.cepr.org

This Discussion Paper is issued under the auspices of the Centre's research programmes:

- Financial Economics

Any opinions expressed here are those of the author(s) and not those of the Centre for Economic Policy Research. Research disseminated by CEPR may include views on policy, but the Centre itself takes no institutional policy positions.

The Centre for Economic Policy Research was established in 1983 as an educational charity, to promote independent analysis and public discussion of open economies and the relations among them. It is pluralist and non-partisan, bringing economic research to bear on the analysis of medium- and long-run policy questions.

These Discussion Papers often represent preliminary or incomplete work, circulated to encourage discussion and comment. Citation and use of such a paper should take account of its provisional character.

Copyright: Jeffrey L Callen, Ron Kaniel and Dan Segal

Filing Speed, Information Leakage, and Price Formation

Abstract

This study investigates the price discovery process in equity markets with informed institutional investors. Consistent with extant theories, we show empirically that institutional investors, in contrast to retail investors, trade based on the leaked sign of unanticipated news and then (partially) reverse their trades when the news become public. We also find that the longer the leakage period for institutional investors to exploit, the less informative is the news when it becomes public. These results are robust to controls for firm press releases and news articles and endogeneity concerns.

JEL Classification: N/A

Keywords: Filing Lag, Institutional Trading, 8K reports, private information

Jeffrey L Callen - callen@rotman.utoronto.ca
University of Toronto - Rotman School of Management

Ron Kaniel - ron.kaniel@simon.rochester.edu
University of Rochester and CEPR

Dan Segal - dsegal@idc.ac.il
Interdisciplinary Center (IDC) Herzliyah

Filing Speed, Information Leakage, and Price Formation

Jeffrey L. Callen

University of Toronto - Rotman School of Management

Ron Kaniel

University of Rochester - Simon Business School; CEPR

Dan Segal

Interdisciplinary Center (IDC) Herzliyah

ABSTRACT

This study investigates the price discovery process in equity markets with informed institutional investors. Consistent with extant theories, we show empirically that institutional investors, in contrast to retail investors, trade based on the leaked sign of unanticipated news *and* then (partially) reverse their trades when the news become public. We also find that the longer the leakage period for institutional investors to exploit, the less informative is the news when it becomes public. These results are robust to controls for firm press releases and news articles and endogeneity concerns.

Key Words: Filing Lag, Institutional Trading, 8K reports, Private Information

1. Introduction

This study investigates the price discovery process in equity markets driven by informed institutional investors. Our research setting focuses on a subset of SEC mandated 8K filings that offer a number of unique advantages for investigating the links between information leakage, institutional investor trades and price discovery. Chief among these is the fact that 8K's contain material and value relevant information, and have a distinct date by which the firm learns of a material event (the Event Date) and by which the information regarding the event becomes public knowledge (the Filing Date). Knowledge of the event date allows us to investigate, inter alia, whether information leaked to institutional investors prior to the event without having to model/forecast an uncertain event date. Knowledge of the specific filing date allows us to examine volumes and returns generated by interactions between informed and uninformed investors. Knowledge of both dates allows us to examine how returns and volumes evolve as a function of the filing lag - defined as the period between the filing and event dates.¹ We can think of no other venue for which the uncertainties regarding information leakage and the concomitant price discovery process are so circumscribed.

We utilize *unanticipated* SEC mandated 8K filings to study equity price discovery in the context of institutional trading because the ability of informed traders to exploit this information is more likely due to leakage (tipping) rather than because of the superior forecasting ability of informed traders. By unanticipated, we mean Form 8K events *other* than those reporting business operations and preliminary earnings because the latter are likely anticipated by informed traders. We focus on unanticipated events because they are idiosyncratic in nature – their timing and impact on the firm's earnings and cash flows are largely unpredictable. Therefore, if informed traders are able to exploit this information, the reason is more likely to be due to leakage rather than because of the superior forecasting ability of informed traders.

Our study yields a number of new empirical results. First, we conjecture and find that informed institutional traders exploit leaked information (from lagged 8K filings) by following a 'Buy on the Rumor Sell on the News' strategy (Hirshleifer, Subrahmanyam, and Titman, 1994; Brunnermeier, 2005), which, henceforth, we call *strategic trading*. In this strategy, informed traders transact based on the leaked sign of the news and then (partially) reverse their trades when the news become public (on

¹ We use the terms 'reporting lag' and 'filing lag' interchangeably.

average, news become public after 2.7 business days). We show that informed traders react almost immediately to the event and earn a mean (median) profit from their trading strategy of 1.9% (0.9%) across the sample of 8K reports. Second, as a consequence of information leakage, we conjecture and find that trading volume *and* equity return volatilities on the date the information becomes public decrease with the length of the filing lag. In other words, the longer the filing lag for institutional investors to exploit, the lower the information content and the less uncertainty regarding equity prices when the news finally becomes public. The effect is both statistically and economically significant. In particular, we find that on average about two-thirds of the impact of the news is impounded in trading *prior* to the actual release of the news, and the amount of information impounded in trading decreases monotonically over the filing lag – from 0.52 (2 days filing lag) to 0.82 (7 days filing lag). Third, we find that those institutional investors who are able to capitalize on information leakage by engaging in *strategic trading* produce superior returns even without having to reverse their positions after the filing date. These results suggest that the superiority of strategic institutional traders (over other institutional traders who trade for liquidity or index tracking purposes for example) in extracting information leakage is an innate characteristic of these institutional investors.

While our major results and various sensitivity analyses suggest that informed institutional traders are privy to the information prior to its becoming public, our study does not allow us to determine how institutional investors obtain the information prior to the filing date. One possibility is that managers disclose the information in private meetings (Bushee et al. 2017; Bushee et al. 2018) which have become more prevalent following RegFD. The extant empirical evidence suggests that investors who participate in such meetings benefit insofar as they are able to identify future takeover targets (Subasi 2014), and generate higher returns on trades that occur during the meetings (Bushee et al. 2017) or during the quarter of the meeting (Solomon and Soltes 2014). However, it is unlikely that the benefits arise from material information released by managers during these meeting because that would constitute a direct violation of RegFD. Rather, Bushee et al. (2017) propose that trading by investors following one-to-one meetings with management can be attributed to several factors such as nonverbal cues and/or information that is not about material events, but which allows investors to update their private information. Another possibility is that institutional investors obtain information through leakage from insiders. While there is no empirical evidence to this

effect, not surprisingly, anecdotal evidence supports this possibility. For example, in 2007, the SEC brought charges against several individuals for trading shares based on insider information about USB AG analysts' upcoming downgrades.

An alternative explanation is that institutional investors have the means to obtain information through obscure data sources or from sophisticated research methods (e.g., satellite photos) rather than leakage. However, these alternative explanations are not likely because of the nature of the news reported via 8K reports. First, it is unlikely that the information is recorded in other data sources prior to disclosure by management. Second, the events reported are largely informational in nature without a detectable “physical” component (such as entry into material agreements, changes in management, and auditor resignations).

Our contribution to the literature can be summarized as follows. First, our research setting allows us to determine that there is information leakage of material information and that, in contrast to retail investors, institutional investors are able to capitalize on the leaked information. While other studies document results that are potentially consistent with information leakage around changes in analysts' recommendations (Kadan et al. 2017; Irvine et al. 2007; Christophe et al. 2010), these results are consistent with alternative explanations. In particular, informed traders are likely able to predict analyst recommendation changes following major informational events such as earnings announcements and trade accordingly. In contrast, we believe that our setting delivers as convincing empirical evidence as possible on information leakage precisely because of the nature of 8K reports. Second, our results suggest that 8K reporting requirements of material information provides institutional investors with economically significant opportunities to profit from informational advantage, thereby largely voiding the main objective of Reg FD to level the playing field. Hence, our evidence questions the need to allow firms up to four business days to report material events. Third, the evidence calls into doubt the research methodology that investigates investor reaction to material information around the filing date. Our results suggest that 8K news is largely incorporated into price by the filing date.²

² A concurrent study by Ben-Rephael et al. (2017) examines institutional and retail investor attention around 8K event and filing dates. They measure institutional (retail) attention by the number of searches on Bloomberg terminals (google). They find heightened attention by institutional investors around the event and filing dates, and no change in attention by retail investors. They then provide evidence that price discovery increases with attention. Our paper differs from Ben-Rephael et al. (2017) on the following dimensions: (1) They do not test the hypotheses of this study and, in particular, the implications of 'Buy on the Rumor Sell on the News' strategy of Hirshleifer et al. (1994) and Brunnermeier (2005) on

In what follows, Section 2 develops the formal hypotheses of this study. Section 3 describes the data. Section 4 provides the empirical results. Section 5 concludes.

2. Hypotheses Development

Public firms are required to report specific material corporate events of interest to security holders on a fairly current basis with the SEC using Form 8K (“current report”). Events that trigger an obligation to file an 8K include material events affecting, *inter alia*, the registrant’s business and operations, financial information, securities and trading markets, financial statements, corporate governance, management, and external auditors.³

Until August 2004, most events on the 8K report had to be filed within 15 business days of the event.⁴ In August 2004, the SEC considerably expanded the scope of the events to be reported via an 8K and shortened the time-period required to disclose these events to no more than 4 business days. Other than reports of company operations (i.e., 8K reports containing item 2.02), which are typically the preliminary earnings, the information contained in 8Ks are by and large unanticipated. Preliminary earnings are reported on a quarterly basis and most companies provide the exact date and time of the announcement in advance, so that the information is anticipated by market participants. In contrast, almost all other 8K reports depend on the occurrence of events that are idiosyncratic. Although investors are likely to predict that certain events would be reported via 8K reports (e.g., results of clinical trials, CEO departures, Mergers and Acquisitions), they typically cannot easily predict the exact timing of the event or its financial consequences to the firm, if any.⁵ To help ensure that that these events are

price formation. (2) Because of data limitations, they do not provide evidence related to the extent, magnitude, and economic benefits associated with strategic trading. (3) Our research methodology allows us to provide direct evidence on price discovery on each day during the event window. (4) Our sample is much larger covering all 8K items. Specifically, their analysis is restricted to 5 news items only. Excluding all filings with filing gap of less than 2 days, their sample comprises of around 17 thousand 8K filings, whereas our sample is comprised of over 95 thousand filings.

³ Lerman and Livnat (2010) show that 8K’s often trigger market reactions in the form of abnormal equity returns and trading volumes. Segal and Segal (2016) show that managers disclose negative non-earnings information from the 8K report strategically when investor attention is low. Rubin et al. (2017) examine analysts’ reaction to 8K information. Bird and Karolyi (2016) examine the effect of institutional ownership on the quality of the 8K disclosure.

⁴ With the exception of auditor changes (resignation/firing/hiring) and director resignations that had to be reported within five business days.

⁵ While clearly some of the events are predictable, the overall evidence in the literature suggests that 8K forms are by and large unpredictable as their filing results in significant abnormal returns and analysts’ revisions.

truly unanticipated, we control for press releases and news articles in some of our empirical tests below (See Section 4.2).

Two theoretical papers, despite modeling differences, provide similar assessments as to how informed institutional traders capitalize on private information - a setting that is consistent with information leakage. Hirshleifer et al. (1994) develop a model of trading behavior where risk-averse informed (high ability) traders receive private information before uninformed (low ability) traders. The model predicts that the informed traders transact based on the sign of the news and then (partially) reverse their trade when the news become public, at which point, prices fully reflect the private information. This trading strategy is termed 'Buy on the Rumor Sell on the News'. In a similar vein, Brunnermeier (2005) shows analytically that risk-neutral informed traders engage in a similar strategy because of the expectation that the market will overreact to the news when it becomes public. The overreaction in Brunnermeier's model stems from the assumption that traders employ technical analysis after the public announcement to determine the extent to which the news is already incorporated into stock prices. Because the leaked information includes noise, prices just prior to the public announcement will also incorporate this noise, which in turn causes the uninformed traders to err in their technical analysis, leading to an overreaction. Anticipating the overreaction, informed traders reverse their position to take advantage of the mispricing.

These considerations yield our first set of hypotheses regarding the trading strategy of institutional investors in the context of 8K filing lags

Hypothesis 1A: Informed institutional investors will undertake a trading strategy of buying (selling) shares for positive (negative) 8K news before the filing date and reversing their position after the filing date

Hypothesis 1B: The likelihood of the latter trading strategy is increasing in the filing lag.

The logic behind Hypothesis 1B is straightforward. The longer the filing lag, the greater is the likelihood of information leakage and, hence, the greater the number of informed traders to adopt such a strategy.

Given the likelihood of information leakage and subsequent informed trading, both Hirshleifer et al. (1994) and Brunnermeier (2005) predict heightened trading volume and stock return volatilities around the event date. Moreover, taking into consideration that some investors are uninformed, heightened trading volume and stock return volatilities should obtain around the filing date as well.⁶ But given the 'Buy on the Rumor Sell on the News' trading strategy, trading around the filing date should also be affected by the filing lag. After all, the longer the filing lag, the greater is the likelihood of information leakage so that the informativeness of idiosyncratic firm-level news contained in the 8K at the time of the event disclosure should be reduced. With the longer leakage period for institutional investors to exploit by trading, the less uncertainty there should be about equity prices when the information finally becomes public. These considerations lead to our next hypotheses:

H2A: Informed institutional trading volume around the filing date is negatively related to the filing lag.

H2B: Equity return volatility is negatively related to the filing lag.

3. Data

3.1 8K data

We download the entire population of 8K Forms filed with the SEC via EDGAR for the years 1996 to 2013. The initial sample consists of 895,760 8K forms with firm identifier, filing and event dates, and items reported. Requiring valid Permno and excluding 8K forms that include exhibits only, reduces the sample to 563,987 forms. Given our focus on non-earnings information, we eliminate all 8K reports that contain earnings announcements or financial statements and exhibits (74,830 forms) and 8K reports with missing equity returns around the filing date (46,479 forms), thereby reducing the sample size to 442,678 8K forms.

Financial data are obtained from Compustat and CRSP. Requiring non-missing values for share price, profitability, leverage, equity return volatility, book value of

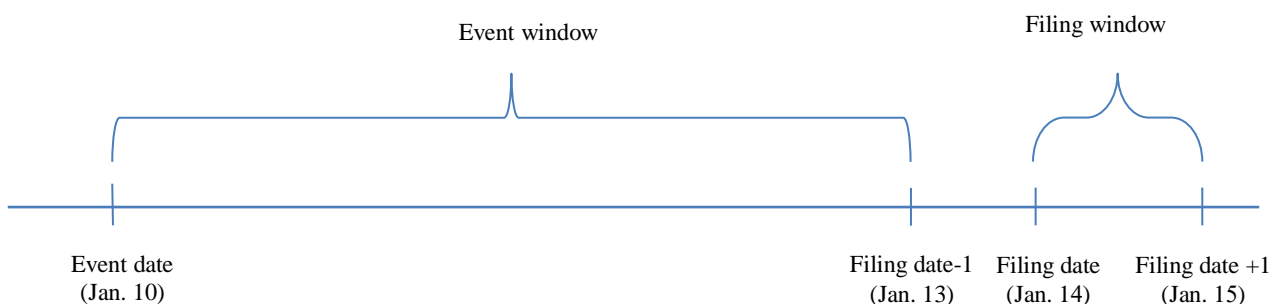
⁶ Indeed, Lerman and Livnat (2010) provide evidence of heightened trading around both the 8K event and filing dates.

equity, and the number of analysts following (obtained from IBES) at the beginning of the fiscal year further reduces the 8K sample to 384,373 reports.

3.2 Institutional Trading Data

Our sample includes transaction-level institutional trading data from January 1999 through the end of 2010 from Abel Noser Solutions.⁷ According to Ancerno, the transaction data are transferred directly from each institutions' trading system to Abel Noser Solutions. The data include stocks traded, number of shares traded, and price per share. Importantly, names of the institutions are eliminated from the database, so it is impossible to identify the type of institution behind the trade (e.g., pension fund, mutual fund, etc.). However, each institution is identified by a unique code so that we can track each institution's trades across stocks and over time. As described in various studies, the institutions covered by the database are large and the volume of trades represents 12% of CRSP volume (see Hu et al. 2018 for comprehensive review of the data).⁸

Before describing the data, it is helpful to describe the setting and timeline.



In this example, the Event date (e.g., date of resignation of a director or date of auditor departure) is January 10. The company reports the event via an 8K form on January 14, the Filing date, yielding a filing lag of 4 days. The Event window starts on the Event date and ends one day prior to the Filing date. Hence, in this example the event window

⁷ Abel Noser stopped reporting unique institutional identifiers after 2011 to further protect their clients' privacy. Hence, it is impossible to track an institution's trades across stocks and time after 2011. Also, note that the 8K sample period is longer than the institutional data. Therefore, we elect to use the expanded 8K sample whenever institutional data are not required, in order to increase the power of the tests.

⁸ Hu et al. (2018) provide a comprehensive review of the data and note that the data has been widely used in the accounting and finance literatures. Their analysis indicates that that the database contains 12 years of data covering 233 million transactions with \$37 trillion traded. They find that institutional trade sizes decline dramatically over time, rendering institutional trade size based inferences problematic, and that the data cover 12% of CRSP volume.

is January 10 to 13 inclusive. We define Day_t as the tth trading day during the event window. Thus, Day₁ would be Jan 10, Day₂ would be Jan 11, and so on. Note that Day_t is defined in terms of trading days, so that Day₁ could be 2 days after the event date if the event falls on a Saturday. The Filing window is the Filing date plus the first trading day after the Filing date.

Table 1, Panel A provides descriptive statistics of the sample firms. Mean and median market value of equity are \$2.2 billion and \$305 million, respectively. Mean return on assets is -2.4%. Mean equity return volatility is 3.6% per day, and the mean book-to-market ratio is 0.75. Mean book leverage is 22%. The mean number of analysts following a firm in a given year is 6.2. Appendix III provides variable definitions.

Table 1, Panel B provides descriptive statistics on the number of 8K reports and the filing lag. Consistent with the evidence in the literature, Panel B shows that the number of firms in the sample is decreasing over time in more recent years (from 4,355 in 2004 to 3,327 in 2013). The number of 8K reports is correlated with the number of firms, although we observe an increase in the number of reports especially after 2004, consistent with the expansion in the scope of items to be reported. The economic magnitudes of the events are significant as evidenced by mean absolute market adjusted cumulative returns during the filing window. These range from 2.5% in 2013 to 5.2% in 2000. The Filing lag decreases monotonically from a mean of 6 days in 1996 to 2.4 days in 2004. The largest decrease (in percentage terms) occurs in 2000 coinciding with RegFD. Interestingly, given that the mean filing lag by 2004 was already below 4 business days, the change in the 8K reporting requirements in 2004 had no discernable effect on the mean filing lag.

Table 1, Panel C reports the proportion of each event type, average economic magnitude, and filing lag for each 8K item. Consistent with Segal and Segal (2016) and Rubin et al. (2017), the most frequent items after 2004 are Item 8.01, "Other Events," (29%); Item 1.01, "Entry into a Material Definitive Agreement" (20%); and Item 5.02, "Departure of Directors or Principal Officers, Election of Directors, Appointment of Principal Officers" (23%). Prior to 2004 the most frequent item was Item 5, "Other Events" followed by Item 2 "Acquisition or Disposition of Assets". The table points to variation in filing lags across the various items, although these variations do not appear to be economically significant as they are between 3 and 4 days for most categories after 2004. Not surprisingly, there is greater variation in reporting lags before 2004.

4. Empirical Analysis

4.1 Institutional Trading and Information Leakage

We initially analyze institutional trading around 8K filing days in order to determine the extent of institutional trading and the extent of information leakage.⁹ The initial sample includes all firms on Ancerno that filed at least one 8K form. The 8K sample available for the analysis comprises 328,297 8K forms which were filed between 1998 and 2010 -- the sample years of the Ancerno data. To be able to effectively separate the event and filing dates we drop 145,014 8K forms with a filing lag less than 2 days.¹⁰ An additional 85,570 forms were filed by firms for which institutional data are not available. Hence, the final 8K sample available for the institutional trading analysis is 97,713 forms. Since the frequency of filing lags greater than 7 drops significantly, we combine all forms with filing lags equal to or greater than 7 into a single category.

To examine the trading pattern around the 8K dates, we regress daily trading volume of institutional investors (scaled by the number of shares outstanding) on daily 8K indicator variables for two pre-event days (M1 and M2),¹¹ the event window and the filing window, in addition to firm-level control variables, and firm, year, and item fixed effects.¹² The firm-level control variables include those variables that were shown to be related to the trading volume and disclosure decisions of the firm (e.g Segal and Segal, 2016). They include proxies for profitability, operating risk, size, growth, financial risk, and analysts' coverage. In addition, we include a control for negative news as firms are more likely to delay disclosure of negative news for various reasons such as litigation risk (Kothari et al., 2009). We use these control variables throughout

⁹ The data include separate codes for the fund family (e.g. Fidelity) and for specific fund within the fund family (e.g., Fidelity's Magellan Fund). We examine the trading around 8K filings at the specific fund level.

¹⁰ Although companies indicate the 'event date' on the 8K form, it is possible that the event occurs after trading hours. Hence, if the company files the 8K report on the day after the event date, we cannot determine whether the informed trader was aware of the news as early as on the event date.

¹¹ The event date is typically the date on which the information first becomes known. However, in many cases, information about the impending event can leak out. For example, consider director resignations. The event date is the date on which the director resigns. However, information about the director's intention to resign is likely to leak out prior to the actual resignation date as the director contemplates whether and when to resign.

¹² Total volume transacted during the day is an alternative potential deflator. However, results are quite sensitive to scaling by total volume. The reason is that total volume, which includes institutional investor volume not accounted for in Ancerno, increases considerably during the event and filing windows - on average we observe an increase of roughly 22% in total volume. Consequently, when scaling (the increasing) daily trading volume of institutional traders by (the increasing) total volume, we do not observe any change during the aforementioned periods.

the analyses. The regressions are estimated using OLS with standard errors clustered by firm. A positive coefficient on the indicator days indicates “abnormal” trading volume – that is, greater trading activity relative to non-news days.¹³

The results in Table 2 clearly indicate information leakage to institutional investors as early as on the event date. We find that institutional investor trading volume on the days prior to the event date is not significantly different from volume on non-news days indicating no information leakage prior to the event date. However, institutional investor volume trading is significantly higher (relative to non-news days) on the event date and up to 3 trading days after the event date. The largest reaction is on the first trading day after the event date, potentially because some of the events become known only after trading hours (see Segal and Segal, 2016 for evidence on firms' decision to disclose negative news after trading hours). The abnormal volume decreases monotonically from the first trading day after the event date and becomes insignificant on the fourth trading day of the event window. We also observe significant spikes in volume on the filing date itself and on the first trading day after the filing date.¹⁴ This result suggests that not all institutions are informed prior to the filing date – that is, some of the institutions are liquidity providers and/or noise traders. The coefficients on the control variables indicate that trading volume by institutional investors is increasing with firm size, profitability, leverage, growth (given the negative coefficient on the book-to-market ratio), and equity return volatility. The positive coefficient on size suggests that institutional traders trade more extensively in large firms probably because of their greater liquidity and ability to trade without having a price impact.

To examine whether the results are affected by the length of the reporting lag, we repeat the analysis separately for each filing lag window by excluding the trading days around the 8K forms with different filing lags. For example, the 2 Days column in Table 2 shows results when we exclude trading days around 8K forms with filing lags greater than 2 days. The results are very similar to the full sample results. The table also shows that inferences are not affected by the sign of the news as measured by the

¹³ We define non-news days as the days on which the company did not issue preliminary earnings or 10-Q or 10-K reports. In other words, we exclude from the sample the days on which the company reported preliminary earnings and the 10-Q and 10-K reports.

¹⁴ The differences between the coefficients on the days within the event window are highly significant (p -value <0.01). Also, untabulated tests show a spike in the coefficient on the first filing day relative to the last day of the event window.

sign of cumulative market-adjusted stock returns during the filing window. Taken together, results indicate that there is information leakage concurrent with the event date or immediately afterwards, and that (some) institutional investors react immediately to the news.

4.2 Testing the Hypothesis

The results above indicate that institutional investors trade significantly during the event window. We now examine whether institutional investors exploit their information advantage and engage in strategic trading as conjectured in Hypotheses 1A and 1B.

To test hypotheses 1A and 1B, we construct a strategic trading variable as follows. We first define the sign of the news as the sign of the market-adjusted equity return during the filing window. For each institutional investor who traded both during the 8K event and filing windows, we compute the net shares transacted during the 8K event window as the total number of shares acquired minus the total number of shares sold. We also compute the net shares transacted in the 2 business days starting with the specific 8K filing date.¹⁵ For each institution that traded during the 8K event window, we define an indicator variable that takes the value one if (i) the sign of net trading during the event window is consistent with the sign of the news *and* (ii) the sign of net trading during the filing window is opposite to the sign of the news, and zero otherwise. We then create an aggregate variable for each 8K form, labeled Total Strategic Trading, by summing the indicator variables for all institutions. Total Strategic Trading measures the number of institutional investors that engaged in strategic trading for each 8K form. We also compute the proportion of institutional investors that engaged in strategic trading by dividing Total Strategic Trading by the total number of distinct institutional investors that traded shares during the event and filing windows.

We further examine the relation between information leakage and institutional trading by analyzing the relation between the filing lag and institutional trading during the filing window. While the results in Table 2 show heightened trading on the filing date (relative to non-news days), a decrease in abnormal volume over the filing lag would also be indicative of information leakage because it suggests that institutional

¹⁵ We use 3 days window to allow for the possibility that 8K forms are reported on the last trading day of the week, and to give institutional investors sufficient time to reverse their trading position

investors traded on the news prior to the filing date. We measure institutional abnormal trading volume during the filing window as the average volume during the 2-day filing window scaled by the filing firm's average daily volume over non-news days during the year.

Table 3, Panel A reports the mean of the log and proportion of Total Strategic Trading and Abnormal Filing Volume by filing lag. The bottom line of the panel indicates that about 11% of the total institutions' trades during the event window are associated with strategic trading. The average number of institutions that engage in strategic trading is 1.7.¹⁶ In an untabulated analysis, we find that the strategic trading occurs fairly evenly across all 8K items, suggesting that institutions take informational advantage whatever the source of the news. In a separate analysis, we examine the proportion of institutions that trade during the event window and do not reverse their position after the filing date. Institutions may decide to continue to hold their position post filing date for various reasons, such as viewing the investment as long-term. The results indicate that 54% of institutions that trade during the event window do so in a manner that is consistent with the sign of the news, whereas the unconditional mean is 51%. The difference is highly significant based on bootstrapping analysis. We further investigate the ability of institutional investors to extract private information in Section 4.5 below. The overall mean of abnormal volume during the filing lag is 1.107 indicating that, on average, volume during the filing window is higher by about 11% relative to non-news days.

Table 3, Panel A also shows the mean of the trading variables by filing lag. We observe an almost monotonic increase in the Total Strategic Trading across the filing lags, and a decrease in the mean Abnormal Filing Volume. Specifically, the log of strategic trading increases monotonically from 0.20 for the 2-day filing lag to 0.268 for the 6-day filing lag and is 0.228 for the 7-day lag. We observe the opposite pattern for Abnormal Filing Volume, which decreases from 1.20 for the 2-day filing lag to 1.07 for

¹⁶ The ostensibly small number of institutions that engage in strategic trading is explained by the observation that for 75% of the 8K forms there is no strategic trading. There are two reasons for this: first, not all 8K's contain significant economic news, and second, institutional investors do not always reverse their position (i.e. that they trade according to the sign of the news, but do not reverse their position post filing) and, hence, are not captured by our sample of "strategic traders". To further ascertain the magnitude of strategic trading, we exclude 8K reports that did not yield strategic trading. We find that the mean number of institutional investors that engage in strategic trading is 7.4.

the 7-day filing lag.¹⁷ These results are consistent with the conjecture that the longer the filing lag, the more opportunities institutional investors have to exploit their informational advantage, and consequently, the lower the trading over the filing window.

The proportion of strategic trades relative to total trades by institutional investors shows a downtrend over the reporting lag. This result is explained by the trading pattern we observe in Table 2 where informed institutional investors appear to trade immediately on or after the event date. Because the scaled variables are computed as Total Strategic Trading scaled by the total number of institutions that trade during the event window, the scaled variable should decrease over the reporting lag. This follows because the numerator is relatively fixed - as the first leg of the strategic trading occurs in the first or second event date - whereas the denominator (the number of institutions that trade) naturally increases with the filing lag as institutional investors trade regularly on a daily basis.

Panel B of Table 3 formally tests the predictions that the frequency of strategic trading increases with the reporting lag (H1B) and that trading volume around the filing date decreases with the filing lag (H2A). We regress the log of Total Strategic Trading on the filing lag, and firm-level and form-level control variables. The form-level control variables include the economic magnitude of the news (absolute market-adjusted returns during the filing window) and an indicator for negative news. This panel also reports regressions of the strategic trading variable for positive and negative news separately. The coefficient on the reporting lag variable is positive and significant in all regressions independent of whether the news is positive or negative, indicating that the likelihood that informed investors exploit their information advantage increases with the time between the filing and event dates. This panel also reports regressions of abnormal volume on the filing lag, and firm-level and form-level control variables. The results show the opposite pattern, namely, abnormal volume decreases with the filing lag consistent with information leakage during the event window. As expected, we also observe that the likelihood of strategic trading and abnormal volume increase with the magnitude of the news.

¹⁷ With the exception of the Average Filing Volume for 5-7-day filing lags significant at the 5% level, all figures in the table are significant at the 1% level. Further analysis indicates that the difference between the long (5-7) and short (2-4) filing lags is also significant.

To help ensure that that our sample of 8K filings are truly unanticipated and that our results arise from information leakage rather than superior forecasting ability by informed institutional traders, we further control for firm press releases and news articles. We use Raven-Pack data to compute the sum of press-releases and news articles (henceforth Media-News) for each trading day. We compute the mean Media-News over non-news days, two days prior to the event date, and the filing date. The mean Media-News is 0.35, 0.38, and 1.2, respectively, and the difference between the mean Media-News in the two days prior to the event date and non-news days is not economically significant.

The columns titled "Excluding Media Release" show the regressions of strategic trading and abnormal volume in the filing window when we exclude from the sample all 8K reports for which there was a news article either in the two days prior to the event date or during the event window. As before, we observe that number of strategic trades increases with the reporting lag, and that abnormal trading volume of institutional investors decreases with the lag. The results are unchanged when we use the entire sample of 8K reports but control for the number of news article in the regressions.¹⁸ Hence, the results of Table 3 indicate that our results are not attributable to information published in the media prior to the filing of the 8K report.

As a sensitivity analysis, we re-estimate the regressions of Table 3 for each of the two 8K form regimes separately (before and after 2004). The results (untabulated) are very similar to those reported.

Altogether, the results of this section suggest that institutional investors learn about the news as early as the event date and use their informational advantage by trading based on the sign of the news during the event window. In addition, we find evidence that some institutional investors reverse their trading position once the news become public as predicted by the models of Hirshleifer et al. (1994) and Brunnermeier (2005). Moreover, the findings regarding institutional trading are stronger, the longer the filing lag. Finally, we also document a negative relation between abnormal volume during the filing window and the filing lag, consistent with information leakage during the event window.

¹⁸ We elected to focus on the larger sample, not controlling for news reports, in most of our analyses for two reasons. First, given the large volume of data, we cannot determine whether the media content is indeed related to the event itself. Second, Raven Pack data cover less than 50% of our sample firms (6,193 vs. 12,601 firms). Nevertheless, our results hold for the smaller sample as well.

4.3 Endogeneity

The prior empirical analyses assume that the filing lag is exogenous or at least conditionally exogenous. However, as shown in Appendix I, the filing lag is potentially affected by the sign and economic magnitude of the news, which may explain lower trading activity during the filing window, especially if firms tend to accelerate (delay) the reporting of high (low) economic magnitude events. The latter results raise the specter that the filing lag is an endogenous regressor. We elect to deal with potential endogeneity of the filing lag using two research methods. The first approach addresses endogeneity using quasi-natural experiment based on the fairly exogenous changes in 8K filing requirements in 2004. The second approach is a matched design analysis based on the Covariate Balancing Propensity Score (CBPS) methodology recently developed by Imai and Ratkovic (2014). Matching has the potential to address endogeneity concerns especially if the covariates are balanced (Ho, Imai, King and Stuart 2007; Stuart 2010).

4.3.1 Quasi-Natural Experiment

In 2004, the SEC reduced the 8K report filing requirements from 15 to 4 days after the 8K event. The change was fairly exogenous to firm characteristics and activities. In particular it is unlikely that firms would have lobbied the SEC to reduce the reporting lag, especially so drastically. We use the 2004 report lag change as an exogenous shock to 8K reporting lags. Table 4, Panel A presents the results of a Difference in Differences (DiD) analysis centered on 2004. The sample includes all 8K forms that were filed in the three years prior to and after 2004.¹⁹ Columns 1 present the results of the regressions analyzing the number of strategic trading made by institutional investors. Consistent with our hypotheses, the coefficient on the variable of interest, an indicator for the post 2004 period, is negative and significant, indicating a decrease in strategic trading as a consequence of the shorter filing lag. To eliminate concerns that the strategic trading may be associated with 8K items added to the form following the 2004 change, we replicate the analysis in Column 2 restricting the sample to 8K's with

¹⁹ Note that the average filing lag in the pre period 2001-2003 (3.3 days) is significantly greater (p-value<0.01) than the lag in the post period 2005-2007 (2.85 days)

news items reported both on the old and new 8K forms (See Appendix II). The results are similar to those in Column 1.

4.3.2 Matching Analysis

The CBPS approach models treatment assignment while simultaneously optimizing covariate balance. To the extent that one obtains covariate balance across the treatment and control samples, the estimated treatment effect (of the filing lag on trading activity) will be relatively insensitive to misspecifications in the parametric model relating the trading activity to the filing gap (Ho, Imai, King and Stuart, 2007). Research in the econometrics literature indicates that CBPS estimation is effective relative to other methods in mitigating potential misspecifications from estimating parametric propensity score models (Fong et al. 2015). We match the treatment and control firms based on the estimated CBPS propensity scores. The matching analysis is executed as follows: We first restrict the sample to the most frequent 8K items – items 1.01, 5.02, and 8.01 after 2004, and item 5 prior to 2004. This is because we match observations within reported items and by year. To increase the power of the test, we match high filing lag 8K forms with low filing lag 8K forms. Specifically, we define High (Low) Filing Lag as those forms with filing lag of 6 or 7 days (2 or 3 days). Within each item and year, we match forms of High Filing Lag (treatment sample) with forms of Low Filing Lag (control sample). We facilitate the matching by estimating the CBPS propensity scores using the filing firm-level control variables (profitability, size, book-to-market, equity return volatility, leverage, and number of analysts). In addition, to account for the potential confounding effect of the economic magnitude of the event on the filing lag, we also match based on the total economic magnitude of the event, which is computed as the cumulative market adjusted return from the event date through the day after the filing date (inclusive). We select the match from the control sample based on the closest propensity score with replacement. Hence, the matching procedure results in a matched sample of 8K forms that are identical with respect to their content (i.e., item), year, economic magnitude, and characteristics of the filing firm. The only difference between forms within each pair is the filing lag.

Table 4, Panel B presents mean covariate values across high and low filing lag samples. In general, as expected the differences between the treatment and control samples for each covariate are insignificant indicating covariate balance. Results are quite similar when we examine differences in the medians. Following the

recommendation of Ho et al. (2007), we further examine the extent of covariate balance using quantile-quantile plots shown in Figure 1 for each covariate across the matched sample. These plots compare the distributions of the treatment and control samples, not just means or medians. The plots provide strong qualitative evidence that the CBPS approach is quite effective in yielding covariate balance.

Table 4, Panel C shows the matched sample estimation of the impact of the filing lag on institutional trading during the filing window, controlling for the firm level control variables and the the cumulative market adjusted return from the event date through the day after the filing date inclusive. The main variable of interest is the High Filing Lag indicator which takes the value of 1 for the treatment sample and zero for the control sample. Consistent with prior results, we observe that the high filing lag is positively associated ($p\text{-value} < 0.01$) with strategic trading by institutional investors during the event window, and negatively associated with trading volume by institutional investors during the filing window. These results indicate once again that even after controlling for the type of news and the economic magnitude of the event, reporting lags provide informed investors with the opportunity to use their information advantage. Consequently, we also observe muted trading by informed investors during the filing window.

4.4 Economic Significance Analysis and Testing H2B

The results thus far indicate that news reported via 8K forms leak prior to the filing with the SEC, thereby allowing informed investors to use their information advantage prior to the actual filing of the news, resulting in heightened (lower) trading during the event (filing) window.

We now turn to examining the economic effect of the reporting lag on price formation and trading. We measure the economic impact of the news based on the ratio of abnormal volume and equity return volatility during the filing window to the total abnormal volume and equity return volatility from the event date through the end of the filing window, respectively. Intuitively, if there is no information leakage then all the abnormal volume and volatility should occur during the filing window and the ratios should take on a value of one. Contrariwise, if information leaks, and consequently results in lower abnormal trading during the filing window, then the ratios should be less than one. Moreover, the lower the ratios, the less informative is the news.

We compute the trading ratios as follows. We first estimate the overall economic impact of the news using two proxies: (i) the sum from the event date through the day after the filing date of abnormal daily market-adjusted equity returns squared (Total Event Related Volatility), and (ii) the sum of abnormal daily trading volume scaled by total number of shares outstanding over the same period (Total Event Related Volume). We compute abnormal daily volatility (daily trading volume) as the daily volatility (daily trading volume scaled by number of shares outstanding) scaled by average daily volatility (daily volume) over non-news days during the year minus one. These abnormal measures capture the percentage change in trading relative to non-news days. Similarly, we compute abnormal trading measures over the filing window. We then compute the ratio of total abnormal daily volatility during the filing window to Total Event Related Volatility (labeled Abnormal Volatility Ratio), and similarly, the ratio of the sum of abnormal daily trading volume during the filing window to Total Event Related Volume (labeled Abnormal Volume Ratio). These latter two variables measure the proportion of the total economic impact of the news event on the equity market during the filing window. One should note that these variables are measured using the volume and return data from CRSP.²⁰

Table 5, Panel A provides the means of each of the abnormal volume and abnormal volatility ratios by reporting lag. The overall mean of the ratios is 0.36 indicating that, on average, about two thirds of the impact of the news is impounded in trading prior to the actual release of the news. Further, the panel shows monotonic decreases in the ratios over the reporting lags – from 0.48 (2 days reporting lag) to 0.17 (7 days reporting lag).²¹

The decrease in the ratios with the filing lag is expected for two reasons. First, untabulated results show that overall trading volume and equity volatility during the filing window decrease with the filing lag (numerator effect), and second, similar to the

²⁰ Note that since both the numerator and denominator are scaled by the same constant (number of shares outstanding in the case of the volume ratio and average daily volatility in the case of the volatility ratio), the volume ratio is equivalent to the ratio of total volume during the filing window scaled by total volume from the event date through one day after the filing date. Similarly, the volatility ratio is equivalent to the ratio of total equity volatility during the filing window scaled by equity volatility from the event date through one day after the filing date.

²¹ Untabulated results indicate that the rate of the incorporation of the information related to the event is independent of the reporting lag. This suggests that while institutions may learn about the filing lag, they do not seem to have superior information regarding the firm's strategy as to when to file, and hence trade immediately as they learn about the event.

trading of institutional investors, total abnormal volume and volatility (based on CRSP date) are greater on each day of the event window. Thus, the denominator of the ratio is expected to increase with the filing lag (denominator effect) leading to an overall decrease in the ratios. Notwithstanding the above, we test whether the differences in the economic magnitude are significant. Table 5, Panel B shows the regression results. We present two specifications for each ratio – one with the filing lag measured as a continuous variable and one where we include an indicator variable for each possible filing lag value. The results for the full sample show that the longer the filing lag, the less impact the news has during the filing window as the coefficient on the filing lag variable is negative and significant ($p\text{-value} < 0.01$) in both of the volume and volatility regressions. The second specification allows us to determine the actual impact of increasing the filing lag relative to the 2-day filing lag benchmark. The results indicate a monotonic decrease in the informativeness of the news over the filing lag as the coefficients on the filing lag dummies become more negative as the lag increases in both regressions. For example, the coefficient on the 3-day (7-day) filing lag in the volume regression is lower by 6.9% (29.2%) relative to the 2-day filing lag.

To mitigate the possibility that the results are affected by the economic magnitude of the event, whereby firms release less significant news later, we also present the results using the matched sample discussed above. The coefficient on the High Filing Lag variable (indicator with 1 if reporting lag is greater or equal to 6) is around -13% for both ratios, providing further support that extending the reporting lag reduces significantly the informational content of the news.

4.5 Institutional Investors

In this subsection we examine whether strategic trading is associated with innate characteristic of the institutional investor to generate superior returns. In addition, we explore whether strategic trading by institutional investors is associated with firm characteristics.

4.5.1 The Profitability of Strategic Trading

Although the 8K setting is more consistent with leakage than superior forecasting ability, nevertheless, at least some institutional investors may have the ability to identify profitable trading opportunities even in the 8K context. We explore this issue by examining whether the extent of strategic trading by institutional investors

during the year is positively associated with each of (a) the average return on strategic trades - measured as cumulative market adjusted equity return from the event date through 3 days after the filing date, and (b) the extent and profit of consistent trading. By consistent trading, we mean 8K reports for which net trading by the institutional investor during the event window is consistent with the sign of the news *and* there is no trading in the filing window. Since there is no reversal of the position, we measure the profit of consistent trades as the cumulative market-adjusted equity return in the two-week period starting on the event date.

Table 6, Panel A shows descriptive statistics. Mean two-week abnormal returns of consistent trades is 1.19% and the mean proportion of consistent trading is close to 0.51, indicating that on average 51% of the trades during the event window are consistent with the sign of the 8K news. Partitioning the institution-years based on whether the institution engaged in strategic trading and examining the properties of consistent trading, we observe that institutions that engage in strategic trading make more consistent trades in general, and have a greater proportion of consistent trades relative to all trades. However, we do not find significant difference in the two-week returns between the two groups. These results are consistent with the idea that strategic trading is indicative of an ability to identify better trading opportunities.

Panel B shows the regression results. The regressions are estimated with institutional investor fixed effects. Column (1) shows that abnormal returns from strategic trading are increasing in the number of strategic trades, suggesting that institutions that engage in more strategic trading are better able to identify profitable opportunities. Column (2) shows that the number of consistent trades in general also increase with the number of strategic trades (controlling for the total number of trades – consistent and inconsistent). Column (3) examines the two-week return to consistent trades. Similar to the results in Panel A, there is no significant relation of returns with the number of strategic trades. However, Column (4) shows that the two-week return increases with the average number of consistent trades of the institution. Hence, combining the results in Columns (2) and (4) we do find indirect evidence that institutions that engage in strategic trading generate higher returns on their consistent trading.

Overall, the results show that the number of strategic trades is indicative of the ability of institutional investors to identify and trade on more profitable opportunities, consistent with the idea that strategic trades are associated with informed trading. These

results suggest that ability to extract information leakage may be an innate characteristic of these institutional investors.

As a sensitivity analysis we replicate the analysis at the investment house level (untabulated).²² The results are very similar to those reported.

4.5.2 Firm Characteristics

Is there a relationship between strategic trading and firm characteristics? Table 7, Panel A provides descriptive statistics of selected variables for firms where institutional investors traded their equity strategically at least once during the sample period relative to firms with no strategic trading. The variables are averaged across the entire sample period. We observe that institutions engage in strategic trading in firms that are larger, more profitable, have higher growth, and greater analysts' coverage. In addition, firms subject to strategic trading file a larger number of 8K forms. Strategic trading is also associated with higher consistent trading. These statistics are consistent with several conjectures: (1) strategic traders look for news of firms with greater liquidity and with potentially lower impact of trades on prices; (2) there is greater information demand for such firms; and (3) these firms produce more material events or transactions.

Table 7, Panel B examines the link between institutional investors and firms. For each firm, 8K report and institutional investor combination, we compute the number of each of total trades, consistent trades, and strategic trading. (Note that some institutions do not trade following every 8K report.) We then compute the minimum and maximum values at the firm-institutional investor level. The resulting variables essentially tell us the range of trades by institutional investors at the firm level, or equivalently, for each firm-institutional investor, the range of the trade variables over the sample of 8K reports filed by the company. Table 7, Panel B provides the results. We observe high variation in the minimum and maximum values of each of the trading variables. For example, for some firms the number of consistent trades can be as low (high) as 0 (107), and the corresponding figures for strategic trades are 0 (50). More

²² The Ancerno data are based on the client-manager level, where the manager is typically an investment house. A client can have investments with different managers. Because most investment houses have funds with different investment characteristics (e.g. indexers, hedge funds, mutual funds) and the data fail to include a description of fund type, we treat each client-manager as an independent observation, although it is likely that the same fund is represented more than once in the data (with different clients). To alleviate this concern we examine the results at the investment house level, but the down side here is that we aggregate funds with different objectives.

importantly, for each firm we compute the range of difference in each of the trading variables. For example, the Range of Strategic Trades is the difference between the highest number of strategic trades by some institutional investor and the lowest number of strategic trades by another institutional investor at the firm level. As can be inferred from the table, there is high variation among the institutional investors that trade in the firm's shares - while some trade sporadically others specialize and trade repeatedly. For instance, at the extreme, there is a firm where certain institutional investors traded strategically 10 times whereas other institutional investors have 0 strategic trades. We observe similar results for consistent trades, with a maximum of 27 repeated interactions. Hence, the results suggest there are repeated interactions and information leakage from the firm to certain institutional investors.

4.6 Retail Investor Trades

Theory buttressed by our empirical results indicate that institutional traders have the ability, perhaps even the innate ability, to exploit and capitalize on information leakage. As a placebo test, we replicate our tests on retail investors to see if the phenomena we described is truly a function of institutional trading.

We identify retail trade following Boehmer et al. (2020). Specifically, using the TAQ data they identify retail trades as those trades that occur off-exchange (exchange code M). Our data covers the period from 2004 onwards. We further restrict the sample to end in 2010 in order to have comparable time periods with the data on institutional investors. The results (untabulated) indicate that retail investors did not trade during the event and filing window for about one third of the 8K filings.²³ Further, replicating the regressions in Table 2, we do not find heightened trading on the days during the event and filing window.

5. Additional Analyses

We also examine the impact of information leakage on overall trading, especially equity return volatility and the bid-ask spread. Untabulated results indicate that equity return volatility is significantly higher during the event window and decreases over the event window. There is again a spike in volatility on the filing date.

²³ We obtain similar results when we examine retail trades from 2004-2013, where 2013 is the end year of the 8K sample.

These results are consistent with information leakage, where informed investors trade as early as the event date resulting in higher equity volatility during the event window. Also, equity return volatility during the filing window is negatively associated with reporting lag.

Glosten and Milgrom (1985) show analytically that the specialist is expected to increase the bid-ask spread to compensate for losses suffered in trades with informed investors. Consistent with the prediction of the model, we observe an increase in the spread on the event date (untabulated). Interestingly, the estimated coefficient for the bid-ask spread is not significantly different from zero on the filing date. The relatively weaker results concerning the bid-ask spread is consistent with the evidence in Collin-Dufresne and Fos (2015) showing that measures of adverse selection could be lower in the presence of informed trading.²⁴ Similar to equity return volatility, the spread during the filing window decreases with the filing lag.

5. Conclusion

This study shows that unanticipated Form 8K reports filed with the SEC often exhibit lags raising the potential for information leakage that could be exploited by informed traders. We provide evidence that institutional investors, but not retail investors, are able to capitalize on filing lags of unanticipated 8K reports. Consistent with the theories of Hirshleifer, Subrahmanyam, and Titman (1994) and Brunnermeier (2005), we find that institutional investors trade based on the leaked sign of the event news and then (partially) reverse their trades when the news become public, thereby generating significant returns of 1.9% on average for each such strategic trade. Moreover, the likelihood of the latter trading strategy occurring increases in the filing lag. Finally, our results suggest that ability to extract and capitalize on information leakage by strategic institutional traders may be an innate characteristic of these institutional investors.

²⁴ Collin-Dufresne and Fos (2015) explain their findings by showing that informed traders trade during times of high liquidity and use limit orders.

Appendix I: Determinants of the Filing Lag

Because the impact of the filing lag on informed trading may be influenced by the determinants of the filing lag, we provide empirical evidence regarding the determinants of the filing lag in this appendix.

Empirical evidence accumulated to date indicates that managers systematically delay disclosing bad news but time or accelerate the disclosure of good news to create circumstances that are beneficial to themselves or to the firm (Kothari et al., 2009). While it is to be expected that these incentives play a lesser role as far as 8K reporting is concerned, especially after 2004 when the reporting lag is reduced to no more than 4 business days, nevertheless, the 8K filing lag appears to be longer for negative news as evidenced by the higher likelihood of 8K reporting on Fridays for negative news (Segal and Segal, 2016). In addition, the filing lag is likely positively related to the economic magnitude of the event, especially if the news is negative. This probably occurs because managers potentially require more time to ensure the veracity of larger reported magnitudes both because such events are bound to be more complex and also to minimize potential litigation risk.

Table A1 shows the results from regressing the filing lag on 8K characteristics and control variables. The main variables of interest are the sign of the news, the economic magnitude of the news and an interaction term involving both. The economic magnitude of the news is measured as the cumulative market adjusted return (CMAR) during the filing window. To test the relation between negative news and the filing lag, we include a negative news indicator, which takes the value of 1 if CMAR is negative and zero otherwise, and an interaction variable of CMAR and the negative news dummy. Given the decrease in the filing lag over the sample period, the regressions also control for the time trend. The firm-level control variables include profitability, leverage, return volatility, log of the market value of equity, book-to-market, and the number of analysts following the firm.

Columns (1) and (2) of Table A1 give the main results. Column (1) reports the results of an OLS regression, whereas Column (2) reports the results of a Poisson regression to account for the fact that the dependent variable is a count variable. The results across both regressions indicate that the economic magnitude of the event and the sign of the news are statistically significant determinants of the filing lag. Companies tend to report negative news later than positive news, and the filing lag

increases (decreases) with the economic magnitude of negative (positive) news. Hence, these results are consistent with the incentives of managers to delay the reporting of negative news, potentially because of litigation costs. In contrast, managers rush to issue positive 8K reports and the filing speed increases with the economic magnitude of the positive news. Taken together, the relation between the filing lag and the economic magnitude of the news is conditional on the sign of the news, implying that the sign of the news has a first order effect on the filing lag.

Consistent with the evidence in Table 1, we find that the filing lag decreases with time. The coefficients on the control variables indicate that firms with greater equity volatility tend to delay the reporting of 8K news whereas large firms tend to report earlier. Interestingly, we observe that the coefficient on the number of analysts following is by and large positive and significant, whereas one might expect a negative coefficient given that the number of analysts could proxy for the demand for more timely information. Notwithstanding the statistical significance, the economic magnitude appears to be low. The interquartile difference in the number of analysts increases the reporting lag by only 0.144 ($=0.018*8$) days.

The next two columns report the results when we restrict the sample to the old and new 8K forms, respectively. The results are very similar to those in Column 1, except that the coefficient on the negative news indicator in the 'New 8K' column is not significant. While the results related to the 'Old' regime indicate a larger filing lag on average, as evidenced by the intercept, and a larger sensitivity to the economic magnitude of the news, the results post 2004 also indicate that the filing lag is substantial (3.3. days), especially considering that the speed of trade execution is measured in seconds (Boehmer 2005). Also, the impact of the economic magnitude of the news is statistically significant. The difference between positive and negative news is captured by the coefficient on the interaction variable (6.054) so that a 10% negative event, for example, would be reported 0.6 days later (or equivalently one more trading day) relative to a 10% positive event.²⁵

We conduct further sensitivity analyses (untabulated). First, to eliminate the possibility that the results are due primarily to changes to the 8K report in 2004, we

²⁵ Interestingly, the coefficient on the negative news indicator is positive but not significant post 2004, indicating that negative news are not reported later than positive news. However, the negative aspect of the news is captured by CMAR, and its coefficient is negative and significant at the 1% level. Furthermore, excluding CMAR and its interaction with the negative news indicator from the regression yields a positive and highly significant coefficient ($p\text{-value}<0.01$) for the negative news indicator.

evaluate just news items reported both on the old and new 8K forms. Specifically, we include "Entry into a Material Definitive Agreement", "Termination of a Material Definitive Agreement", "Bankruptcy or Receivership", "Changes in Certifying Accountant" - Items 1.01, 1.02, 1.03, 4.01 from the new 8K forms and Item 2, 3, and 4 from the old 8K form. While there are differences among the definitions of the items across the two 8K regimes, they are close in substance. In another analysis, we restrict the sample to a particular news item for the most frequent news items. The overall results are similar for all items– the filing lag is significantly related to the sign of the news, and conditional on the sign of the new, the filing lag increases (decreases) with the economic magnitude of the news for negative (positive) news.

Table A1: Determinants of Filing Lag

| | (1) All-OLS | (2) All-Poisson | (3) Old 8K | (4) New 8K |
|---|----------------------|----------------------|----------------------|----------------------|
| Constant | 4.786*** (0.000) | | 6.671*** (0.000) | 3.339*** (0.000) |
| Market Adjusted Return | -3.607*** (0.000) | -1.231*** (0.000) | -4.790*** (0.000) | -3.136*** (0.000) |
| Negative News Indicator | 0.040*** (0.000) | 0.013*** (0.000) | 0.080*** (0.002) | 0.014 (0.189) |
| (Market Adjusted Return) X (Negative News Indicator) | 7.573*** (0.000) | 2.551*** (0.000) | 10.937*** (0.000) | 6.054*** (0.000) |
| Time | -0.108*** (0.000) | -0.036*** (0.000) | -0.391*** (0.000) | -0.043*** (0.000) |
| Return on Assets | -0.070 (0.329) | -0.038*** (0.000) | -0.086 (0.581) | -0.153** (0.014) |
| Equity Return Volatility | 2.688*** (0.000) | 0.798*** (0.000) | 4.597*** (0.002) | 1.078** (0.017) |
| Book-to-Market | -0.003 (0.820) | 0.002 (0.278) | 0.029 (0.328) | 0.008 (0.332) |
| Leverage | 0.043 (0.575) | 0.024*** (0.009) | 0.045 (0.786) | 0.055 (0.403) |
| Log Market Value of Equity | -0.103*** (0.000) | -0.029*** (0.000) | -0.035 (0.362) | -0.009 (0.533) |
| Analysts Following | 0.018*** (0.000) | 0.004*** (0.000) | -0.017** (0.020) | 0.008** (0.012) |
| Observations | 384,373 | 383,212 | 133,650 | 250,723 |
| R-squared | 0.160 | | 0.164 | 0.167 |

The table shows regressions of the filing lag on its determinants. The variables are defined in Appendix III. The first column is an OLS regression inclusive of all 8K forms in the sample. The second column replicates the first column using a Poisson regression. Column 3 (4) report results when we restrict the sample to old (new) 8K reports, before (after) Aug. 2004, respectively. Standard errors are clustered by firm. p - values are reported in parentheses. The regressions include firm, year, and item fixed effects. *, **, *** indicate significance at the 10%, 5%, and 1%, respectively.

Appendix II

New Form 8K Items Number and Description

| | |
|---|-----------|
| Item Description | |
| Entry into a Material Definitive Agreement | 1.01 |
| Termination of a Material Definitive Agreement | 1.02 |
| Bankruptcy or Receivership | 1.03 |
| Mine Safety - Reporting of Shutdowns and Patterns of Violations | 1.04 |
| Completion of Acquisition or Disposition of Assets | 2.01 |
| Results of Operations and Financial Condition | 2.02 |
| Creation of a Direct Financial Obligation or an Obligation under an Off-Balance Sheet Arrangement of a Registrant | 2.03 |
| Triggering Events That Accelerate or Increase a Direct Financial Obligation or an Obligation under an Off-Balance Sheet Arrangement | 2.04 |
| Costs Associated with Exit or Disposal Activities | 2.05 |
| Material Impairments | 2.06 |
| Notice of Delisting or Failure to Satisfy a Continued Listing Rule or Standard; Transfer of Listing | 3.01 |
| Unregistered Sales of Equity Securities | 3.02 |
| Material Modification to Rights of Security Holders | 3.03 |
| Changes in Registrant's Certifying Accountant | 4.01 |
| Non-Reliance on Previously Issued Financial Statements or a Related Audit Report or Completed Interim Review | 4.02 |
| Changes in Control of Registrant | 5.01 |
| Departure of Directors or Certain Officers; Election of Directors; Appointment of Certain Officers; Compensatory Arrangements of Certain Officers | 5.02 |
| Amendments to Articles of Incorporation or Bylaws; Change in Fiscal Year | 5.03 |
| Temporary Suspension of Trading Under Registrant's Employee Benefit Plans | 5.04 |
| Amendment to Registrant's Code of Ethics, or Waiver of a Provision of the Code of Ethics | 5.05 |
| Change in Shell Company Status | 5.06 |
| Submission of Matters to a Vote of Security Holders | 5.07 |
| Shareholder Director Nominations | 5.08 |
| Asset-Backed Securities | 6.01-6.05 |
| Regulation FD Disclosure | 7.01 |
| Other Events | 8.01 |
| Financial Statements and Exhibits | 9.01 |

Old Form 8K Items Number and Description

| | |
|--------------------------------------|---|
| Item Description | |
| Changes in Control | 1 |
| Acquisition or Disposition of Assets | 2 |
| Bankruptcy or Receivership | 3 |
| Changes in Certifying Accountant | 4 |
| Other Important Events | 5 |
| Resignation of Directors | 6 |
| Other Exhibits | 7 |
| Change in Fiscal Year | 8 |

*New form became effective August 23, 2004.

Appendix III - Variable Definition

Market Value of Equity - computed at fiscal year end

Leverage - Short term debt (DLC) plus long term debt (DLTT) scaled by average total assets (AT)

Return on Assets - Income before extraordinary items (IB) scaled by average total assets (AT)²⁶

Equity Return Volatility - standard deviation of daily equity returns during the fiscal year

Book-to-Market - Common stockholders' equity (CEQ) scaled by market value of equity at the fiscal year-end

Number of Analysts – the number of unique analysts providing at least one earnings forecast during the year.

Absolute Market Adjusted Return – computed as the absolute cumulative market adjusted equity returns in the 3 days around the filing date.

Filing Lag – number of business days between the filing and event dates of the 8K report

Log of Total Strategic Trading - log of the total number of institutional investors with the sign of net trading during the event window equal to the sign of the news (sign of market adjusted returns in the filing window) and sign of net trading during the filing window opposite to the sign of the news.

Proportion of Total Strategic Trading - Total Strategic Trading scaled by total number of institutions that traded shares during the event window

Log of Total Consistent Trading - log of the total number of institutional investors with the sign of net trading during the event window equal to the sign of the news (sign of market-adjusted returns in the filing window).

Proportion of Total Consistent Trading - computed as Total Consistent Trading scaled by total number of institutions that traded shares during the event window.

Institutional Abnormal Filing Volume - average volume of institutional investors during the filing window scaled by average daily volume of institutional investors during the year over non-news days

Overall Trading Volume - volume (CRSP) scaled by number of shares outstanding (in 00)

Daily Equity Return Volatility - market adjusted equity returns squared

Abnormal Filing Trading Volume - average trading volume during the filing window divided by average daily trading volume during the year over non-news days

Abnormal Filing Equity Return Volatility - average market adjusted equity return squared during the filing window divided by average market adjusted equity return squared during the year over non-news days

Total Cumulative Market Adjusted Return - computed as the cumulative market adjusted return from the event date through the day after the filing date (inclusive)

²⁶ In a sensitivity analysis we measure ROA as operating income scaled by total assets. Results are very similar.

Volatility Ratio - ratio of total abnormal daily market adjusted equity returns squared (abnormal daily volatility) during the filing window to total abnormal daily volatility from the event date through the day after the filing date. The abnormal daily volatility is computed as the daily market adjusted equity returns squared scaled by average daily market adjusted equity returns squared over non-news days.

Volume Ratio - ratio of total abnormal daily volume scaled by number of shares outstanding (abnormal daily volume) during the filing window to total abnormal daily volume from the event date through the day after the filing date. The abnormal daily volume is computed as the ratio of daily volume scaled by average daily volume over non-news days.

Trading Volume Event Window - ratio of the number shares traded during the event (filing) window scaled by the number of shares held by informed investors on the day prior to the 8K event date

Trading Volume Filing Window - ratio of the number shares traded during the filing window scaled by the number of shares held by informed investors on the day prior to the 8K event date

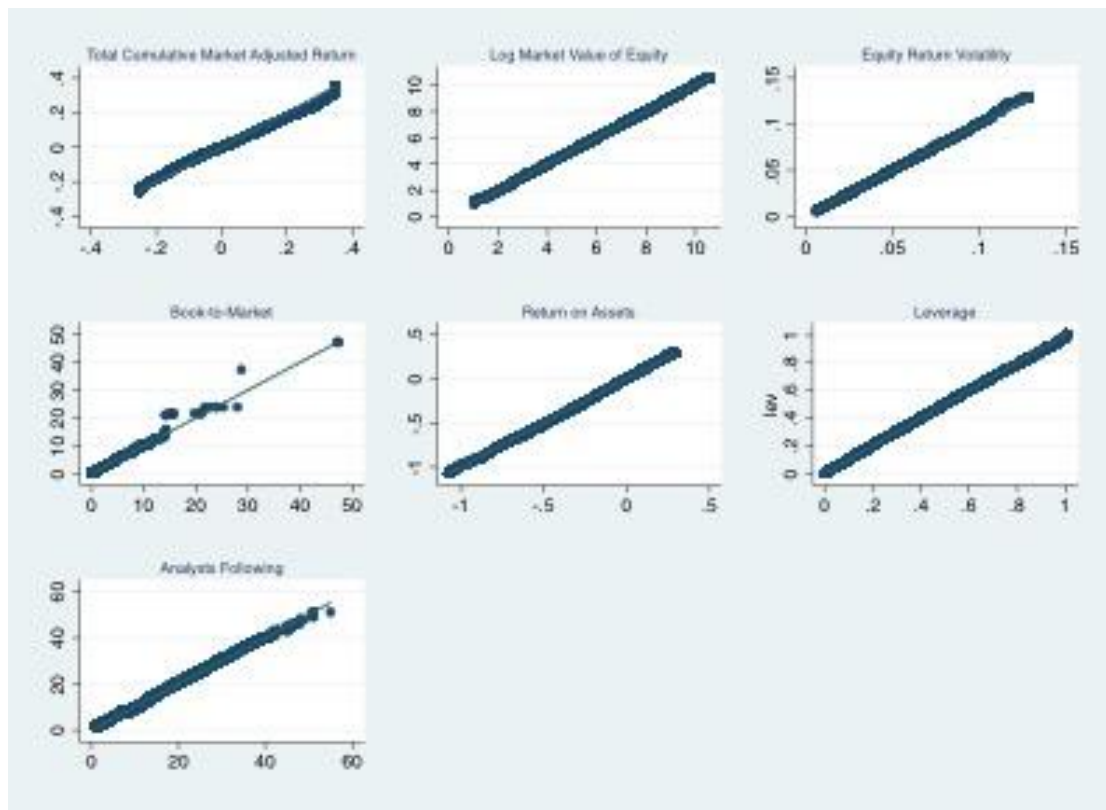
Profit - change in the share price, measured as the average share price during the filing window scaled by the average share price during the event window minus 1. If informed traders take a short position in the event window then Profit is measured as the average share price during the event window scaled by the average share price during the filing window minus 1.

References

- Aboody, D., and R. Kasznik, 2000. CEO stock option awards and the timing of voluntary disclosures, *Journal of Accounting and Economics* 29: 73–100.
- Bagehot, W. (pseudonym), 1971. The only game in town, *Financial Analysts Journal* 8:31-53
- Ben-Rephael, A., Z. Da, P.D. Easton, and R.D. Israelsen, 2017. Who pays attention to sec form 8K? (September 6). Kelley School of Business Research Paper No. 17-24. Available at SSRN: <https://ssrn.com/abstract=2942503> or <http://dx.doi.org/10.2139/ssrn.2942503>
- Bird A. and S.A. Karolyi, 2016. Do institutional investors demand public disclosure? *Review of Financial Studies* 29: 3245–3277
- Boehmer, E., 2005. Dimensions of execution quality: Recent evidence for U.S equity markets. *Journal of Financial Economics* 78: 463-704.
- Brunnermeier, M. K., 2005. Information leakage and market efficiency, *Review of Financial Studies* 18: 417-457.
- Bushee, B. J., M. J. Jung, and G. S. Miller (2017). Do Investors benefit from selective access to management? *Journal of Financial Reporting* 2: 31-61.
- Bushee, B. J., J.J. Gerakos, L.F. Lee (2018). Corporate jets and private meetings with investors. *Journal of Accounting and Economics*, 65: 358-379
- Collin-Dufresne, P., and F. Vyacheslav, 2015. Do prices reveal the presence of informed trading? *Journal of Finance* 70: 1552-1582
- Copeland, T. and D. Galai, 1983. Information effects on the bid-ask spread, *Journal of Finance* 38: 1457-69.
- Christophe, S. E., M.G. Ferri, and J. Hsieh, 2010. Informed trading before analyst downgrades: evidence from short sellers, *Journal of Financial Economics* 95: 85-106.
- Easley, D. and M. O'Hara, 1987. Price, trade size, and information in securities markets, *Journal of Financial Economics* 18: 69-90.
- Field, L., M. Lowry, and S. Shu, 2005. Does disclosure deter or trigger litigation? *Journal of Accounting and Economics* 39: 487–507.
- Fong, C., C. Hazlett, and K. Imai, 2015. Parametric and nonparametric covariate balancing propensity score for general treatment regimes. Working Paper. Stanford University, UCLA and Princeton University.
- Hirshleifer, D., A. Subrahmanyam, and S. Titman, 1994. Security analysis and trading patterns when some investors receive information before others, *Journal of Finance* 49: 1665-1698.
- Ho, D.E., K. Imai, G. King and E.A. Stuart, 2007. Matching as nonparametric preprocessing for reducing model dependence in parametric causal inference, *Political Analysis* 15: 199-236.
- Hu, G., K. M. Jo, Y. A. Wang, and J. Xie, 2018. Institutional trading and abel noser data, *Journal of Corporate Finance* 52: 143-167.
- Imai, K. and M. Ratkovic. 2014. Covariance balancing propensity score. *Journal of the Royal Statistical Society Series B*, 76: 243-263.
- Irvine, P., M. Lipson, and A. Puckett, 2007. Tipping, *Review of Financial Studies* 20: 741-768
- Glosten, L., AND P. Milgrom (1985): Bid, ask and transaction prices in a specialist market with heterogeneously informed traders, *Journal of Financial Economics* 14: 71–100.
- Kadan O, R. Michaely, P. C. Moulton, Trading in the presence of short-lived private information: Evidence from analyst recommendation changes, *Journal of Financial and Quantitative Analysis* forthcoming.
- Kothari, S. P., P. Wysocki, and S. Shu, 2009. Do managers withhold bad news? *Journal of Accounting Research*, 47: 241–276.
- Kyle, A. (1985): Continuous auctions and insider trading, *Econometrica*, 53, 1315–1335.
- Lerman, A., and J. Livnat, 2010. The new form 8K disclosures, *Review of Accounting Studies*, 15: 752-778.
- Rubin, A., B. Segal, and D. Segal, 2017. The interpretation of unanticipated news arrival and analysts' skill, *Journal of Financial and Quantitative Analysis* 52: 1491-1518.
- Segal, B., and D. Segal, 2016. Are managers strategic in reporting non-earnings related items

- in 8K filings? Evidence on timing and news bundling, *Review of Accounting Studies*, 21: 1203-1244.
- Skinner, D. J., 1994. Why firms voluntarily disclose bad news, *Journal of Accounting Research*, 32: 38–60.
- Skinner, D. J., 1997. Earnings disclosures and stockholder lawsuits. *Journal of Accounting & Economics*, 23: 249–282.
- Solomon, D., Soltes, E. 2015. What Are We Meeting for? The Consequences of Private Meetings with Investors. *Journal of Law and Economics* 58: 325–55.
- Stuart, E. A., 2010. Matching methods for causal inference: A review and look forward, *Statistical Science* 25(1):1-21.
- Subasi, M. 2014. Investor Conferences and Institutional Trading in Takeover Targets. Working paper, University of Texas at Dallas.

Figure 1: Quantile Plots



The graphs provide quantile-quantile plots for each covariate

Table 1 - Descriptive Statistics**Panel A - Firm Level**

| | Mean | STD | Q1 | Median | Q3 |
|--------------------------|--------|-------|--------|--------|-------|
| Market Value of Equity | 2,233 | 6,034 | 70 | 305 | 1,308 |
| Leverage | 0.222 | 0.216 | 0.030 | 0.172 | 0.348 |
| Return on Assets | -0.024 | 0.202 | -0.019 | 0.019 | 0.065 |
| Equity Return Volatility | 0.036 | 0.022 | 0.020 | 0.030 | 0.045 |
| Book-to-Market | 0.751 | 1.053 | 0.316 | 0.543 | 0.874 |
| Number of Analysts | 6.224 | 7.231 | 1 | 4 | 9 |

Panel B - 8K form

| Year | Number of Firms | Number of 8K forms | Absolute Market Adjusted Return | Filing Lag |
|------|-----------------|--------------------|---------------------------------|------------|
| 1996 | 2,393 | 5,290 | 0.031 | 6.026 |
| 1997 | 3,033 | 7,518 | 0.034 | 5.700 |
| 1998 | 3,360 | 8,667 | 0.039 | 5.499 |
| 1999 | 3,302 | 8,441 | 0.042 | 5.179 |
| 2000 | 3,179 | 8,373 | 0.052 | 3.372 |
| 2001 | 3,279 | 9,652 | 0.049 | 2.597 |
| 2002 | 3,733 | 12,432 | 0.044 | 2.682 |
| 2003 | 3,873 | 14,911 | 0.034 | 2.491 |
| 2004 | 4,208 | 21,805 | 0.029 | 2.416 |
| 2005 | 4,355 | 36,561 | 0.026 | 2.477 |
| 2006 | 4,275 | 35,988 | 0.025 | 2.483 |
| 2007 | 4,206 | 35,200 | 0.028 | 2.433 |
| 2008 | 4,106 | 33,430 | 0.047 | 2.384 |
| 2009 | 3,935 | 29,882 | 0.046 | 2.282 |
| 2010 | 3,832 | 30,105 | 0.030 | 2.266 |
| 2011 | 3,667 | 28,953 | 0.028 | 2.281 |
| 2012 | 3,387 | 28,238 | 0.027 | 2.184 |
| 2013 | 3,327 | 28,927 | 0.025 | 2.112 |

Panel C - Reported Items

| After Aug 2004 | | | | Before Aug 2004 | | | |
|----------------|---------------------|---------------------------------|------------|-----------------|---------------------|---------------------------------|------------|
| Item | Proportion of Forms | Absolute Market Adjusted Return | Filing Lag | Item | Proportion of Forms | Absolute Market Adjusted Return | Filing Lag |
| 1.01 | 0.199 | 0.033 | 3.102 | 1 | 0.051 | 0.039 | 3.524 |
| 1.02 | 0.017 | 0.033 | 3.156 | 2 | 0.122 | 0.038 | 7.453 |
| 1.03 | 0.000 | 0.140 | 2.500 | 3 | 0.007 | 0.053 | 4.181 |
| 2.01 | 0.021 | 0.031 | 3.074 | 4 | 0.039 | 0.045 | 4.386 |
| 2.03 | 0.050 | 0.027 | 3.209 | 5 | 0.612 | 0.041 | 3.171 |
| 2.04 | 0.002 | 0.048 | 3.190 | 6 | 0.003 | 0.054 | 3.813 |
| 2.05 | 0.007 | 0.040 | 3.032 | 8 | 0.005 | 0.042 | 3.700 |
| 2.06 | 0.003 | 0.043 | 2.999 | | | | |
| 3.01 | 0.017 | 0.058 | 3.273 | | | | |
| 3.02 | 0.020 | 0.044 | 3.122 | | | | |
| 3.03 | 0.012 | 0.040 | 2.623 | | | | |
| 4.01 | 0.007 | 0.033 | 3.464 | | | | |
| 4.02 | 0.003 | 0.044 | 3.003 | | | | |
| 5.01 | 0.002 | 0.036 | 2.700 | | | | |
| 5.02 | 0.232 | 0.030 | 3.135 | | | | |
| 5.03 | 0.039 | 0.030 | 3.049 | | | | |
| 5.05 | 0.002 | 0.027 | 3.441 | | | | |
| 5.04 | 0.002 | 0.025 | 1.656 | | | | |
| 5.07 | 0.049 | 0.024 | 2.803 | | | | |
| 5.06 | 0.000 | 0.017 | 3.667 | | | | |
| 5.08 | 0.000 | 0.022 | 1.969 | | | | |
| 6.01 | 0.000 | 0.005 | 1.500 | | | | |
| 7.01 | 0.189 | 0.032 | 1.192 | | | | |
| 8.01 | 0.293 | 0.033 | 1.724 | | | | |

Panel A shows descriptive statistics at the firm-year level. Panel B reports statistics on the number of 8K forms, their economic significance measured by the absolute market adjusted equity return in the three days centered on the filing date, and mean filing lag. Panel C presents statistics on the frequency, economic significance, and filing lag of the various items reported via the 8K form. See Appendix II for a list of reported items.

Table 2 - Institutional Daily Volume Trading

| | Full Sample | 2 Days | 3 Days | 4 Days | 5 Days | 6 Days | 7 Days | Negative Events | Positive Events |
|----------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| Constant | 0.340*** (0.002) | 0.347*** (0.002) | 0.349*** (0.001) | 0.342*** (0.002) | 0.345*** (0.002) | 0.344*** (0.002) | 0.341*** (0.002) | 0.341*** (0.002) | 0.337*** (0.002) |
| DayM2 | -0.008 (0.294) | -0.004 (0.832) | -0.013 (0.649) | -0.019 (0.460) | 0.030 (0.264) | 0.028 (0.261) | 0.002 (0.940) | -0.020** (0.019) | -0.021** (0.016) |
| DayM1 | 0.008 (0.331) | 0.013 (0.503) | -0.035 (0.201) | -0.026 (0.314) | 0.045 (0.104) | 0.030 (0.251) | -0.000 (0.995) | 0.008 (0.361) | 0.001 (0.914) |
| Day_0 | 0.120*** (0.000) | 0.151*** (0.000) | 0.117*** (0.000) | 0.082*** (0.003) | 0.140*** (0.000) | 0.106*** (0.000) | 0.093*** (0.000) | 0.115*** (0.000) | 0.107*** (0.000) |
| Day_1 | 0.231*** (0.000) | 0.398*** (0.000) | 0.264*** (0.000) | 0.176*** (0.000) | 0.174*** (0.000) | 0.170*** (0.000) | 0.117*** (0.000) | 0.218*** (0.000) | 0.225*** (0.000) |
| Day_2 | 0.079*** (0.000) | | 0.107*** (0.000) | 0.066** (0.039) | 0.101*** (0.000) | 0.069*** (0.008) | 0.065** (0.011) | 0.069*** (0.000) | 0.069*** (0.000) |
| Day_3 | 0.056*** (0.000) | | | 0.069** (0.032) | 0.090** (0.036) | 0.071*** (0.007) | 0.051** (0.041) | 0.047*** (0.003) | 0.043*** (0.010) |
| Day_4 | 0.014 (0.389) | | | | 0.012 (0.774) | -0.180 (0.311) | 0.036 (0.168) | 0.017 (0.427) | -0.011 (0.628) |
| FDay_0 | 0.100*** (0.000) | 0.177*** (0.000) | 0.103*** (0.001) | 0.091*** (0.002) | 0.132*** (0.000) | 0.075*** (0.003) | 0.044* (0.073) | 0.074*** (0.000) | 0.106*** (0.000) |
| FDay_1 | 0.039*** (0.000) | 0.048* (0.058) | 0.038 (0.260) | 0.063** (0.045) | 0.065** (0.034) | 0.056** (0.030) | 0.003 (0.899) | 0.025* (0.065) | 0.032** (0.019) |
| Negative News Indicator | -0.024*** (0.001) | -0.017 (0.332) | -0.011 (0.623) | -0.011 (0.566) | -0.028 (0.189) | -0.049*** (0.006) | -0.034* (0.053) | | |
| Return on Assets | 0.232*** (0.000) | 0.241*** (0.000) | 0.246*** (0.000) | 0.245*** (0.000) | 0.243*** (0.000) | 0.249*** (0.000) | 0.237*** (0.000) | 0.240*** (0.000) | 0.237*** (0.000) |
| Equity Return Volatility | 7.093*** (0.000) | 7.146*** (0.000) | 7.167*** (0.000) | 7.195*** (0.000) | 7.173*** (0.000) | 7.191*** (0.000) | 7.232*** (0.000) | 7.131*** (0.000) | 7.156*** (0.000) |
| Book-to-Market | -0.061*** (0.000) | -0.063*** (0.000) | -0.063*** (0.000) | -0.062*** (0.000) | -0.063*** (0.000) | -0.063*** (0.000) | -0.063*** (0.000) | -0.062*** (0.000) | -0.061*** (0.000) |
| Leverage | 0.157*** (0.002) | 0.157*** (0.003) | 0.156*** (0.003) | 0.154*** (0.003) | 0.158*** (0.002) | 0.159*** (0.002) | 0.152*** (0.003) | 0.152*** (0.004) | 0.161*** (0.002) |
| Log Market Value of Equity | 0.060*** (0.000) | 0.059*** (0.000) | 0.058*** (0.000) | 0.060*** (0.000) | 0.059*** (0.000) | 0.059*** (0.000) | 0.060*** (0.000) | 0.060*** (0.000) | 0.060*** (0.000) |
| Analysts Following | -0.007*** | -0.007*** | -0.007*** | -0.007*** | -0.007*** | -0.007*** | -0.007*** | -0.007*** | -0.007*** |

| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
|--------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Observations | 4,295,000 | 3,898,874 | 3,871,171 | 3,874,507 | 3,876,726 | 3,901,007 | 3,906,603 | 4,082,063 | 4,073,642 |
| R-squared | 0.042 | 0.042 | 0.042 | 0.042 | 0.042 | 0.042 | 0.042 | 0.042 | 0.042 |

The table reports regression of institutional daily volume trading on timing indicator variables. The dependent variable is volume scaled by number of shares outstanding (in 000). DayMt (Day_t) is an indicator for date t prior to (after) the Event Date. FDay_t is an indicator for date t after the Filing Date. The Columns i Days (i=2-7) show regressions where we exclude from the sample the trading days around 8K filing with filing lag different from i. The variables are defined in Appendix III. The regressions include firm, year, and item fixed effects. Standard errors are clustered by firm. p values are reported in parentheses. *, **, *** indicate significance at the 10%, 5%, and 1%, respectively.

Table 3 - Strategic Trading by Institutional Investors

Panel A: Univariate Statistics

| Filing Lag | Log of Total Strategic Trading | Proportion of Total Strategic Trading | Inst. Abnormal Filing Volume |
|------------|--------------------------------|---------------------------------------|------------------------------|
| 2 | 0.202 | 0.141 | 1.199 |
| 3 | 0.221 | 0.123 | 1.098 |
| 4 | 0.246 | 0.105 | 1.104 |
| 5 | 0.261 | 0.090 | 1.049 |
| 6 | 0.268 | 0.082 | 1.057 |
| 7 | 0.228 | 0.063 | 1.069 |
| Average | 0.235 | 0.110 | 1.107 |

Panel B: Regressions of Strategic Trading on Reporting Lag

| | Log of Strategic Trading | | | | Abnormal Volume Filing Window | | | |
|-----------------------------|--------------------------|----------------------|----------------------|--------------------------|-------------------------------|----------------------|----------------------|--------------------------|
| | All | Negative News | Positive News | Excluding Media Releases | All | Negative News | Positive News | Excluding Media Releases |
| Constant | -0.862*** (0.000) | -0.825*** (0.000) | -0.955*** (0.000) | -0.726*** (0.000) | 1.272*** (0.000) | 1.001*** (0.001) | 1.501*** (0.000) | 0.994*** (0.002) |
| Reporting Lag | 0.026*** (0.000) | 0.025*** (0.000) | 0.027*** (0.000) | 0.023*** (0.000) | -0.025*** (0.000) | -0.021*** (0.001) | -0.025*** (0.000) | -0.021*** (0.008) |
| Abs. Market Adjusted Return | 0.160*** (0.000) | 0.242*** (0.000) | 0.142*** (0.002) | 0.110** (0.041) | 6.466*** (0.000) | 9.291*** (0.000) | 5.471*** (0.000) | 7.243*** (0.000) |
| Negative News Indicator | -0.020*** (0.000) | | | -0.019*** (0.000) | -0.033** (0.011) | | | -0.030 (0.163) |
| Return on Assets | 0.001 (0.953) | -0.009 (0.669) | 0.005 (0.821) | -0.003 (0.900) | -0.033 (0.737) | 0.128 (0.349) | -0.012 (0.931) | -0.132 (0.415) |
| Equity Return Volatility | 0.261 (0.201) | 0.050 (0.825) | 0.586** (0.028) | 0.308 (0.188) | -4.259*** (0.000) | -4.399*** (0.000) | -4.161*** (0.000) | -5.551*** (0.000) |
| Book-to-Market | 0.008* (0.068) | 0.005 (0.152) | 0.011 (0.138) | 0.010*** (0.000) | -0.019 (0.229) | -0.002 (0.929) | -0.029 (0.132) | -0.001 (0.942) |
| Leverage | -0.027 (0.125) | -0.057*** (0.009) | 0.005 (0.822) | -0.038 (0.132) | 0.043 (0.601) | 0.042 (0.727) | 0.121 (0.305) | -0.012 (0.924) |
| Log Market Value of Equity | 0.078*** (0.000) | 0.074*** (0.000) | 0.085*** (0.000) | 0.068*** (0.000) | -0.015 (0.459) | -0.010 (0.699) | -0.022 (0.443) | -0.011 (0.733) |
| Analysts Following | 0.000 (0.992) | 0.001 (0.627) | -0.001 (0.560) | 0.000 (0.890) | -0.001 (0.822) | 0.002 (0.640) | -0.003 (0.533) | 0.005 (0.307) |
| Observations | 91,351 | 46,742 | 44,609 | 39,085 | 64,742 | 32,809 | 31,933 | 26,733 |
| R-squared | 0.054 | 0.054 | 0.056 | 0.051 | 0.023 | 0.034 | 0.020 | 0.030 |

The table reports results of strategic trading by institutional investors and institutional trading volume during the 8K filing window. Panel A reports the mean of the trading variables by reporting lag. Panel B presents the regression results. The dependent variables are the Log of Total Strategic Trading, and Institutional Abnormal Filing Volume, respectively. The regressions are estimated using OLS with firm, year, and item fixed effects. Standard errors are clustered by firm. p values are reported in parentheses. *, **, *** indicate significance at the 10%, 5%, and 1%, respectively.

Table 4: Endogeneity Analysis

Panel A: Difference in Difference Analysis Around the 2004 Change in 8K Filing Requirements

| | Log of Total Strategic Trading | Log of Total Strategic Trading Similar News Items |
|--------------|-----------------------------------|---|
| Constant | -0.113*** (0.001) | -0.150** (0.021) |
| Post2004 | -0.092*** (0.000) | -0.160*** (0.000) |
| Controls | YES | |
| Observations | 95,518 | 22,493 |
| R-squared | 0.028 | 0.026 |

Panel B: Mean Covariates across High and Low Filing Lag Samples

| | Total Cumulative Market Adjusted Return | Log Market Value of Equity | Equity Return Volatility | Book-to- Market | Return on Assets | Leverage | Analysts Following |
|-----------------|---|----------------------------------|--------------------------------|--------------------|---------------------|----------|-----------------------|
| High Filing Lag | 0.004 | 6.478 | 0.033 | 0.664 | -0.028 | 0.239 | 8.712 |
| Low Filing Lag | 0.003 | 6.482 | 0.033 | 0.665 | -0.028 | 0.240 | 8.765 |
| Difference | 0.000 | -0.004 | 0.000 | -0.002 | 0.000 | -0.001 | -0.053 |

Panel C: Regressions of Trading Variables during the Filing Window on the Filing Lag

| | Log of Total Strategic Trading | Inst. Abnormal Filing Volume |
|-----------------|--------------------------------------|---------------------------------|
| Constant | -0.269*** (0.001) | 1.145** (0.035) |
| High Filing Lag | 0.098*** (0.000) | -0.100*** (0.007) |
| Controls | | YES |
| Observations | 28,141 | 24,624 |
| R-squared | 0.033 | 0.003 |

The table reports results of endogeneity analyses. Panel A reports results of Differences-in-Differences analysis around the change in 8K filing requirements in 2004. We restrict the sample to 8K reports filed 2001-2003 inclusive and 2005-2007 inclusive (post period). The first column shows the regression results for the entire sample, and the second column shows regression results when we restrict the sample of 8K to include news items reported both on the old and new 8K forms. Specifically, we include "Entry into a Material Definitive Agreement", "Termination of a Material Definitive Agreement", "Bankruptcy or Receivership", "Changes in Certifying Accountant" - Items 1.01, 1.02, 1.03, 4.01 from the new 8K forms and Item 2, 3, and 4 from the old 8K form. Panels B and C shows results of matching analysis. The matching analysis is executed as follows: We first restrict the sample to the most frequent 8K items – item 1.01, 5.02, 8.01 after 2004, and item 5 prior to 2004. We define High (Low) Filing Lag as those forms with filing lag of 6 or 7 days (2 or 3 days). Within each item and year, we match forms with High Filing Lag (treatment sample) with forms of Low Filing Lag (control sample). We facilitate the matching by estimating the CBPS propensity scores using the filing firm-level control variables (profitability, size, book-to-market, equity return volatility, leverage, and number of analysts), and the total economic magnitude of the event, which is computed as the cumulative market adjusted return from the event date through the day after the filing date (inclusive). We select the match from the control sample based on the closest propensity score with replacement. The regressions include firm, year, and item fixed-effects. Standard errors are clustered by firm. p values are reported in parentheses. *, **, *** indicate significance at the 10%, 5%, and 1%, respectively.

Table 5 – Economic Significance Analysis

Panel A: Impact of Filing Lag on Economic Effect of the News – Descriptive Statistics

| Reporting Lag | Abnormal Volume Ratio | Abnormal Volatility Ratio |
|---------------|-----------------------|---------------------------|
| 2 | 0.483 | 0.472 |
| 3 | 0.399 | 0.416 |
| 4 | 0.349 | 0.359 |
| 5 | 0.335 | 0.331 |
| 6 | 0.265 | 0.276 |
| 7 | 0.177 | 0.182 |
| Average | 0.357 | 0.360 |

Panel B: Multivariate Regressions of Volume and Volatility Ratios

| | Full Sample | | | | Matched Sample | |
|-----------------------------|---------------------------------|---------------------------------|-------------------------------------|-------------------------------------|----------------------|----------------------|
| | Volume Reporting Lag Continuous | Volume Reporting Lag Indicators | Volatility Reporting Lag Continuous | Volatility Reporting Lag Indicators | Volume | Volatility |
| Constant | 0.547*** (0.000) | 0.472*** (0.000) | 0.486*** (0.000) | 0.414*** (0.000) | 0.366*** (0.000) | 0.336*** (0.000) |
| Filing Lag | -0.051*** (0.000) | | -0.048*** (0.000) | | | |
| Filing Lag_3 | | -0.069*** (0.000) | | -0.061*** (0.000) | | |
| Filing Lag_4 | | -0.124*** (0.000) | | -0.114*** (0.000) | | |
| Filing Lag_5 | | -0.144*** (0.000) | | -0.132*** (0.000) | | |
| Filing Lag_6 | | -0.201*** (0.000) | | -0.189*** (0.000) | | |
| Filing Lag_7 | | -0.292*** (0.000) | | -0.276*** (0.000) | | |
| High Filing Lag | | | | | -0.139*** (0.000) | -0.127*** (0.000) |
| Abs. Market Adjusted Return | -0.476*** (0.000) | -0.471*** (0.000) | -1.193*** (0.000) | -1.187*** (0.000) | -0.005 (0.655) | 0.013 (0.416) |
| Negative News Indicator | -0.001 (0.476) | -0.001 (0.484) | -0.003** (0.037) | -0.003** (0.039) | -0.208* (0.077) | -0.470** (0.016) |
| Return on Assets | 0.005 (0.266) | 0.005 (0.259) | 0.022*** (0.001) | 0.022*** (0.001) | -0.000 (0.872) | -0.007*** (0.009) |
| Equity Return Volatility | -0.001 (0.440) | -0.001 (0.500) | -0.002 (0.178) | -0.002 (0.203) | -0.025** (0.016) | -0.016 (0.300) |
| Book-to-Market | 0.681*** (0.000) | 0.679*** (0.000) | 1.692*** (0.000) | 1.691*** (0.000) | 0.003 (0.254) | 0.003 (0.453) |

| | | | | | | |
|----------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| Leverage | -0.007*** (0.000) | -0.006*** (0.000) | -0.016*** (0.000) | -0.016*** (0.000) | 0.702*** (0.000) | 1.685*** (0.000) |
| Log Market Value of Equity | 0.000* (0.066) | 0.000 (0.113) | 0.000 (0.565) | 0.000 (0.664) | -0.006*** (0.003) | -0.020*** (0.000) |
| Analysts Following | 0.547*** (0.000) | 0.472*** (0.000) | 0.486*** (0.000) | 0.414*** (0.000) | -0.139*** (0.000) | -0.127*** (0.000) |
| Observations | 175,080 | 175,080 | 175,266 | 175,266 | 83,729 | 83,744 |
| R-squared | 0.186 | 0.190 | 0.134 | 0.136 | 0.159 | 0.116 |

The table reports economic significance analysis of the impact of the reporting lag on volume and volatility during the filing window. The Matched Sample is the same sample used in Table 4. Filing_Lag_i (i=3-7) is an indicator with 1 if the filing lag equals to i. The regressions include firm, year, and item fixed-effects. Standard errors are clustered by firm. p values are reported in parentheses. *, **, *** indicate significance at the 10%, 5%, and 1%, respectively.

Table 6: Institutional Traders – Strategic and Consistent Trading

Panel A: Univariate Statistics

| Consistent Trading | | | | | |
|------------------------------------|--------|-------|-------|--------|-------|
| | N | Mean | Q1 | Median | Q3 |
| Two Weeks Return (%) | 17,893 | 1.190 | 0.000 | 0.849 | 2.153 |
| Log of Number of Consistent Trades | 17,893 | 2.136 | 1.099 | 1.946 | 2.944 |
| Proportion of Consistent Trading | 17,893 | 0.512 | 0.418 | 0.500 | 0.600 |

Consistent Trading Conditioned on Strategic Trading

| | Two Weeks Return (%) | Log of Number of Consistent Trades | Proportion of Consistent Trading |
|---|-------------------------|---------------------------------------|-------------------------------------|
| Investors with Zero Strategic Trades | 1.184 | 1.818 | 0.511 |
| <u>Investors with Positive Strategic Trades</u> | 1.224 | 3.866 | 0.519 |
| Difference | 0.040 | 2.048*** | 0.008** |

Panel B: Regressions

| Dependent Variables: | Strategic Trading Return (%) | Log of Number of Consistent Trades | Two Weeks Return (%) | Two Weeks Return (%) |
|------------------------------------|------------------------------|------------------------------------|----------------------|----------------------|
| | (1) | (2) | (3) | (4) |
| Constant | 0.005*** (0.000) | -0.218*** (0.000) | 0.203** (0.013) | 0.827*** (0.000) |
| Log of Number of Strategic Trades | 0.075*** (0.000) | 0.094*** (0.000) | 0.022 (0.534) | |
| Log of Number of Total Trades | | 0.869*** (0.000) | | |
| Log of Number of Consistent Trades | | | | 0.170*** (0.000) |
| Observations | 17,893 | 16,620 | 17,893 | 17,893 |
| R-squared | 0.154 | 0.943 | 0.020 | 0.020 |

The table shows results of the relation between the consistent trading and strategic trading as well as the consequent equity returns. The analysis is at the institutional investor level. Panel A provides univariate results. Two Weeks Return is the cumulative market adjusted return over the two-week period from the event date. Log of Number of Consistent Trades refers to the number of consistent trades made by the institutional investor during the year, where consistent trade is defined as 8K report where the sign of net trading by the institutional investor during the event window equals to the sign of the news (sign of market adjusted returns in the filing window). Proportion of Consistent Trading is the proportion of consistent trades out of all trading made by the institutional investor during the event window of all 8K reports where the investor traded during the year.

Panel B presents regressions results. Log of Number of Total Trades is the log of the total number of 8K reports where the institutional investor traded during the year. Standard errors are clustered by institutional investor. p-values are reported in parentheses. The regressions include institutional investor fixed effect. *, **, *** indicate significance at the 10%, 5%, and 1%, respectively.

Table 7: Firm Characteristics and Nature of Relation with Institutional Investors

Panel A: Firm Characteristics

| Strategic Trades | Number of 8K reports | Filing Lag | Number of Strategic Trades | Number of Consistent Trades | Proportion of Consistent Trades | Log Market Value of Equity | Analysts Following | Book-to- Market | Return on Assets |
|-------------------|-------------------------|------------|-------------------------------|--------------------------------|------------------------------------|-------------------------------|-----------------------|--------------------|---------------------|
| Zero | 2.592 | 4.075 | 0.000 | 4.257 | 0.488 | 5.649 | 2.638 | 0.732 | -0.029 |
| Greater than zero | 5.183 | 3.932 | 3.836 | 33.838 | 0.522 | 7.532 | 5.800 | 0.565 | 0.030 |
| Difference | 2.591 | -0.142 | 3.836 | 29.581 | 0.034 | 1.883 | 3.162 | -0.167 | 0.059 |

Panel B: Relation between the Firm and Institutional Investors

| | Mean | Min | Q1 | Median | Q3 | Max |
|-------------------------|--------|-----|----|--------|----|-----|
| Number of Institutions | 49.992 | 1 | 6 | 25 | 69 | 334 |
| Min. Total Trades | 1.045 | 1 | 1 | 1 | 1 | 3 |
| Max. Total Trades | 10.122 | 1 | 3 | 7 | 14 | 51 |
| Range Total Trades | 9.060 | 0 | 2 | 6 | 13 | 50 |
| Min. Strategic Trades | 0.000 | 0 | 0 | 0 | 0 | 0 |
| Max. Strategic Trades | 1.638 | 0 | 0 | 1 | 2 | 10 |
| Range Strategic Trades | 1.634 | 0 | 0 | 1 | 2 | 10 |
| Min. Consistent Trades | 0.115 | 0 | 0 | 0 | 0 | 2 |
| Max. Consistent Trades | 5.598 | 0 | 2 | 4 | 8 | 27 |
| Range Consistent Trades | 5.475 | 0 | 1 | 4 | 8 | 27 |

Panel A provides descriptive statistics of selected variables for firms where institutional investors traded their equity strategically at least once during the sample period vis a vis firms with no strategic trading. The variables are averaged across the entire sample period. In addition, the panel provides statistics related to trading around 8K filings by institutional investors. Panel B reports descriptive statistics related to the minimum, maximum, and range (difference between maximum and minimum) of total, strategic, and consistent trades at the firm-institutional investor level. Specifically, for each firm-8K form-institutional investor we compute the number of each of total trades, consistent trades, and strategic trading trades during the sample period. We then compute for each firm-institutional variable the minimum, maximum, and range at the firm level.