Selective Disclosure and the Role of Form 8-K in the Post-Reg FD Era

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Abstract: In this study, we investigate whether firms' selective disclosure to the investment community still provides information advantage to sell-side analysts in the post-Reg FD era. Using cross-sectional variation in the firm's social connections with the investment community to identify firms more prone to selective disclosure, we show that for firms with more social connections to the investment community, both the precision and the proportion of analysts' private information are higher in the period prior to non-earnings-announcement 8-K filings, consistent with selective disclosure to the investment community. We also examine the ability of Form 8-K filings to mitigate the information advantage arising from selective disclosures. After the 8-K filing we find no significant difference in the precision and proportion of private information, suggesting 8-Ks mitigate some of the information advantage provided by selective disclosure. Additional analyses reveal that the effect of 8-Ks on leveling the information playing field is primarily driven by 8-Ks filed specifically to comply with Reg FD. In comparison, the precision of analysts' common information is not significantly associated with firms' social connections.

1. Introduction

Regulation Fair Disclosure (Reg FD) prohibits selective disclosure of material information to the professional investment community and encourages broad public disclosure. Recent evidence implies that corporate management and investment professionals have adapted to the new disclosure environment under Reg FD and are now communicating through broader and more diverse channels (e.g., Green, James, Markov and Subasi 2014; Brown, Call, Clement and Sharp 2015). This study investigates whether firms' selective disclosure to the investment community still provides an information advantage to sell-side analysts in the post-Reg FD era and tests whether public disclosure on Form 8-Ks mitigates this advantage.

We use "selective disclosure" broadly in this study to refer to private communication between corporate management and the investment community about any non-public information - material or non-material. Reg FD requires that when a firm selectively discloses *material* non-public information to influential securities market professionals or security holders, it must make that information public by filing a Form 8-K (Current Report) under specific item categories or by other methods that can effect broad and non-exclusionary distribution of that information. Reg FD requires simultaneous public disclosure when selective disclosures are intentional and prompt public disclosure otherwise. Anecdotally, Reg FD-specific 8-Ks are generally associated with highly visible, intentional disclosure events such as scheduled investor visits to firm headquarters, broker-hosted investor conferences, analyst days and non-deal road shows rather than selective disclosures to individuals. However, under Reg FD, corporate management is not prohibited from "disclosing a non-material piece of information to an analyst, even if, unbeknownst to the issuer, that piece helps the analyst complete a 'mosaic' of

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information that, taken together, is material."[1] Thus, information contained in 8-K filings could have been selectively disclosed prior to the public disclosure. We posit that if selective disclosure still benefits investment professionals in the post-Reg FD era, we are likely to observe the benefit in the information advantage of sell-side analysts who constitute a key group of investment professionals.

It is challenging for researchers and regulators to directly observe or verify selective disclosure from public records for a large sample of firms (Soltes 2014). As one analyst interviewed by Brown et al. (2015) describes, the communication between analysts and corporate management in the post-Reg FD era is occurring "everywhere" now that "management has figured out how to 'paper things up' [with an 8-K]". Given recent research that considers social connections as an important channel of information transfer (e.g., Cohen, Frazzini and Malloy 2008, 2010; Engelberg, Gao and Parsons 2012; Cai, Walking and Yang 2014), we rely on firms' social connections to the investment community to identify firms more prone to selective disclosure. As expected, firms with more social connections to the investment community are more likely to engage in selective disclosure of both material and non-material information post Reg FD.

Our research setting also allows us to examine whether public disclosures on Form 8-Ks reduce or eliminate information advantage arising from selective disclosure. The expansion of reportable events and acceleration of filing date in 2004 (Rule 33-8400) increased the visibility of and scrutiny around 8-K filings. With revisions to rules on 8-K filings, the Securities and Exchange Commission (SEC) intends for 8-K filings to provide better and faster public disclosures that help level the information playing field. It remains an empirical question whether 8-K filings serve the intended purpose rather than simply as a formality under the post-Reg FD

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[1] http://www.sec.gov/rules/final/33-7881.htm

disclosure environment especially when some private communication is still permitted under the "mosaic" exception to Reg FD.

We focus on non-earnings-announcement 8-Ks because the common practice of blackout periods before earnings announcements likely deters the flow of private information before earnings-announcement 8-K filings. Non-earnings-announcement 8-K filings provide a strong setting to investigate analyst information advantage as these types of 8-Ks are filed at irregular intervals allowing selective disclosure to play a more important role. We assume that analysts' information advantage manifests itself as the idiosyncratic or private information component imbedded in their earnings forecasts. We hypothesize that analysts following firms with more social connections to the investment community will have higher proportion of private information and/or more precise private information before public disclosures on 8-Ks.

We measure a non-investment firm's social connections to the investment community (*Connection*) as the number of unique investment firms that the non-investment firm's CEO, CFO, or board members have connections with either through education or employment. All non-investment firms are classified as high, medium or low connection firms based on tercile rankings of standardized *Connection*.

We find that high connection firms file more 8-Ks and more Reg FD-specific 8-Ks than low connection firms in the post-Reg FD periods. High connection firms also experience a bigger increase in the overall number of 8-Ks filed when they transition from the pre-Reg FD period to the early post-Reg FD period of 2001-2003. The increases in the overall number of 8-Ks coincide with the filings of Reg FD-specific 8-Ks in 2001-2003. These patterns corroborate the anecdotal evidence that firms more prone to selective disclosure continue to make selective disclosures to the investment community and "paper things up [with an 8-K]".

Relying on the theoretical model in Barron, Kim, Lim and Stevens (1998) (hereafter BKLS) and the empirical implementation in prior studies (e.g., Barron, Byard, and Kim 2002; Barron, Byard and Yu 2008), we construct proxies for the proportion and the precision of analysts' private information before and after non-earnings-announcement 8-K filings. The BKLS model allows us to separate out the private information component that we otherwise cannot infer from analyst forecast accuracy. We use a matched sample research design where low connection firms are matched to high connection firms with the closest size to minimize the effect of firm size on analyst information advantage.

Univariate results show that for high connection firms, a higher percentage of analyst information comes from private sources both before and after 8-Ks are filed. Filing of 8-Ks results in improvements in the precision of both private and common information regardless of firms' social connections. However, analysts covering low connection firms benefit more from public disclosure as they see more improvement in the average precision of their private information. Multivariate regression results show that after controlling for firm characteristics and the information content of 8-K filings, analysts who cover firms with more social connections to the investment community have higher proportion of private information and more precise private information prior to 8-K filings but not after. In comparison, the precision of common information is not statistically associated with social connections either prior to or after the 8-K filings, suggesting that social connections are not simply a proxy for other firm attributes that indicate better public disclosure.

Additional subsample analyses reveal that the effect of 8-Ks on leveling the information playing field is primarily driven by 8-Ks filed to comply with Reg FD. For non-Reg FD-specific 8-Ks where the "mosaic" exception to Reg FD is likely to play a more important role in

information transfer, the precision of analyst private information is still higher for high connection firms even after the 8-Ks are filed. Additional exploratory tests also confirm that the market perceives higher risks of informed trading for high connection firms even after 8-K filings. Bid-ask spreads increase more from the pre- to the post-filing period when the 8-K filings are more informative and this increase is greater for high connection firms.

This study makes important contributions to the literature. It extends a growing stream of literature examining the effect of social networks on the financial markets (e.g., Cai et al. 2014; Cohen et al. 2010). Our results that analysts covering high connection firms have an information advantage prior to 8-K filings, combined with the finding that high connection firms file more Reg FD-specific 8-Ks, are consistent with the conjecture that in the post-Reg FD era, private communications between corporate management and the investment community likely occur through broad and diverse social networks.

This study also adds to the recent research that investigates various channels through which investment professionals seek information edge in the post-Reg FD era (e.g., Green et al. 2014; Soltes 2014). Prior to Reg FD, selective disclosure is part of the official corporate disclosure channel and analysts' private and public sources of information are entangled. Findings in this study suggest that after Reg FD, analysts' information edge comes from their idiosyncratic information discovery for which social connections play a critical role. Although these private interactions are not necessarily in violation of Reg FD under the "mosaic" theory, the breadth and the expansive nature of today's social networks make "leveling the playing field" increasingly difficult. On the brighter side, filings of 8-Ks pursuant to Reg FD appear to attenuate the link between social connections and analysts' information advantage. Thus, Reg FD-specific 8-Ks benefit analysts who cover firms less prone to selective disclosure and most

likely benefit the retail investors as well. This study thus also contributes to research on 8-K filings which is rather limited in comparison to research on periodic reports such as 10-K and 10-Q.

Finally, a few caveats are in order. Our results do not speak to variations in information advantage across analysts covering the same firm. Cross-sectional variation in firms' selective disclosure practice is at the heart of our study and we triangulate our evidence on selective disclosure using 8-K filings and analyst information advantage. We also acknowledge that other investment professionals (Huang, Lu and Wang 2014) such as buy-side analysts likely benefit from selective disclosure stemming from firms' social connections to the investment community as well and we leave that for future research.

2. Literature review and hypotheses

In this section, we review the background on Form 8-K, discuss the literature on analyst information advantage and the effect of social connections on financial markets, and develop our hypotheses.

2.1. Reg FD and Form 8-K filings

Since the passage of the Securities Exchange Act of 1934, the SEC has required firms to file Form 8-Ks, the "Current Report", to publicly disclose material information events that occur between periodic reports (10-Q and 10-K). Reportable events include (but are not limited to) items specified by the SEC such as auditor changes, resignation of directors or officers, material acquisition or disposition of assets, as well as material events unspecified by the SEC. Many of these events have significant implications for investors' valuation of firms' future earnings.

Enacted in 2000, Reg FD requires that when a firm selectively discloses material non-public information to securities market professionals (for example, at investor conferences or road shows), it must make that information public by filing a Form 8-K or by other methods that can effect broad and non-exclusionary distribution of that information. In 2004, the SEC made additional significant revisions to rules on 8-K filing. Effective August 23, 2004, Rule 33-8400 expands the number of events for which firms are required to file Form 8-K and reorganizes the reportable events into topical categories using a new numbering system with nine section headings (see Appendix B for details). Rule 33-8400 also mandates timelier 8-K filings and shortens the filing deadline. Under the new system, firms can either furnish a report under Item 7.01 or file a report under Item 8.01 to comply with Reg FD.

We do not expect all or even most selective disclosures to be characterized by 8-K filings designated as Item 7.01 or Item 8.01. The "mosaic" theory of information gathering along with the subjectivity in determining whether information is material allows management some latitude in determining whether filing a Reg FD-specific 8-K is warranted. We view all 8-K filings as significant informational events where private communication prior to the filings would be advantageous to some analysts and the public disclosure is likely to reduce or eliminate the selective disclosure advantage.

Compared to earlier research that shows lack of compliance in timely filing of 8-Ks (Schwartz and Soo 1995; Schwartz and Soo 1996; Carter and Soo 1999), Lerman and Livnat (2010) document an increase in timeliness of filings with 95% of firms in compliance with the accelerated filing deadline following Rule 33-8400. They also document that more than half of the 8-K filings in their sample period related to newly-mandated events and find a significant average market reaction for new 8-K disclosure categories. Lerman and Livnat (2010) interpret

the evidence as consistent with the new 8-K filing rules helping the general public gain timely access to value-relevant corporate news. However, their evidence also shows significant abnormal stock returns for many of the reported events both around the event dates and between the event and filing dates, similar to Carter and Soo's (1999) finding of significant market reactions as early as the event dates but limited responses at the 8-K filing dates. These results suggest that the market is reacting to corporate news before the 8-Ks are filed with the SEC. While abnormal returns alone do not indicate which market participants have early access to information disclosed on 8-Ks, we posit that as a key group of investment professionals and financial intermediaries, sell-side analysts are likely to benefit from selective disclosure. Surveys by Thomson Reuters and the Bank of New York Mellon indicate that a significant portion of the time that corporate management spends on interacting with the investment community is with sell-side analysts (Soltes 2014). Thus, we examine whether sell-side analysts have an information advantage prior to 8-K filings and whether 8-K filings reduce this advantage.[2]

2.2. Analysts' information advantage and social connection

Prior research finds mixed evidence on the impact of Reg FD on analysts. Heflin, Subramanyam and Zhang (2003) find no change in analysts' forecast accuracy or dispersion. In contrast, Agrawal, Chadha and Chen (2006) find a decrease in forecast accuracy and an increase in forecast dispersion, which they interpret as evidence of a decrease in selective disclosure and forecast quality. Other studies find evidence consistent with Reg FD resulting in increased effort by investment professionals who used to benefit from selective disclosure (Bailey, Li, Mao and Zhong 2003; Mohanram and Sunder 2006). Reg FD does not prohibit corporate management

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[2] Rubin, Segal, and Segal (2013) also examine analyst behavior around 8-K filings, but they focus on the tendency of analysts to revise their forecasts in response to 8-K filings and whether this tendency is associated with the skills of analysts. Our study differs from Rubin et al. (2013) in that we are interested in how 8-K filings affect the precision and quantity of idiosyncratic and common information components of analyst information environment.

from "disclosing a non-material piece of information to an analyst, even if, unbeknownst to the issuer, that piece helps the analyst complete a 'mosaic' of information that, taken together, is material." Thus, in the post-Reg FD disclosure environment, private interaction with corporate management could continue to serve as a source of analyst information advantage. Green et al. (2014) document that analysts benefit from private interactions at brokerage-hosted investor conferences. Analysts interviewed by Brown et al. (2015) explain that during private phone calls with management, they ask management questions that they don't want to share with other analysts, go over modeling questions, and gauge vocal cues from management, all of which help analysts get a better understanding of the company that they cover.

However, private interaction and information transfer are hard to observe and verify. Examining the internal records of a large publicly traded firm on private interactions between corporate management and sell-side analysts, Soltes (2014) finds that only 21% of the internally-documented private interactions for his sample firm can be located via public records. Thus we rely on social networks between corporate management and the investment community to infer the likelihood of private communication. Social networks connect corporate management with investment professionals through education, professional association, club membership, and past working relationships, presenting a powerful setting to examine the impact of private interactions outside of the official corporate disclosure channel.

Prior literature has shown that social connections are an important channel of information transfers and contribute to better performance of venture capital investment, mutual fund investment, and analyst recommendations among others (Hochberg, Ljungqvist, and Lu 2007; Cohen et al. 2008, 2010). Cohen et al. (2010) find that sell-side analysts outperform on their "buy" stock recommendations when they have an educational link to the covered firm's senior

officers and board members in the pre-Reg FD period, but not in the post-Reg FD period. Using a sample period that extends well into the post-Reg FD era, Christensen, Mikhail, Walther and Wellman (2014) find that analysts at politically connected brokerage houses have an information advantage – they issue more profitable upgrades than analysts at non-connected brokerage houses. Cai et al. (2014) find that investors are concerned with the transfer of privileged information via social networks. As a result, transaction costs are higher for firms with more social ties to the investment community. The findings in Christensen et al. (2014) and Cai et al. (2014) are consistent with a broader set of evidence that social connections facilitate the information transfer in the post-Reg FD era. Thus, social connections may continue to permit an information advantage through selective disclosure in the post-Reg FD era.

2.3. Testing the impact of Reg FD and 8-K filings

We identify firms more prone to selective disclosure as the ones with more social connections to the investment community. Reg FD and changes in 8-K filings apply to all firms regardless of their social connections. However, firms more prone to selective disclosure are affected more by the enactment of Reg FD.[3] We examine changes in the frequency and types of 8-Ks filed after Reg FD and after the 2004 regulations to provide some descriptive evidence that social connections are related to selective disclosure of material information. We expect that firms with more social connections file more 8-Ks, especially Reg FD disclosure related 8-Ks, in the post-Reg FD period. Thus we also expect a greater increase in the overall number of 8-Ks filed by highly-connected firms as they transition from pre-Reg FD to post-Reg FD environment.

We then test whether firms' selective disclosure practice in the post-Reg FD period enhances sell-side analysts' information advantage and examine whether 8-K filings help

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[3] Wang (2007) finds that the effect of Reg FD on firms' disclosure practices depends on whether firms are more likely to provide private earnings guidance prior to Reg FD.

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mitigate this advantage. Since the common practice of blackout periods before earnings announcements likely deters the flow of private information before earnings related 8-K filings, our primary focus is the role of non-earnings-announcement 8-K filings. Non-earnings-announcement 8-Ks are filed at irregular intervals since events triggering these filings occur at irregular intervals. Without private information, it is unlikely that analysts can predict most of these non-earnings-announcement events and change their forecasts prior to the events (Rubin, Segal and Segal 2013). Relying on the theoretical model in BKLS, we isolate analysts' private information from their total information (both common and private) to measure their information advantage. While it is possible that analysts' private information also reflects their individual research effort unrelated to selective disclosure, it is unlikely that we would observe a systematic association between firms' social connections and analysts' information advantage in the absence of any selective disclosure.

We assume that private information around 8-K filings manifests itself as the unique or idiosyncratic component of analyst forecast. We conjecture that if firms' social connections to the investment community facilitate selective disclosure prior to the filings, we would observe it in the proportion of private or idiosyncratic information used by sell-side analysts. As a result, the proportion of common information (*Commonality*) would be lower for high-connection firms prior to 8-K filings.

While the information flow through social connections affects the amount of private information obtained by analysts, it also affects the quality of the information they obtain, i.e., the precision of private information analysts use to form their forecasts. Bailey et al. (2003) conclude that in the post-Reg FD era, the quantity of information in the earnings announcements has not decreased but the difficulty for investors and analysts in interpreting the information has

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increased, resulting in greater disagreement and difference of opinions among investment professionals. In the case of non-earnings-announcement 8-K filings, even if the quantity of private information does not vary across high- and low-connection firms, when the information source is more closely connected to management's private information and when there are more channels of private communication, analysts are in a better position to complete the "mosaic" of information. As a result, we expect that for firms with high social connections, private communications before non-earnings-announcement 8-K filings lead to more precise idiosyncratic information than for firms with low social connections. Thus our first set of hypotheses in alternative form is as follows:

> *H1a. Prior to non-earnings-announcement 8-K filings, the proportion of common information relative to total information contained in analyst forecasts is lower for firms with more social connections to the investment community.*

> *H1b. Prior to non-earnings-announcement 8-K filings, the precision of idiosyncratic information contained in analyst forecasts is higher for firms with more social connections to the investment community.*

Ex ante, it is unclear whether 8-K filings will eliminate the differences in analyst information advantage between high and low connection firms. On the one hand, 8-K filings reduce the relative importance of selective disclosure by making previously idiosyncratic information common, reducing the difference in the amount of idiosyncratic information across high and low connection firms. If the public disclosure helps analysts covering low connection firms better interpret their private information, precision of their private information should increase more compared to analysts covering high connection firms whose information set already incorporates some of the content disclosed in the public filings.

On the other hand, 8-K filings could trigger additional private information search for all firms regardless of social connection. It is difficult to determine the difference across high and

low connection firms in the amount of private information gathered relative to the amount of common information released. Further, if high connection firms continue to communicate privately to the investment community under the "mosaic" exception even after the 8-Ks are filed, the filings would not necessarily level the playing field and completely erase the differential precision of idiosyncratic information. In that case, analysts covering high connection firms still have information advantage after 8-K filings. Thus our second set of hypotheses, stated in alternative form, assumes 8-Ks do not affect the association between social connections and analyst information advantage:[4]

> *H2a. After non-earnings-announcement 8-K filings, the proportion of common information relative to total information contained in analyst forecasts is lower for firms with more social connections to the investment community.*

> *H2b. After non-earnings-announcement 8-K filings, the precision of idiosyncratic information contained in analyst forecasts is higher for firms with more social connections to the investment community.*

3. Data and sample selection

The primary sources of our data include BoardEx database, Standard & Poor's (S&P) Filing Dates database, and the Institutional Brokers Estimate System (I/B/E/S). We describe the details of each data source below.

3.1. Data on 8-K filings

S&P Filling Dates database provides information from SEC EDGAR filings for all Compustat companies with market values above one million dollars. For each 8-K filing, we

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[4] BKLS (1998) also allows us to measure the precision of common information. We do not expect that the precision of common information will be different for high-connection versus low-connection firms either prior to or after 8-K filings unless social connections proxy for other firm attributes that are associated with better public disclosure. We present results on the precision of common information for comparison with the precision of private information.

identify the fiscal year of the filing date and map the reportable events into the new numbering system that became effective August 23, 2004 (see Appendix B for details).

Our sample of 8-Ks spans the period from 1993 to 2012. Figure 1 provides a broad picture of how 8-K filings have changed over this period. The left vertical axis is for the average number of days between the event date and the 8-K filing date and the right vertical axis is for the average number of 8-Ks filed per firm per year. Not surprisingly, firms file 8-Ks sooner after 2004 when the SEC shortened the filing deadline for most items. More importantly, there is a significant jump in the average number of 8-Ks filed between 2000 and 2005 – from below four filings for a typical firm in 2000 to almost 12 filings in 2005. The average number of 8-Ks stays in the range of 10-12 filings a year after 2005. The expansion in the number of reportable events alone cannot explain this trend since the new 8-K rules become effective August 2004 but the jump occurs prior to 2004. This trend is broadly consistent with firms filing more Form 8-Ks to comply with the requirements of Reg FD. The increase in 8-K filings is also consistent with the survey evidence in Brown et al. (2015) that firms "paper things up [with an 8-K]" after Reg FD. To verify whether the number of 8-Ks filed and the increase in 8-Ks is greater for firms with more social connections, we merge our sample of 8-Ks with social connection data from BoardEx and analyst forecast information from I/B/E/S.

3.2.Data on analyst information environment

Relying on the theoretical model in BKLS, we use observable attributes of analysts' forecasts to derive empirical measures of unobservable dimensions of information that goes into the generation of analysts' forecasts. BKLS model uses analyst forecast dispersion and error to analyze analysts' information sources, which consist of common information and idiosyncratic information. Common information is the information available to all analysts and usually arises

from public information such as firms' public disclosure and macroeconomic information. Idiosyncratic (private) information is the information specific to an individual analyst, developed by analysts through their individual efforts.

Following the empirical implementation of BKLS in Barron et al. (2002) and Barron et al. (2008), we obtain individual analyst forecasts of annual earnings for the fiscal year of the non-earnings-announcement 8-K filings from I/B/E/S Detail History file. We include all non-earnings-announcement 8-K filings instead of restricting our analyses to Reg FD-specific 8-Ks because the "mosaic theory" implies that private communications of non-material information can still help some analysts piece together material information prior to the public disclosure of significant corporate events on 8-Ks. To ensure that the comparison between the analysts' information environment before and after the filing is based on the same set of individual analysts, an individual analyst must issue an earnings forecast for a firm 45 days prior to a given 8-K filing (days -45 through -1, where day 0 is the 8-K filing date) and then update that forecast within 30 days after the filing (day 0 through +29) to be included in our sample.[5] The 45-day window also allows reasonable amount of time for private communications to occur via social connections. Information flow around 8-K filings that is unrelated to selective disclosure will likely add noise to our tests and should work against finding a difference in analyst information advantage around the 8-K disclosure.

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[5] Barron et al. (2002) argue that the assumption of equal precision of private information in BKLS is reasonable in this sample since it includes only analysts who are actively following the firms they cover, thus there are likely to be smaller differences in precision of private information among these analysts. In our setting we are interested in cross-firm differences in the precision of analysts' information. The assumption of equal precision of private information is not violated in our setting if analysts of high-connection firms have similarly precise information relative to each other. We do not assume differential levels of precision and thus selective disclosure across analysts within firms.

We follow Barron et al. (2002) and measure the proportion of common information relative to total information (*Commonality*), the precision of common information (*Common*), and the precision of idiosyncratic information (*Idiosync*), as follows:

$$Commonality = \frac{Common\ Forecast\ Error}{Average\ Total\ Error} = \frac{SE - \frac{D}{N}}{\left(SE - \frac{D}{N}\right) + D} \qquad (1)$$

$$Common = Commonality \times \frac{1}{Average\ Total\ Error} = \frac{\left(SE - \frac{D}{N}\right)}{\left[\left(SE - \frac{D}{N}\right) + D\right]^2} \qquad (2)$$

$$Idiosync = (1 - Commonality) \times \frac{1}{Average\ Total\ Error} = \frac{D}{\left[\left(SE - \frac{D}{N}\right) + D\right]^2} \qquad (3)$$

where *SE* is the squared error in the mean forecast, scaled by absolute value of actual EPS; *D* is the variance (or dispersion) among the forecasts, scaled by absolute value of actual EPS; and *N* is the number of forecasts. We construct *Commonality*, *Common* and *Idiosync* for the pre-filing and post-filing periods separately and denote them with subscript $_{pre}$ and $_{post}$. Consistent with prior papers using the BKLS model empirically, we set negative value of *Common* to zero.

3.3.Data on social connections with the investment community

Using BoardEx data, we measure a non-investment firm's social connections to the investment community (*Connection*) as the number of unique investment firms that the non-investment firm's CEO, CFO, or board members have connections with either through education or employment (see Appendix C for details). We focus on the CEOs, CFOs and board of directors because they are likely to possess information about firms' material events sooner than other officers. When constructing *Connection*, we ignore whether the connection is through CEO, CFO, or directors, and whether the connection is through education or work experience. For example, for a given firm in a given year, its CEO has both educational and work connection to

the investment firm Morgan Stanley; its CFO has work connection to Morgan Stanley; one of its directors has educational connection to investment firm Lehman Brothers. In this case, *Connection* equals to two since this company has connections with two investment firms: Morgan Stanley and Lehman Brothers.

After obtaining the social connection data for all non-investment firms, we merge them with 8-K filings data from the S&P Filing Dates database and data on analyst information environment obtained from the I/B/E/S detail history file. Our sample period is the post-Reg FD period from 2001 to 2012.[6] In addition, we collapse 8-K filings on the same date into one filing date observation and remove dates with Item 2.02 (Results of Operations and Financial Condition) or dates within 10 days of a periodic report (i.e., 10-K or 10-Q filing). Our initial sample contains 3,326 non-investment firms, 14,176 firm-years, and 48,062 unique non-earnings-announcement 8-K filing dates.

Table 1 presents summary statistics for our social connection data. Results show that an average firm in our sample has one CEO, one CFO and between seven and eight directors. On average, a non-investment firm is socially connected with 72 investment firms in a given year, 20 if we only look at education connections and 59 if we only look at employment connections. When we focus on social connections through different positions held by individuals from the non-investment firm, we can see that an average non-investment firm has social connections with 63 investment firms through directors, 6 through CEO, and 10 through CFO. A CFO is likely to have more social connections with the investment community than a CEO probably because a CFO tends to have more finance/accounting education background and professional experience. Finally, because BoardEx's coverage increases over time, a non-investment firm's *Connection*

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[6] Our sample period starts in year 2001 because BoardEx database collects annual information beginning in year 2000 and Reg FD was also introduced in the same year.

can increase over time simply because more investment firms (and their employees) are included

in the database.[7] Therefore, we standardize *Connection* every year to have mean zero and

standard deviation of one (denoted *Z_Connection*).

4. Empirical results

In this section, we conduct empirical analyses to test our hypotheses. We start with a

comparison of 8-K filings between firms with high connection to the investment community and

firms with low connection. We then conduct univariate and multivariate tests on whether analyst

information advantage prior to 8-K filings differs for high versus low connection firms and

whether 8-K filings reduce this advantage.

4.1. Number of 8-K filings

Table 2 compares 8-K filings for firms with high, medium and low degrees of social

connection. We examine all 8-K filings for our 14,176 firm-year observations, including Item

2.02 and 8-Ks filed within 10 days of a periodic report. Since the pre-Reg FD period also

predates the starting year of the BoardEx data, to analyze changes in firms' 8-K filing behavior

from pre-Reg FD to post-Reg FD periods, we rely on the average *Z_Connection* in the post-Reg

FD period to infer whether a firm is also highly connected to the investment community prior to

2000. We classify firms as having low, medium or high levels of connection based on the tercile

rankings of their average *Z_Connection* in the post-Reg FD period.[8] The average low connection

firm has 29 connections, compared to 60 for a medium connection firm and 106 for a high

connection firm.

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[7] Untabulated results confirm that an average non-investment firm's connection to the investment community
increases systematically over the sample period.
[8] Pearson correlation between a firm's *Connection* in the current year and the previous year is 91.32% during 2000-
2012 (untabulated). Therefore, we conjecture that a firm with high average connection during the 2000-2012 period
is likely to be highly connected to the investment community before year 2000 as well.

Panel A compares the 8-K filing behavior across high, medium and low connection firms over three separate filing periods – pre-Reg FD period that includes fiscal years prior to 2000, early post-Reg FD period that includes fiscal years 2001-2003, and late post-Reg FD period that includes fiscal years 2005-2012. We exclude fiscal year 2000 and 2004 as 2000 is the transition year for Reg FD and 2004 is the transition year 8-K filing regulations changed.

Panel A shows that within each filing period high connection firms file a higher number of 8-Ks per year compared to low connection firms. For example, prior to 2000 (pre-Reg FD period), high connection firms file on average 3.796 Form 8-Ks per year (*Num_8K*), significantly higher than the average of 2.506 for low connection firms. This number more than doubles to 9.885 (7.233) for high (low) connection firms in the early post-Reg FD period of 2001-2003, and then almost doubles again between 2005 and 2012 under the new 8-K rules. We also calculate the change in the average number of filings from one period to the next for a subset of firms with data in two consecutive periods (*ΔNum_8K*). Results show that the average increase in the total number of filings from pre-Reg FD to 2001-2003 is 4.297 for high connection firms, significantly higher than the average increase of 3.064 for low connection firms. In contrast, the average increases from 2001-2003 to 2005-2012 are not significantly different across high and low connection firms. These results suggest that firms more prone to selective disclosure are affected more by the enactment of Reg FD and accordingly changes in 8-Ks filing rules, and this effect is most evident when all firms transition from the pre-Reg FD to post-Reg FD disclosure environment.

Panel B shows the number of 8-Ks filed under Item 7.01 (Regulation FD Disclosure) and Item 8.01 (Other Events) in the post-Reg FD periods - indicated by variables *Num_701* and *Num_801*. We select Item 7.01 and Item 8.01 because disclosures governed by Reg FD could be

filed or furnished under these categories.[9] Results show that during the early post-Reg FD period of 2001-2003, high connection firms file a higher number of 8-Ks with Item 7.01 or Item 8.01 compared to low connection firms. The number of 8-Ks with Item 7.01 and Item 8.01 in 2001-2003 corresponds with the change in the total number of 8-Ks from the pre-Reg FD period to 2001-2003. For example, the median number of total 8-Ks for low connection firms changes from two in the pre-Reg FD period to six in years 2001-2003 (see Panel A), an increase of four filings that matches the median number of 8-Ks with Item 7.01 (one filing) and Item 8.01 (three filings) in 2001-2003. In the late post-Reg FD period of 2005-2012, the number of 8-Ks with Item 8.01 are still significantly higher for high connection firms than for low connection firms. When we conduct these univariate tests using annual tercile rankings of *Z_Connection*, we find similar patterns (untabulated). These results are generally consistent with high connection firms making more selective disclosures of material information to the investment community than low connection firms in the post-Reg FD period.

4.2. Analyst information advantage

One challenge we face in estimating the effect of social connections on analyst information advantage is that firms' social connections are highly correlated with firm size (Pearson correlation between firm sales and *Z_Connection* is 48%). Thus, to test how 8-K filings affect analyst information advantage, we use a matched-sample research design to rule out the possibility that firm size alone drives the information advantage for analysts.

4.2.1. Matched sample construction

To construct the matched sample, we start with firm-years from the annually-ranked low and high *Z_Connection* terciles. We focus on low and high connection firms to allow for sharper

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[9] Untabulated results show that close to 80% of 8-Ks filed under Item 7.01 also include Item 9.01 "Financial Statements and Exhibits", which often contains press releases or presentation to select investor groups at events such as investor conferences or road shows.

contrast and use annual tercile rankings to facilitate the best matching in any given year. We match (with replacement) each firm-year in the low tercile, to the firm-year from the high tercile with the closest firm size (natural logarithm of sales). For each pair, we calculate the absolute percentage difference in firm size and remove the pairs at and above the 99th percentile of this difference to allow for better matching between high and low connection firms.[10] We retain 4,683 pairs of firm-years. Since we allow high connection firm-years to be matched with more than one low connection firm-years, our matched sample include 4,683 unique firm-years from low *Connection* tercile and 1,603 unique firm-years from high *Connection* tercile.[11] Our final sample includes 26,403 unique, non-earnings-announcement 8-K filing dates pooled across high and low connection firms with non-missing values for all variables used in the regression.

Table 3 Panel A compares our matched low and high connection firms. The average low connection firm reports $448 million annual sales (average *Size* or natural logarithm of sales is $6.103 million). The average high connection firm reports $446 million annual sales (average *Size* or natural logarithm of sales is $6.099 million), not significantly different from average sales of low connection firms. This suggests that our matching procedure is successful in finding high connections firms that are similar in size to low connection firms.

Table 3 Panel B presents descriptive statistics for measures related to analyst information. Overall, the properties of these measures are consistent with prior studies such as Barron et al. (2002) and Mohanram and Sunder (2006) that implement the BKLS model empirically. The mean (median) level of *Commonality* starts out at 69.25% (88.11%) before the 8-K filings, and

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[10] The 99th percentile of the absolute percentage difference in firm size is 52.85%, which means that the firm size of the high connection firm is 52.85% larger than the low connection firm for the matched pair at 99th percentile.
[11] When we pool all low and high connection firm-years and use the group as a whole in the regression analysis, we assign high connection firm-years a frequency weight that reflects the number of times they are selected as a match (Stuart 2010), so high connection firm-year observations are used multiple times in the regression if they are selected as a match multiple times.

then drops significantly to 66.42% (84.78%) after the 8-K filings. The decline in *Commonality* is also observed by Barron et al. (2002) around earnings announcements. The reason provided by Barron et al. (2002) for this decline is that earnings announcements trigger significant private information discovery, which exceeds the amount of common information released by the announcements. This explanation is likely to account for the decline in *Commonality* around 8-K filings as well.

The precision of both private and common information (*Idiosync* and *Common*) increases while the variance (*D*) and squared error (*SE*) in the mean forecast decrease from the pre-filing to the post-filing period, suggesting that public disclosure of material events improves the information quality in analyst forecasts. Note that both information precision measures (*Idiosync* and *Common*) are highly skewed – their means are much greater than medians, therefore we use natural logarithm of *Idiosync* (*lnIdiosync*) and *Common* (*lnCommon*) for the rest of our analyses.[12] The means and medians for *lnIdiosync* and *lnCommon* are comparable and both variables still increases significantly from pre-filing period to post-filing period.

4.2.2. Univariate Analysis

Table 4 presents univariate comparisons of the commonality and precision of information in analysts' forecasts around 8-K filings for firms with high and low connections to the investment community to test Hypotheses 1 and 2. In the pre-filing period, mean (median) *Commonality* is 71.13% (88.87%) for low connection firms and 67.54% (86.57%) for high connection firms. These differences between high and low connection firms are both significant at the 1% level. Since the proportion of private information rises as *Commonality* decreases, this result suggests that for high connection firms, a higher percentage of analyst information comes

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[12] More specifically, we add one to *Idiosync* and *Common* respectively and then take natural logarithm. Adding one to the information measures allow us to keep observations with value zero.

from private sources compared to low connection firms. *Commonality* in the post-filing period remains higher for low connection firms than for high connection firm, indicating that 8-K filings do not reverse this pattern. Untabulated results also show that the reduction in *Commonality* around 8-K filings (i.e., increase in the proportion of private information) is significantly more for firms with fewer connections. This suggests that the public disclosure of material event triggers more private information discovery relative to common information provided by the filings for low connection firms.

Results also show that in the pre-filing period, the mean (median) precision of idiosyncratic information (*lnIdiosync*) is 1.952 (1.052) for low connection firms, which is significantly lower than 2.166 (1.321) for high connection firms. This difference is again evident in the post-filing period - the mean (median) *lnIdiosync* is 2.367 (1.566) for low connection firms, significantly lower than the average of 2.484 (1.769) for high connection firms. Untabulated results show that high connection firms see an average increase of 0.327 in the precision of private information from the pre- to the post-filing period, significantly lower than the average increase of 0.417 for low connection firms.[13] The univariate results are consistent with analysts covering high connection firms benefiting from having access to either more accurate private information or more channels of private communications both before and after 8-K filings. However, filings of 8-Ks benefit analysts covering low connection firms more as public disclosure on 8-Ks help them better interpret their less precise private information, thus significantly improving the quality of their private information.

In comparison, the univariate tests for the mean (median) precision of common information (*lnCommon*) show that the difference between low connection and high connection firms is only significant in the post-filing period but not in the pre-filing period. Untabulated

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[13] The *t*-statistic for the difference is -3.87 with p-value<0.0001.

results show that the increase in the combined precision of private and common information is greater for analysts covering low connection firms than for those covering high connection firms.

To summarize, Table 4 shows that without controlling for firm characteristics, univariate evidence is consistent with analysts having an information advantage when they cover firms with more social connections to the investment community. Their information source consists of a higher percentage of private information in general and the precision of their private information is higher before the 8-Ks are filed. 8-K filings result in improvements in the precision of both private and common information for all firms regardless of social connections; however, analysts covering low connection firms benefit more from public disclosure as they see more improvement in the precision of their private information.

4.2.3. Multivariate regression analyses

To further test our hypotheses on the association between firms' connection with the investment community and analyst information advantage, we estimate the following equation for the pre-filing and post-filing periods separately and then test the difference in the coefficients for *Z_Connection* between the pre- and post-filing periods:

$$Y_{i,t} = \beta_0 + \beta_1 \times Z\_Connection_{i,t} + \sum_{k=2}^{K} \beta_k \times Control_{i,t} + \varepsilon_{i,t}, \tag{4}$$

Y is one of the following variables – *Commonality, lnIdiosync,* and *lnCommon* – in the pre-filing (labeled with subscript pre) or post-filing period (labeled with subscript post). *Commonality, lnIdiosync,* and *lnCommon* are as previously defined. *Z_Connection* is *Connection* standardized every year to have mean zero and standard deviation of one. We present our results for the pre- and post-filing periods separately because the relation between the control variables differs for these periods, requiring a fully-interacted model. In addition, we cluster the standard errors at the firm level and include both year and industry fixed effects in the regression.

We collect financial data from Compustat, stock return data from CRSP, and GDP data from the Federal Reserve to construct our control variables. We follow prior literature and include control variables that are potentially associated with a firm's information environment and the effect of 8-K filings. Firm size (natural logarithm of total sales, *Size*), performance (return on assets, *ROA*), growth opportunities (market-to-book ratio, *MTB*), and analyst following (*Analyst*) are important proxies for a company's information environment. Firms that are larger, perform better, grow more slowly, and are covered by more analysts are less opaque and have less information uncertainty in general (Hong, Lim, and Stein 2000; Zhang 2006). We control for leverage (*Leverage*) and loss (*Loss*) since leverage adds to the volatility of earnings and loss firms are harder to value. We control for the information content of 8-K filings using the absolute magnitude of the three-day cumulative abnormal return (*absCAR*) around the 8-K filing. We include gross domestic product change ratio (*GDPR*) to control for macroeconomic effects. We also control for how close the 8-K filing event is to the earnings announcement date for the fiscal year (*Horizon*). 8-Ks filed earlier in the year are likely to introduce more uncertainty than the ones filed later in the year when it is closer to the announcement of annual earnings. *Horizon* of 8-Ks also approximates the horizon of analyst forecasts.

Table 5 provides descriptive statistics and correlation coefficients (Pearson and Spearman correlations are above and below the diagonal, respectively) for regression variables in our matched sample. Panel A shows that the average firm in the sample has annual sales of $581.66 million (average *Size* or natural logarithm of sales is $6.366 million), return on assets of 1.3%, market-to-book ratio of 3.487, debit-to-asset ratio of 0.518, and it is covered by about seventeen analysts. About 29.2% of our observations report losses. Panel B shows that the social connection measure *Z_Connection* still has a significant and positive correlation with firm size

(0.056 for Pearson and 0.058 for Spearman correlation), but the magnitude of correlation is much smaller than for the full sample. The other relatively high correlations are the positive correlation between firm size and analyst following (0.402 and 0.420 for Pearson and Spearman correlation respectively) and between performance (*ROA*) and loss (-0.696 and -0.788 for Pearson and Spearman correlation respectively), both of which are expected.[14]

Table 6 presents the results on the association between social connections and the proportion of common information (*Commonality*), testing Hypotheses 1a and 2a. For the pre-filing period in Column (1), higher social connections reduce the relative amount of common information in analysts' forecasts (*Z_Connection* = -1.579, *t* = -2.330), consistent with Hypothesis 1a. For the post-filing period in Column (2), *Z_Connection* is not significantly related to *Commonality* (*Z_Connection* = -0.052, *t* = -0.080), consistent with 8-K filings reducing connection-related differences in the proportion of common information contained in analyst forecasts. A Wald chi-square test shows that the coefficients on *Z_Connection* in Columns (1) and (2) are significantly different from each other (χ^2-stat is 9.67 and significant at 1% level), indicating a company's connection with the investment community has a stronger effect on *Commonality* in the pre-filing period than in the post-filing period. Analysts who cover high connection firms have access to greater amount of idiosyncratic information prior to 8-K filings and 8-K filings reduce this information advantage by making previously idiosyncratic information common.

Among the control variables, in the pre-filing period, *Size*, *ROA*, *Loss*, *absCAR*, *GDPR* and *Horizon* are positively associated with *Commonality* while *Analyst* is negatively associated with *Commonality*. These results suggest that the proportion of common information is higher for larger firms, firms with more extreme earnings, firms with high returns around 8-K filings,

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[14] We have tested for multicollinearity and no variance inflation factors (VIF) are greater than 10.

and firms with lower analyst coverage. *Commonality* is also higher when 8-Ks are filed earlier in the year and when the overall economic condition is better, perhaps because analysts invest more effort in collecting private information later in the year and when it is more difficult to assess firms in an economic downturn. Results on the control variables in the post-filing period are largely consistent with those in the pre-filing period except that coefficients on *absCAR* and *GDPR* are no longer significant and the coefficient on *MTB* is significantly negative, suggesting that higher growth firms have lower *Commonality* post-filing.

Table 7 presents the results on the association between social connections and the precision of idiosyncratic information, testing Hypotheses 1b and 2b. For the pre-filing period in Column (1), a company's social connections with the investment community increase the precision of private information contained in analyst forecasts (*Z_Connection* = 0.101, *t* = 2.290). This is consistent with Hypotheses 1b that high connection firms making more selective disclosures of material or immaterial information that allows analysts to complete the "mosaic". For the post-filing period in Column (2), the coefficient on *Z_Connection* is insignificantly different from zero (*Z_Connection* = 0.040, *t* = 0.880), thus we are unable to reject the null-hypothesis of no-difference between high and low connection firms. This suggests that a company's social connections with the investment community are not associated with the precision of private information contained in analyst forecasts after 8-K filings. The Wald chi-square test shows that the coefficients on *Z_Connection* in Columns (1) and (2) are significantly different from each other (χ^2-stat is 4.97 and significant at 5% level). This evidence is consistent with 8-K filings attenuate the information advantage that analysts are able to obtain when they cover firms with more social connections to the investment community.

Among the control variables, *Analyst* is positively associated with the precision of private information while *ROA*, *Leverage*, *Loss*, *absCAR* and *Horizon* are negatively associated with the precision of private information in the pre-filing period. These results suggest that the precision of private information is higher for firms with more analyst coverage perhaps because analysts invest more effort in searching for information edge when there is more competition among them. The precision of private information is lower for highly leveraged firms and firms with poorer performance perhaps because it is harder to value earnings of firms with high leverage and poor performance. Lastly, the precision of private information is lower when the material event has a bigger stock return impact and when the event is filed earlier in the year. This suggests that events with bigger impact and happen earlier in the year introduce more information uncertainty and hence decrease the precision of information possessed by analysts. Results in the post-filing period are largely consistent with those in the pre-filing period except that the coefficient on *MTB* is positive and significant.

Table 8 presents the results on the link between social connections and the precision of common information. We find no statistically significant association between social connections and the precision of common information during both pre- and post-filing periods, which suggests that the number of social connections to the investment community does not simply proxy for other firm attributes that indicate better public disclosure. However, a Wald test shows that the coefficients on *Z_Connection* in the pre- and post-filing periods are significantly different. The significant change in the coefficient on *Z_Connection* from negative in the pre-filing period to positive in the post-filing period (albeit insignificantly different from zero in both periods) implies that 8-K filings improve the precision of common information less for firms with lower levels of social connection. Results on the control variables in the pre-filing period

show that high growth firms, firms covered by more analysts, less leveraged firms, and profitable firms have higher precision of common information prior to 8-K filings. The precision of common information is also higher when the overall economic condition is better. Results in the post-filing period are similar to those in the pre-filing period except that the coefficient on *SIZE* is positive and significant, and the coefficient on *Analyst* is insignificant.

To summarize, we provide evidence consistent with our conjecture that analysts covering firms with more social connections to the investment community have information advantage prior to 8-K filings. Filings of 8-Ks tend to attenuate the association between social connections and analysts' information advantage.

5. Additional Analyses

5.1. 8-K filings under different items and during different periods

We include all non-earnings-announcement 8-Ks in our main tests because firms do not have to file 8-Ks under Item 7.01 or Item 8.01 when disclosing non-material information which analysts could use to piece together material information. In additional analyses, we rerun our regressions in Tables 6-8 for a subsample of 8-Ks filed under either Item 7.01 or Item 8.01 and a subsample of remaining non-Reg-FD-specific 8-Ks where the "mosaic" exception is more likely to be applied. We tabulate results on *Commonality* and *lnIdiosync* for the subsample analyses in Table 9.[15]

Table 9 Panel A reports results for the subsample of Reg FD-specific 8-Ks. These results are similar to those in Tables 6-7, i.e., social connections are significantly associated with the proportion of common information and the precision of idiosyncratic information during pre-

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[15] Similar to results in Table 8, we do not find significant association between *Z_Connection* and *lnCommon* in subsample analyses either pre- or post-filing.

filing period but not during post-filing period. This suggests that for highly visible events such as broker-hosted investor conferences that require Reg-FD 8-K filings, public disclosure eliminates the analyst advantage arising from selective disclosure, which is consistent with the regulatory intent. For non-Reg FD-specific 8-Ks (Panel B), both the precision and the proportion of private information are higher for high connection firms compared to low connection firms before 8-Ks are filed, consistent with selective disclosure of immaterial information that permits analysts to complete the "mosaic." In contrast to Reg FD specific 8-Ks, the precision of private information is still higher for high connection firms compared to low connection firms even after non-Reg FD-specific 8-Ks are filed. Thus for the majority of other important corporate events, public disclosures on 8-Ks do not eliminate analyst information advantage. This is likely a result of the "mosaic" exception playing a more important role in information transfer around these events which does not completely stop once 8-Ks are filed.

In addition, since the new 8-K filing rules take effect in 2004, we also test whether there is a significant shift before and after 2004 in the relation between social connections and analyst information advantage. Untabulated results find no evidence of such a shift.

5.2. *Alternative social connection measures*

Our findings are also robust to using two alternative measures of firms' social connections with the investment community. Our first alternative measure counts the number of connections to the investment community rather than the number of unique investment firms. Specifically, every time when a member of the non-investment firm's top management team shares any education tie with an individual from an investment firm we count it as one connection. Because sociology studies (e.g., Fischer 1982) show that the tendency of individuals to associate and bond with similar others becomes stronger as more types of relationships exist

between two people, we repeat the process for employment ties and add up the education and employment connections. The sum of all connections across the non-investment firm's CEO, CFO and board members is our first alternative measure.

Our second alternative measure is similar to the one used in Cai et al. (2014). We count the number of a non-investment firm's CEO, CFO and board members that have connections to any individual from an investment firm through either education or employment. As more people in the non-investment firm have social connections with the investment community, private interaction and information transfer are more likely to occur. When we replace *Z_Connection* with these alternative measures in the multivariate regression analyses, results (untabulated) are similar to those in Tables 6-8.

5.3. Selective disclosure and bid-ask spreads

Cai et al. (2014) find that firms' social connections with the investment community are associated with wider bid-ask spreads because the market is concerned with the transfer of privileged information via social networks. To provide some preliminary evidence on whether markets anticipate or understand the implications of 8-K filings for reducing the information advantage of analysts covering highly connected firms, we examine differences in bid-ask spreads before and after 8-K filings. Conceptually, bid-ask spreads reflect the market's *perception* about the risk of informed trading. Although prior research that examines bid-ask spreads around earnings announcements typically finds that earnings releases increase information asymmetry (Krinsky and Lee 1996; Lee, Mucklow and Ready 1993;Venkatesh and Chiang 1986), it is less clear how bid-ask spreads will change around unscheduled events. Conrad and Niden (1992) find little evidence of increased spreads prior to corporate acquisition announcements. Instead, they observe declines in the spreads on the day before and the day of

the announcements. In contrast, Singh, Zaman and Krishnamurti (1994) find that spreads increase prior to announcements of open market stock repurchases and but not subsequently. Given the diverse nature of corporate events reported on 8-Ks, it is unclear ex ante how the market's perceived risk of informed trading changes around these filings. Thus this additional analysis is largely exploratory.

To facilitate comparison to Cai et al. (2014), our sample for these tests includes all non-investment firms' 8-K filings with BoardEx data on *Z_Connection*, and sufficient CRSP and Compustat data to compute natural log of bid-ask spread (*BidAsk*) for a ten-day window around the 8-K filing date (day -5 to -1 and day 0 to 4), as well as trading volume, stock price, market capitalization, number of trades per day, listing on the Nasdaq exchange, and return volatility. This sample is comprised of 46,889 unique non-earnings 8-K filing dates.[16] We first replicate Cai et al. (2014) in Table 10 Columns (1) and (2). Consistent with their results, we find a positive and significant relation between *Z_Connection* and the *BidAsk* in both the pre- and post-8-K filing periods.

Since our primary interest is the effect of 8-K filings, in Columns (3) and (4) of Table 10, we include *absCAR* and *Horizon* associated with 8-K filings to control for the new information contained in the filings and differences in the timing of the filings. We interact *Z_Connection* with *absCAR* to test whether the effect of *absCAR* on bid-ask spreads varies across high and low connection firms.[17] Analysis results show that the coefficients on *absCAR* are positive and significant in both the pre- and post-filing periods, evidence that 8-K filings with larger market

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[16] We also require data available to calculate *absCAR* and *Horizon*. Our sample for the bid-ask spread tests includes 3,308 unique firms and 13,966 unique firm-years.

[17] Pearson correlation between *Z_Connection* and *absCAR* is modest to cause concerns for multicollearity (-0.098 in this sample). Nevertheless, we test for multicollinearity and variance inflation factors (VIF) are generally less than 10 except for the Nasdaq listing indicator variable and the interaction of this indicator variable with average daily trades.

reactions are associated with wider bid-ask spreads. These results are consistent with Lee et al.

(1993) who find a wider bid-ask spread leading up to and after earnings announcements for firms

with higher announcement-period returns. Furthermore, the impact of *absCAR* on bid-ask

spreads increases significantly from the pre- to the post-filing period ($\chi^2 = 27.54$ and significant at

1% level), suggesting that the perceived risk of informed trading for a high-impact 8-K increases

following the filing. This result is not surprising given the evidence in Table 3 and Table 6 that

analysts' efforts increase the percentage of idiosyncratic information in the market for all firms

following 8-K filings. It is also consistent with increases in bid-ask spreads around earnings

announcements documented in prior research.

The main effect of *Z_Connection* becomes insignificant in both pre- and post-filing

periods. However, the coefficients for the interaction of *Z_Connection* with *absCAR* are

significantly positive in both periods and the increase from the pre- to the post-filing period is

significantly different from zero ($\chi^2 = 5.67$ and significant at 5% level). These results suggest

that the market is more concerned about risk from informed trading around high-impact 8-K

filings for highly-connected firms, and this concern becomes more acute immediately after 8-K

filings. Since our subsample analysis shows that as a result of the "mosaic" exception, 8-K

filings do not completely erase analyst information advantage arising from selective disclosure,

the market's concern about informed trading after public disclosures on 8-Ks is perhaps

justifiable.[18]

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[18] We also redo the analysis using our matched sample. When we match on firm size, we find no significant main-effect for *Z_Connection* in the pre- or post-filing period. However, the coefficient on *absCAR* is positive and significant in the 5-day window after the 8-K filing but not before. The interaction of *Z_Connection* with *absCAR* is not significantly different from zero either in the pre-or the post-filing period. Thus, when we control more carefully for differences in firm size, market concerns about informed trading arising from social connections are secondary to the information reported in the 8-K.

6. Conclusion

In this study, we investigate whether firms' selective disclosure to the investment community still provides information advantage to sell-side analysts in the post-Reg FD era and test whether public disclosure on Form 8-Ks mitigates this advantage. We first provide evidence that firms with more social connections to the investment community are more likely to engage in selective disclosure of material information as they file more Reg FD related 8-Ks.

We next examine analyst information advantage arising from covering high connection firms around filings of non-earnings-announcement 8-Ks and test whether 8-K filing requirements mitigate this information advantage. Following Barron, Kim, Lim and Stevens (1998), we differentiate between common (public) and idiosyncratic (private) components of analysts' information environment. We posit that private interactions that occur through social networks are most relevant for the idiosyncratic information discovery. The univariate tests show that when analysts cover firms with more social connections to the investment community, a higher percentage of their information comes from private sources both before and after 8-Ks are filed. Filing of 8-Ks results in improvements in the precision of both private and common information regardless of social connections. However, analysts covering low connection firms benefit more from 8-K filings as they see more improvement in the average precision of their private information.

Multivariate regression analyses using matched sample research design show that both the proportion and the precision of idiosyncratic information are higher prior to 8-K filings but not after. In comparison, the precision of common information is not statistically associated with social connections either prior to or after the 8-K filings. These results are consistent with the conjecture that private communications through social connections occur before the public disclosure on 8-Ks and sell-side analysts who cover high connection firms benefit from these

communications. Filing of 8-Ks appears to level the playing field. Additional subsample analyses reveal that the effect of 8-Ks on leveling the information playing field is primarily driven by 8-Ks filed to comply with Reg FD. Exploratory tests on the differences in bid-ask spread suggest that market participants remain concerned about selective disclosure after 8-K filings.

We offer some avenues for future research. First, I/B/E/S (our source of analyst data) no longer provides the Broker and Analyst Translation files that will allow us to translate broker and analyst codes to actual names. Future research could obtain identities of analysts from research reports and construct social networks of individual analysts using hand-collected data from websites such as LinkedIn to examine the evolution in how individual analysts' personal networks affect their ability to gather information in the post-Reg FD era. Second, a sophisticated mapping of the topology of social networks between firms and the investment community will allow researchers to delve more into the nature of each network and how characteristics of networks such as centrality affect selective disclosure.

Appendix A. Variable Definitions

Variable	Definition
absCAR	Absolute value of cumulative abnormal (adjusted with the value-weighted market index) return over the three-day window around the event date, where the event is non-earnings Form 8-K filing.
Analyst	Number of analysts following the firm.
Avg_DaysToFile	The average number of days between 8-K filing date and the event date for a given firm in a given year.
BidAsk	Natural logarithm of a stock's average proportional quoted bid-ask spread as (ask price-bid price)/average quoted price, measured during five days before or after 8-K filing dates.
Common	Precision of common information contained in analyst forecasts following Barron, Kim, Lim and Stevens (1998), measured during 45 days before or 30 days after a non-earnings 8-K filing.
Commonality	Proportion of common information to the total information contained in analyst forecasts measured following Barron, Kim, Lim and Stevens (1998), measured during 45 days before or 30 days after a non-earnings 8-K filing.
Connection	Total number of investment firms with which a non-investment firm has social connections.
D	The variance (or dispersion) among the analyst forecasts scaled by absolute value of actual EPS, measured during 45 days before or 30 days after a non-earnings 8-K filing.
GDPR	Quarterly change in the seasonal growth rate in gross domestic product (GDP). Obtained from Federal Reserve website: http://research.stlouisfed.org/fred2/series/GDP/downloaddata?cid=106
Horizon	The number of days between the 8-K filing date and annual earnings announcement date.
Idiosync	Precision of idiosyncratic information contained in analyst forecasts measured following Barron, Kim, Lim and Stevens (1998), measured during 45 days before or 30 days after a non-earnings 8-K filing.
Leverage	Total liabilities scaled by total assets at the beginning of the fiscal year.
Loss	An indicator variable which equals one if the firm incurs a loss during the year, and zero otherwise.
MarketCap	Natural logarithm of the product of average number of shares outstanding and the average share price during five days before or after 8-K filing dates.
MTB	Ratio of market value of common equity to book value at the beginning of the fiscal year.

NASDAQ	An indicator variable which equals one if the stock is listed on Nasdaq, and zero otherwise.
NUM_8K	The number of 8-Ks filed by a given firm in a given fiscal year.
NUM_701	The number of 8-Ks filed under Item 7.01 (Regulation Fair Disclosure) by a given firm in a given fiscal year.
NUM_801	The number of 8-Ks filed under Item 8.01 (Other Events) by a given firm in a given fiscal year.
Price	Natural logarithm of the average closing sharing price during five days before or after 8-K filing dates.
ReturnVol	The variance of the stock's daily return during five days before or after 8-K filing dates.
ROA	Earnings before extraordinary items scaled by lagged total assets.
SE	The squared error in the mean analyst forecast scaled by absolute value of actual EPS, measured during 45 days before or 30 days after a non-earnings 8-K filing.
Size	Natural logarithm of total sales for the firm during the year.
Trades	Natural logarithm of the average number of trades per day, measured during five days before or after 8-K filing dates. This variable is available for Nasdaq firms only.
Volume	Natural logarithm of the average daily dollar volume of trading during five days before or after 8-K filing dates.
Z_Connection	*Connection* standardized every year to have mean zero and standard deviation of one.

Appendix B. Reportable Events on Form 8-K

The SEC created Form 8-K in 1936 and made significant amendments in 1977 which established the filing deadline of five business days for some corporate events and 15 calendar days for others. The 1977 amendments followed by various modifications of items on 8-K (including items required under Reg FD) constitute the general structure of Form 8-K that existed until 2004. Immediately following the passage of Reg FD in 2000, the SEC created a separate Item (Item 9) and modified an existing Item (Item 5) on Form 8-K to allow companies to either file or furnish a report in compliance with Reg FD (see 17 CFR 249.308). Effective August 23, 2004, the SEC's Rule 33-8400 expands the number of events for which firms are required to file Form 8-K and reorganizes the reportable events into topical categories using a new numbering system with nine section headings. Sections 1-6 include events related to firms' business and operations, financial information, securities and trading markets, matters related to accountants and financial statements, corporate governance and management, and asset-backed securities. Section 7 includes items that firms are required to disclose according to Reg FD and Section 8 includes other material events unspecified by the SEC. Firms can either furnish a report under Item 7.01 or file a report under Item 8.01 to comply with Reg FD. Section 9 includes financial statements and exhibits. Rule 33-8400 also mandates timelier 8-K filings and shortens the filing deadline to four business days for events specified in Sections 1-6 and 9. The SEC encourages prompt reporting for events filed under Sections 7 and 8. Under Regulation FD, firms are required to file 8-K "simultaneously, in the case of an intentional disclosure; and promptly, in the case of a non-intentional disclosure". 17 CFR 243.101(d) defines "promptly" as "as soon as reasonably practicable (but in no event after the later of 24 hours or the commencement of the next day's trading on the New York Stock Exchange)". The following table shows the categories under the new numbering system as well as mapping of the old numbering system into the new one.

Current Item Number	Item Description	Previous Item Number
Section 1	*Registrant's Business and Operations*	
Item 1.01	Entry into a Material Definitive Agreement	-
Item 1.02	Termination of a Material Definitive Agreement	-
Item 1.03	Bankruptcy or Receivership	Item 3
Item 1.04	Mine Safety - Reporting of Shutdowns and Patterns of Violations	-
Section 2	*Financial Information*	
Item 2.01	Completion of Acquisition or Disposition of Assets	Item 2
Item 2.02	Results of Operations and Financial Condition	Item 12[a]
Item 2.03	Creation of a Direct Financial Obligation or an Obligation under an Off-Balance Sheet Arrangement of a Registrant	-
Item 2.04	Triggering Events That Accelerate or Increase a Direct Financial Obligation or an Obligation under an Off-Balance Sheet Arrangement	-
Item 2.05	Costs Associated with Exit or Disposal Activities	-
Item 2.06	Material Impairments	-

Section 3	*Securities and Trading Markets*	
Item 3.01	Notice of Delisting or Failure to Satisfy a Continued Listing Rule or Standard; Transfer of Listing	-
Item 3.02	Unregistered Sales of Equity Securities	-
Item 3.03	Material Modifications to Rights of Security Holders	-
Section 4	*Matters Related to Accountants and Financial Statements*	
Item 4.01	Changes in Registrant's Certifying Accountant	Item 4
Item 4.02	Non-Reliance on Previously Issued Financial Statements or a Related Audit Report or Completed Interim Review	-
Section 5	*Corporate Governance and Management*	
Item 5.01	Changes in Control of Registrant	Item 1
Item 5.02	Departure of Directors or Principal Officers; Election of Directors; Appointment of Principal Officers; Compensatory Arrangements of Certain Officers	Item 6
Item 5.03	Amendments to Articles of Incorporation or Bylaws; Change in Fiscal Year	Item 8
Item 5.04	Temporary Suspension of Trading Under Registrant's Employee Benefit Plans	Item 11[a]
Item 5.05	Amendments to the Registrant's Code of Ethics, or Waiver of a Provision of the Code of Ethics	-
Item 5.06	Change in Shell Company Status	-
Item 5.07	Submission of Matters to a Vote of Security Holders	-
Item 5.08	Shareholder Director Nominations	-
Section 6	*Asset-Backed Securities*	
Item 6.01	ABS Informational and Computational Material	-
Item 6.02	Change of Servicer or Trustee	-
Item 6.03	Change in Credit Enhancement or Other External Support	-
Item 6.04	Failure to Make a Required Distribution	-
Item 6.05	Securities Act Updating Disclosure	-
Section 7 - Regulation FD		
Item 7.01	Regulation FD Disclosure	Item 9[b]
Section 8 - Other Events		
Item 8.01	Other Events	Item 5
Section 9 - Financial Statements and Exhibits		
Item 9.01	Financial Statements and Exhibits	Item 7

(a) Item 12 and Item 11: The SEC amended Form 8-K to add Item 12 "Disclosure of Results of Operations and Financial Condition" effective March 28, 2003 (see Release No. 33-8176) and created new Item 11 which requires a registrant to disclose a pension fund blackout period effective March 31, 2003 (see Release No. 33-8216). In an interim guidance issued on March 27, 2003 (see Release No. 33-8216), the SEC states that "Registrants should furnish the information required by Item 12 under Item 9 ('Regulation FD Disclosure') of Form 8-K" and "continue to disclose the information required by Item 11 under Item 5 ('Other Information') of Form 10-Q or 10-QSB" because "the necessary programming to add Item 11 and 12 of Form 8-K to the EDGAR system is not yet complete". Item 11 and Item 12 were re-designated in the reorganized Form 8-K.

(b) Item 9: From October of 1996 to the end of 1998, firms report "Sales of Equity Securities Pursuant to Regulation S" using Item 9 (see Release No. 33-7505). Starting October of 2000 and before the new 8-K rules became effective in August of 2004, firms can use either Item 9 to furnish a report or Item 5 ("other events") to file a report under Reg FD (see Release No. 33-7881).

Appendix C. Constructing Social Connections

The BoardEx database provides social network data on company officials (including top executives and board of directors). It collects information on company personnel annually, beginning in 2000 and organizes the data as time series of individual curriculum vitae. The curriculum vitae contain college, graduate and professional education and degree information, past employment history, current employment status. BoardEx also provides information on executives' other social activities such as club memberships, positions held in various foundations and charitable groups, etc. However, over 75% of the data do not have start and/or end dates for these other social activities. In such cases, we cannot identify whether individuals attended these activities at the same time, or whether they are connected through these social activities before or after their current positions. For this reason, we leave out social connections through these other social activities in our main analysis (see also Engelberg, Gao and Parsons 2012; Fracassi and Tate 2012; and Ishii and Xuan 2014).

As the first step, we categorize all firms in BoardEx into two types: investment firms and non-investment firms. Following Cai et al. (2014), we define investment firms as firms classified by BoardEx as "investment companies", "private equity", or "speciality and other finance". There are 625 investment firms reported in BoardEx database. Most of them are investment banks, asset management firms, mutual funds, private equity firms, and other trading companies. Other than top executives and directors, the most common titles of individuals from investment firms include (Regional/Divisional) Managing Director, Portfolio Manager, Associates, Analyst, etc.

We construct a non-investment firm's social connections with the investment community by examining whether the non-investment firm's CEO/CFO/director and an individual from an investment firm have current or past overlap in employment or education. We consider an individual from a non-investment firm and an individual from an investment firm to be connected if one of the following criteria is met: (1) they graduated from the same educational institution (e.g, Harvard Business School) within one year - we require that two executives be in the same school, such as business school, medical school, or law school if the information is available; (2) they overlap at the same employer in the past or in the current year. The current year employment overlap captures the connections when a non-investment firm's CEO/CFO/director and an individual from an investment firm sit on the same board of directors of a third company; or, when a non-investment firm's CEO/CFO/director serves as an executive or director at an investment firm in the current year. Finally, we obtain the number of investment firms a company has social connections with, denoted as *Connection*.

References

Agrawal, A., S. Chadha, M. A. Chen. 2003. Who is afraid of Reg FD? The behavior and performance of sell-side analysts following the SEC's Fair Disclosure rules. Journal of Business 79(6): 2811-2834.

Bailey, W., H. Li, C. Mao, R. Zhong. 2003. Regulation fair disclosure and earnings information: Market, analyst, and corporate responses. Journal of Finance 58(6): 2487-2514

Barron, O., D. Byard, O. Kim. 2002. Changes in analysts' information around earnings announcements. The Accounting Review 77(4): 821-846.

Barron, O., D. Byard, Y. Yu. 2008. Earnings surprises that motivate analysts to reduce average forecast error. The Accounting Review 83(2): 303-325.

Barron, O., O. Kim, S. Lim, D. Stevens. 1998. Using analysts' forecasts to measure properties of analysts' information environment. The Accounting Review 73(4): 421-433.

Brown, L., A. Call, M. Clement, N. Sharp. 2015. Inside the "black box" of sell-side financial analysts. Journal of Accounting Research 53(1): 1-47.

Cai, J., R. Walkling, K. Yang, 2014. The price of street friends: Social networks, informed trading, and shareholder costs. Journal of Financial and Quantitative Analysis, Forthcoming.

Carter, M., B. Soo. 1999. The relevance of Form 8-K reports. Journal of Accounting Research 37(1): 119-132.

Christensen, D., M. Mikhail, B. Walther, L. Wellman. 2014. From K Street to Wall Street: Politically connected analysts and stock recommendations. Working paper. Pennsylvania State University.

Cohen, L., A. Frazzini, C. Malloy. 2008. The small world of investing: Board connections and mutual fund returns. Journal of Political Economy 116(5): 951-979.

Cohen, L., A. Frazzini, C. Malloy. 2010. Sell-side school ties. Journal of Finance 65(4): 1409-1437.

Conrad, J., C. Niden. 1992. Order flow, trading costs and corporate acquisition announcements. Financial Management 21(4): 22-31.

Engelberg, J., P. Gao, C. Parsons. 2012. Friends with money. Journal of Financial Economics 103 (1): 169-188.

Fischer, C. 1982. To Dwell among Friends. The University of Chicago Press.

Fracassi, C., G. Tate. 2012. External networking and internal firm governance. Journal of Finance 67(1): 153-194.

Green, T, R. Jame, S. Markov, M. Subasi. 2014. Access to management and the informativeness of analyst research. Journal of Financial Economics 114(2): 239-255

Heflin, F., K. Subramanyam, Y. Zhang. 2003. Regulation FD and the financial information environment: Early evidence. The Accounting Review 78(1): 1-37.

Hochberg Y., A. Ljungqvist, Y. Lu. 2007. Whom you know matters: Venture capital networks and investment performance. Journal of Finance 62(1): 251-301.

Hong, H., T. Lim, J. Stein. 2000. Bad news travels slowly: Size, analyst coverage, and the profitability of momentum strategies. Journal of Finance 55(1): 265-295.

Huang, W., H. Lu, X. Wang. 2014. Once lucky, always lucky? Institutional trading in a connected world. Unpublished working paper. Hong Kong Polytechnic University.

Ishii, J., Y. Xuan. 2014. Acquirer-target social ties and merger outcomes. Journal of Financial Economics 112(3): 344-363.

Krinsky, I., J. Lee. 1996. Earnings announcements and the components of the bid-ask spread. Journal of Finance 51(4): 1523-1535.

Lee, C., B. Mucklow, M. Ready. 1993. Spreads, depths, and the impact of earnings information: an intraday analysis. Review of Financial Studies 6(2): 345-374.

Lerman, A., J. Livnat. 2010. The new Form 8-K disclosures. Review of Accounting Studies 15(4): 752-778.

Mohanram, P., S. Sunder. 2006. How has Regulation FD affected the operations of financial analysts? Contemporary Accounting Research 23(2): 491-525.

Rubin, A., B. Segal, D. Segal. 2013. The interpretation of non-earnings news and analysts' skill. Unpublished working paper. Simon Fraser University.

Schwartz, K., B. Soo. 1995. An analysis of Form 8-K disclosures of auditor changes by firms approaching bankruptcy. Auditing: A Journal of Practice & Theory 14(1): 125-136.

Schwartz, K., B. Soo. 1996. The association between auditor changes and reporting lags. Contemporary Accounting Research 13(1): 353-370.

Singh, A., M. Zaman, C. Krishnamurti. 1994. Liquidity changes associated with open market repurchases. Financial Management 23(1): 47-55.

Soltes, E. 2014. Private Interaction between firm management and sell-side analysts. Journal of Accounting Research 52(1): 245-272.

Stuart, E. 2010. Matching methods for causal inference: a review and a look forward. Statistical Science 25(1):1-21.

Venkatesh, P., R. Chiang. 1986. Information asymmetry and the dealer's bid-ask spread: A case study of earnings and dividend announcements. Journal of Finance 41(5): 1089-1102.

Wang, I. 2007. Private earnings guidance and its implications for disclosure regulation. The Accounting Review 82(5): 1299-1332.

Zhang, X. 2006. Information uncertainty and stock returns. Journal of Finance 61(1): 105-137.

Figure 1. Changes in 8-K Filings during Sample Period 1993-2012
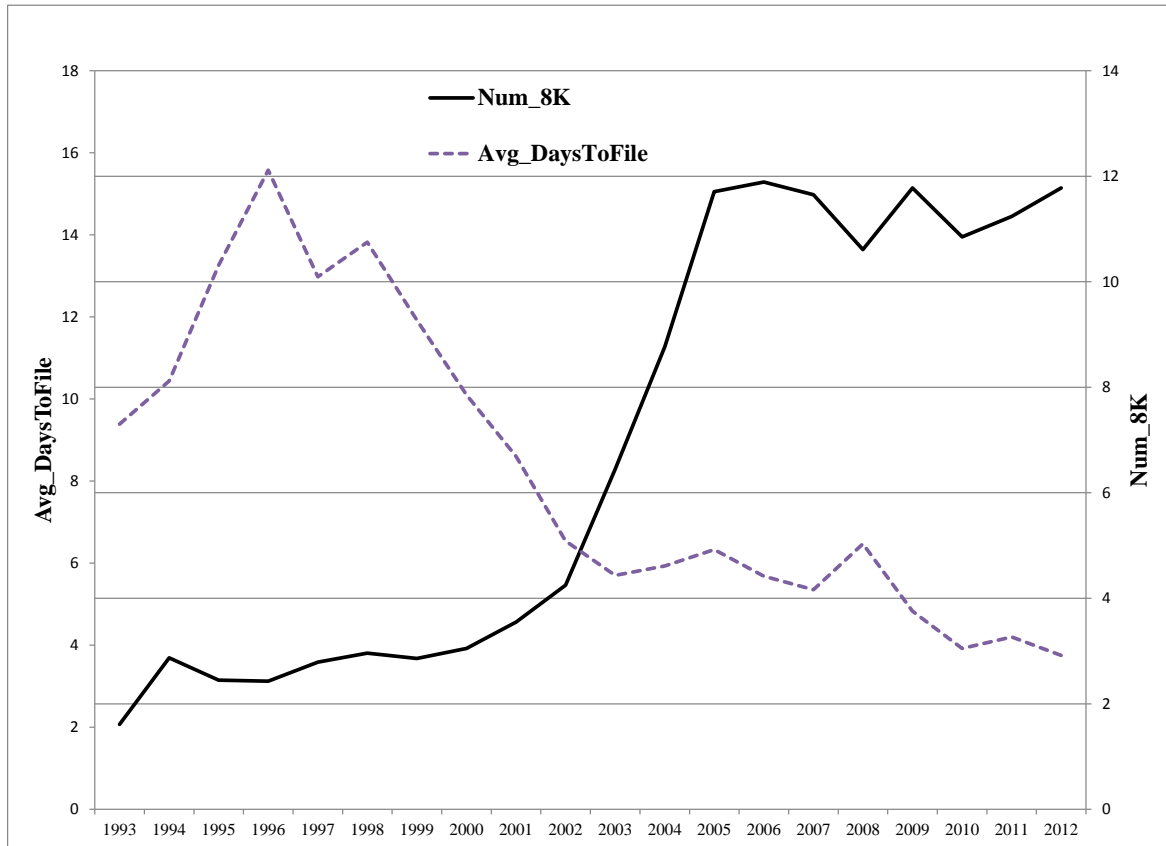
The graph plots the mean of *Num_8K* and *Avg_DaysToFile* during the sample period 1993-2012. The left vertical axis is for *Avg_DaysToFile* and the right vertical axis is for *Num_8K*. *Num_8K* is the number of 8-K filings per firm-year and *Avg_DaysToFile* the average number of days between 8-K filing date and the event date for a given firm in a given year.

Table 1. Social Connections with the Investment Community for 8-K Filing Firms

This table reports summary statistics of social connections for a sample of firms where we have 8-K filing data from S&P Filing Dates database, social connection data from BoardEx, and analyst forecast data from I/B/E/S. The sample period is from year 2001 to 2012. The sample contains 14,176 firm-years and 3,326 public firms. The table presents (1) the average level and distribution of firms' number of directors, CEOs and CFOs; (2) the average level and distribution of firms' social connections with the investment community. *Connection* is defined as total number of investment firms a non-investment firm has social connections with. *Z_Connection* is *Connection* standardized every year to have mean zero and standard deviation of one.

	N of Firm-years	Mean	Std Dev	P25	Median	P75
Number of Directors	14,176	7.859	2.590	6	8	9
Number of CEO	14,176	1.000	0.136	1	1	1
Number of CFO	14,176	1.182	0.470	1	1	1
Connection	14,176	72.005	51.699	31	60	101
Connection via						
Employment	14,176	59.211	47.429	22.500	47	84
Education	14,176	19.863	16.803	7	15	28
Connection via						
Directors	14,176	63.315	48.919	25	51	89
CEO	14,176	6.349	10.470	1	3	7
CFO	14,176	9.926	14.174	1	4	14
Z_Connection	14,176	0	1	-0.760	-0.140	0.640

Table 2. Characteristics of Form 8-K Filings

This table shows the comparisons of 8-K filings across firms with low, medium and high connections over three separate filing periods – fiscal years prior to 2000, 2001-2003 and 2005-2012. Firms with the average post-Reg FD *Z_Connection* in the top, middle and bottom terciles are in the high, medium and low connection groups, respectively. *Z_Connection* is *Connection* standardized every year to have mean 0 and standard deviation of 1, where *Connection* is the total number of investment firms a non-investment firm has social connections with. *Num_8K* is the number of 8-K filings per firm-year. Δ*Num_8K* is the change in the average number of 8-Ks filed from one filing period to the next. Number of 8-Ks filed under Item 7.01 (Regulation FD Disclosure) and Item 8.01 (Other Events) are indicated by variables *Num_701 and Num_801*. Significant differences in mean (median) between high and low connection firms at the 10%, 5%, and 1% levels based on two-sided t-tests (Wilcoxon rank-sum tests) are denoted *, **, and ***, respectively.

Panel A: Number of 8-K filings by a given firm per year

Variable	Connection-Low Mean	Connection-Low Median	Connection-Med Mean	Connection-Med Median	Connection-High Mean	Connection-High Median	High minus Low Mean	High minus Low Median
Connection	29	25	60	61	106	105	77 ***	80 ***
Z_Connection	-1.076	-1.09	-0.329	-0.345	0.873	0.774	1.949 ***	1.865 ***
Num_8K								
Pre-FD	2.506	2	2.601	2	3.796	3	1.290 ***	1 ***
Post-FD: 2001-2003	7.233	6	7.865	6	9.885	8	2.652 ***	2 ***
Post-FD: 2005-2012	15.023	14	15.605	14	16.511	15	1.488 ***	1 ***
ΔNum_8K								
2001-2003 minus Pre-FD	3.064	2.500	3.299	2.500	4.297	3.000	1.233 ***	0.500 ***
2005-2012 minus 2001-2003	8.257	7.667	8.528	7.917	8.221	7.875	-0.04	0.208

Panel B: Number of 8-Ks filed under Item 7.01 and Item 8.01 in the post-FD periods

Variable	Connection - Low Mean	Connection - Low Median	Connection - Med Mean	Connection - Med Median	Connection - High Mean	Connection - High Median	High minus Low Mean	High minus Low Median
Post-FD: 2001-2003								
Num_701	2.175	1	2.364	2	2.656	1	0.481 ***	0
Num_801	3.643	3	3.974	3	5.543	4	1.900 ***	1 ***
Post-FD: 2005-2012								
Num_701	3.387	1	3.265	1	3.311	1	-0.08	0
Num_801	3.434	2	3.603	2	4.159	3	0.725 ***	1 ***

Table 3. Matched-Sample Construction and Summary Statistics for Information Measures

This table reports matched sample construction and summary statistics for measures related to analyst information environment. Panel A compares the connection and size of the matched low and high connection firms. *Z_Connection* is *Connection* standardized every year, where *Connection* is the total number of investment firms a non-investment firm has social connections with. Panel B presents descriptive statistics of measures related to analyst information. Definitions of all variables are reported in Appendix A. The pre-filing and post-filing periods are denoted with subscript $_{pre}$ and $_{post}$ respectively. This panel also tests whether there are significant changes in these variables from pre-filing period to post-filing period. The changes which are significantly different are denoted right next to the variables measured during the post-filing periods. Significant differences at the 10%, 5%, and 1% levels are denoted *, **, and ***, respectively. All variables are winsorized at 1% and 99%.

Panel A: Low and high connection firms matched on size

Variable	Connection-Low			Connection-High			High minus Low	
	N	Mean	Median	N	Mean	Median	Mean	Median
Z_Connection	4,683	-1.030	-0.998	4,683	0.855	0.726	1.885 ***	1.724 ***
Size	4,683	6.103	6.163	4,683	6.099	6.148	-0.004	-0.015

Panel B: Descriptive statistics for information measures

Variable	N	Mean		Std Dev	P25	Median		P75
D_{pre}	26,403	0.048		0.144	0.001	0.004		0.025
D_{post}	26,403	0.038	***	0.116	0.001	0.003	***	0.020
SE_{pre}	26,403	0.553		1.802	0.004	0.032		0.232
SE_{post}	26,403	0.406	***	1.353	0.002	0.019	***	0.148
$Commonality_{pre}$	26,403	69.25%		36.03%	47.30%	88.11%		97.82%
$Commonality_{post}$	26,403	66.42%	***	36.89%	38.83%	84.78%	***	96.92%
$Idiosync_{pre}$	26,403	209.758		942.359	0.110	2.259		32.745
$Idiosync_{post}$	26,403	378.707	***	1686.440	0.194	4.343	***	57.303
$Common_{pre}$	26,403	105.639		356.669	0.746	7.266		47.393
$Common_{post}$	26,403	178.186	***	610.365	0.860	9.465	***	68.503
$lnIdiosync_{pre}$	26,403	2.064		2.277	0.104	1.181		3.519
$lnIdiosync_{post}$	26,403	2.429	***	2.471	0.177	1.676	***	4.066
$lnCommon_{pre}$	26,403	2.422		2.037	0.558	2.112		3.879
$lnCommon_{post}$	26,403	2.651	***	2.219	0.620	2.348	***	4.241

Table 4. Univariate Analysis

This table compares information measures for the matched low and high connection firms. Sample contains 4,683 pairs of matching between low connection and high connection firms and 26,403 non-earnings 8-K filings from year 2001 to 2012. *Z_Connection* is *Connection* standardized every year, where *Connection* is the total number of investment firms a non-investment firm has social connections with. *Commonality* is the proportion of common information to the total information contained in analyst forecasts. *lnIdiosync* is the natural logarithm of *Idiosync*, where *Idiosync* is the precision of idiosyncratic information contained in analyst forecasts. *lnCommon* is the natural logarithm of *Common*, where *Common* is the precision of common information contained in analyst forecasts. The pre-filing and post-filing periods are denoted with subscript $_{pre}$ and $_{post}$ respectively. All variables are winsorized at 1% and 99%. Significant differences in mean (median) between high and low connection firms at the 10%, 5%, and 1% levels based on two-sided t-tests (Wilcoxon rank-sum tests) are denoted *, **, and ***, respectively.

Variable	Connection-Low			Connection-High			High minus Low	
	N	Mean	Median	N	Mean	Median	Mean	Median
$Z\_Connection$	12,542	-1.027	-1.000	13,861	0.856	0.753	1.882 ***	1.753 ***
$Commonality_{pre}$	12,542	71.13%	88.87%	13,861	67.54%	86.57%	-3.58% ***	-2.29% ***
$Commonality_{post}$	12,542	67.06%	85.43%	13,861	65.84%	84.17%	-1.22% ***	-1.26% ***
$lnIdiosync_{pre}$	12,542	1.952	1.052	13,861	2.166	1.321	0.214 ***	0.270 ***
$lnIdiosync_{post}$	12,542	2.367	1.566	13,861	2.484	1.769	0.117 ***	0.203 ***
$lnCommon_{pre}$	12,542	2.430	2.103	13,861	2.415	2.124	-0.015	0.021
$lnCommon_{post}$	12,542	2.615	2.290	13,861	2.683	2.406	0.068 **	0.116 *

Table 5. Descriptive Statistics for Regression Variables

This table reports summary statistics of all variables used in regression analysis for the matched sample. Sample contains 4,683 pairs of matching between low connection and high connection firms and 26,403 non-earnings 8-K filings from year 2001 to 2012. Panel A reports descriptive statistics of all independent variables. *Z_Connection* is *Connection* standardized every year, where *Connection* is the total number of investment firms a non-investment firm has social connections with. *Size* is natural logarithm of total sales for the firm during the year. *ROA* is earnings before extraordinary items scaled by lagged total assets. *MTB* is the ratio of market value of common equity to book value at the beginning of the fiscal year. *Leverage* is the total liabilities scaled by total assets at the beginning of the fiscal year. *Loss* is an indicator variable which equals one if the firm incurs a loss during that year, and zero otherwise. *absCAR* is the absolute value of cumulative abnormal return over the three-day window around the 8-K filing date. *GDPR* is quarterly change in the seasonal growth rate in gross domestic product (GDP), obtained from Federal Reserve. *Horizon* is the number of days between the 8-K filing date and annual earnings announcement date. *Analyst* is the number of analysts following the firm. All variables are winsorized at 1% and 99%. Panel B presents the Pearson and Spearman correlations among all regression variables. Pearson (Spearman) correlations are presented above (below) the diagonal. Correlations significant at the 10% level are marked in bold.

Panel A: Descriptive statistics

Variable	N	Mean	Std Dev	P25	Median	P75
Z_Connection	26,403	-0.038	1.016	-0.966	0.373	0.776
Size	26,403	6.366	1.549	5.351	6.419	7.446
ROA	26,403	0.013	0.160	-0.014	0.035	0.091
MTB	26,403	3.487	3.857	1.486	2.305	3.926
Leverage	26,403	0.518	0.237	0.337	0.517	0.688
Loss	26,403	0.292	0.455	0	0	1
absCAR	26,403	0.041	0.046	0.011	0.026	0.052
GDPR	26,403	3.829	2.705	3.105	4.374	6.308
Horizon	26,403	240.771	104.009	149	246	328
Analyst	26,403	16.848	10.550	9	14	21

Table 5. Descriptive Statistics for Regression Variables (Continued)

Panel B: Correlation

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
(1) Z_Connection		-0.062	-0.026	0.064	0.044	0.004	0.026	0.056	-0.001	0.082	0.048	0.005	-0.029	0.009	-0.004	0.127
(2) $Commonality_{pre}$	-0.063		0.516	-0.731	-0.403	0.315	0.037	0.050	0.041	-0.052	0.002	-0.002	0.036	0.037	0.098	-0.078
(3) $Commonality_{post}$	-0.050	0.565		-0.416	-0.729	0.004	0.341	0.047	0.045	-0.089	-0.008	0.004	0.021	0.005	0.140	-0.087
(4) $lnIdiosync_{pre}$	0.068	-0.823	-0.506		0.652	0.219	0.328	0.019	0.066	0.042	-0.049	-0.184	-0.093	0.072	-0.286	0.130
(5) $lnIdiosync_{post}$	0.060	-0.496	-0.816	0.698		0.385	0.200	0.027	0.068	0.093	-0.030	-0.185	-0.070	0.094	-0.329	0.136
(6) $lnCommon_{pre}$	0.003	0.245	0.013	0.208	0.322		0.568	0.093	0.174	0.050	-0.062	-0.294	-0.088	0.166	-0.274	0.125
(7) $lnCommon_{post}$	0.023	0.034	0.295	0.282	0.162	0.513		0.104	0.180	0.036	-0.059	-0.282	-0.072	0.144	-0.280	0.098
(8) Size	0.058	0.025	0.009	0.036	0.049	0.100	0.105		0.372	-0.200	0.283	-0.325	-0.145	-0.072	-0.067	0.402
(9) ROA	-0.007	-0.011	-0.011	0.183	0.181	0.265	0.254	0.248		-0.066	-0.004	-0.696	-0.138	0.084	-0.041	0.084
(10) MTB	0.030	-0.017	-0.040	0.103	0.127	0.140	0.124	-0.198	0.238		0.131	0.075	0.048	0.068	-0.020	0.034
(11) Leverage	0.043	0.016	-0.007	-0.063	-0.040	-0.067	-0.068	0.283	-0.178	-0.137		-0.020	-0.062	-0.113	-0.061	-0.017
(12) Loss	-0.005	0.018	0.023	-0.208	-0.206	-0.289	-0.274	-0.301	-0.788	-0.046	-0.021		0.180	-0.135	0.054	-0.098
(13) absCAR	-0.036	0.048	0.028	-0.101	-0.084	-0.077	-0.072	-0.147	-0.124	0.041	-0.075	0.180		-0.107	0.003	-0.071
(14) GDPR	0.022	0.025	0.025	0.063	0.062	0.137	0.123	-0.091	0.138	0.161	-0.122	-0.121	-0.073		-0.013	0.008
(15) Horizon	0.000	0.101	0.143	-0.275	-0.313	-0.240	-0.237	-0.065	-0.043	-0.025	-0.063	0.055	0.005	0.010		-0.192
(16) Analyst	0.132	-0.108	-0.116	0.153	0.158	0.126	0.099	0.420	0.092	0.105	0.022	-0.070	-0.065	-0.042	-0.189	

Table 6. Regression of Commonality on Social Connections with the Investment Community

This table reports results from OLS regression of *Commonality* on social connections with the investment community using matched sample. *Commonality* measures the percentage of common information. Subscripts $_{pre}$ and $_{post}$ indicate the pre-filing and post-filing periods. The definitions of all other variables are reported in the Appendix A. Standard errors are clustered at the firm level and *t*-statistics are reported in the brackets. Year and industry fixed effects are all included. Significance at the 10%, 5%, and 1% level are denoted *, **, and ***, respectively. This table also tests whether there is significant difference between coefficients of *Z_Connection* in Column (1) and Column (2) by using Wald Chi-square test. The difference between the two coefficients, significance, and χ^2 statistic are reported at the bottom of the table.

	$Commonality_{pre}$	$Commonality_{post}$
	(1)	(2)
Intercept	53.086 ***	47.877 ***
	[7.990]	[6.990]
Z_Connection	-1.579 **	-0.052
	[-2.330]	[-0.080]
Size	1.430 **	1.457 **
	[2.000]	[1.980]
ROA	15.280 **	18.347 ***
	[2.330]	[3.140]
MTB	-0.262	-0.572 ***
	[-0.920]	[-2.560]
Leverage	-2.927	-3.358
	[-0.600]	[-0.700]
Loss	4.427 **	5.731 ***
	[2.120]	[3.010]
absCAR	29.686 ***	13.349
	[3.420]	[1.260]
GDPR	1.771 ***	0.803
	[3.110]	[1.600]
Horizon	0.032 ***	0.049 ***
	[4.640]	[9.010]
Analyst	-0.212 **	-0.249 **
	[-2.500]	[-2.450]
Year fixed effects	Yes	Yes
Industry fixed effects	Yes	Yes
N	26,403	26,403
Adj. R²	7.31%	7.73%
Difference between coefficients on *Z_Connection*	1.527*** [χ^2= 9.67]	

Table 7. Regression of Precision of Idiosyncratic Information on
Social Connections with the Investment Community

This table reports results from OLS regression of *lnIdiosync* on social connections with the investment community using matched sample. *lnIdiosync* is the natural logarithm of *Idiosync* and measures the precision of private information. Subscripts ~pre~ and ~post~ indicate the pre-filing and post-filing periods. The definitions of all other variables are reported in the Appendix A. Standard errors are clustered at the firm level and *t*-statistics are reported in the brackets. Year and industry fixed effects are all included. Significance at the 10%, 5%, and 1% level are denoted *, **, and ***, respectively. This table also tests whether there is significant difference between coefficients of *Z_Connection* in Column (1) and Column (2) by using Wald Chi-square test. The difference between the two coefficients, significance, and χ^2 statistic are reported at the bottom of the table.

	$lnIdiosync_{pre}$	$lnIdiosync_{post}$
	(1)	(2)
Intercept	5.014 ***	5.382 ***
	[10.020]	[11.170]
Z_Connection	0.101 **	0.040
	[2.290]	[0.880]
Size	-0.062	-0.040
	[-1.470]	[-0.950]
ROA	-1.290 ***	-1.317 ***
	[-2.770]	[-3.480]
MTB	0.017	0.049 ***
	[1.350]	[3.590]
Leverage	-0.565 **	-0.550 *
	[-1.990]	[-1.930]
Loss	-1.077 ***	-1.146 ***
	[-8.370]	[-9.030]
absCAR	-3.203 ***	-2.207 ***
	[-5.950]	[-3.330]
GDPR	-0.053	0.015
	[-1.630]	[0.520]
Horizon	-0.006 ***	-0.008 ***
	[-16.400]	[-21.130]
Analyst	0.017 ***	0.018 ***
	[3.510]	[3.620]
Year fixed effects	Yes	Yes
Industry fixed effects	Yes	Yes
N	26,403	26,403
Adj. R^2	16.42%	20.00%
Difference between coefficients on Z_Connection	-0.061** $[\chi^2= 4.97]$	

Table 8. Regression of Precision of Common Information on Social Connections with Investment Community

This table reports results from OLS regression of *lnCommon* on social connections with the investment community using matched sample. *lnCommon* is the natural logarithm of *Common* and measures the precision of common information. Subscripts $_{pre}$ and $_{post}$ indicate the pre-filing and post-filing periods. The definitions of all other independent variables are reported in Appendix A. Standard errors are clustered at the firm level and *t*-statistics are reported in the brackets. Year and industry fixed effects are all included. Significance at the 10%, 5%, and 1% level are denoted *, **, and ***, respectively. This table also tests whether there is significant difference between coefficients of *Z_Connection* in Column (1) and Column (2) by using Wald Chi-square test. The difference between the two coefficients, significance, and χ^2 statistic are reported at the bottom of the table.

	$lnCommon_{pre}$	$lnCommon_{post}$
	(1)	(2)
Intercept	4.365 ***	4.190 ***
	[11.240]	[11.810]
Z_Connection	-0.044	0.023
	[-1.130]	[0.570]
Size	0.002	0.073 *
	[0.070]	[1.870]
ROA	-0.364	-0.236
	[-1.170]	[-0.790]
MTB	0.020 *	0.026 **
	[1.660]	[2.490]
Leverage	-0.556 **	-0.843 ***
	[-2.510]	[-3.670]
Loss	-1.186 ***	-1.163 ***
	[-10.350]	[-9.760]
absCAR	-1.968 ***	-1.770 ***
	[-3.790]	[3.070]
GDPR	0.064 ***	0.040 *
	[3.060]	[1.800]
Horizon	-0.005 ***	-0.006 ***
	[-16.540]	[-20.980]
Analyst	0.014 ***	0.004
	[3.020]	[0.710]
Year fixed effects	Yes	Yes
Industry fixed effects	Yes	Yes
N	26,403	26,403
Adj. R^2	25.14%	23.96%
Difference between coefficients on Z_Connection	0.068*** $[\chi^2= 7.38]$	

Table 9. Subsamples of 8-K Filings under Different Items

This table reports results from OLS regression of information measures on social connections with the investment community using subsamples of 8-Ks under different items. Sample used in Panel A includes 8-K filings filed under item 7.01 or 8.01, and sample used in Panel B includes all other 8-K filings. *Commonality* measures the percentage of common information. Subscripts pre and post indicate the pre-filing and post-filing periods. *lnIdiosync* is the natural logarithm of *Idiosync* and measures the precision of private information. Subscripts pre and post indicate the pre-filing and post-filing periods. *Z_Connection* is *Connection* standardized every year, where *Connection* is the total number of investment firms a public firm has social connections with. All control variables are the same as in Table 6-8 and their definitions are reported in the Appendix A. Standard errors are clustered at the firm level and *t*-statistics are reported in the brackets. Year and industry fixed effects are all included. Significance at the 10%, 5%, and 1% level are denoted *, **, and ***, respectively. This table also tests whether there is significant difference between coefficients of *Z_Connection* in Column (1) and Column (2) and between coefficients of *Z_Connection* in Column (3) and Column (4) by using Wald Chi-square test. The difference between the two coefficients, significance, and χ^2 statistic are reported at the bottom of the table.

Panel A: 8-K filed under Item 7.01 or Item 8.01

	$Commonality_{pre}$	$Commonality_{post}$	$lnIdiosync_{pre}$	$lnIdiosync_{post}$
	(1)	(2)	(3)	(4)
Intercept	20.194 ***	15.912 ***	7.931 ***	7.324 ***
	[2.74]	[2.80]	[15.47]	[17.78]
Z_Connection	-1.562 *	0.614	0.099 *	-0.004
	[1.92]	[0.81]	[1.80]	[0.07]
Controls	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
N	15,348	15,348	15,348	15,348
Adj. R²	8.50%	8.40%	18.80%	21.30%
Difference between coefficients on *Z_Connection*	2.176*** [χ^2= 12.64]		-0.102*** [χ^2= 7.93]	

Table 9. Subsamples of 8-K Filings under Different Items (Continued)

Panel B: 8-K filed under neither Item 7.01 nor Item 8.01

	$Commonality_{pre}$	$Commonality_{post}$	$lnIdiosync_{pre}$	$lnIdiosync_{post}$
	(1)	(2)	(3)	(4)
Intercept	75.622 ***	74.186 ***	3.535 ***	3.486 ***
	[5.46]	[6.34]	[4.27]	[4.10]
Z_Connection	-1.652 **	-1.041	0.107 **	0.094 *
	[1.99]	[1.26]	[2.16]	[1.77]
Controls	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
N	11,055	11,055	11,055	11,055
Adj. R²	8.10%	8.80%	15.60%	20.00%
Difference between coefficients on *Z_Connection*	0.611 [χ^2= 0.68]		-0.012 [χ^2= 0.09]	

Table 10. Regression of Bid Ask Spread on Social Connections with Investment Community

This table reports results from OLS regression of *BidAsk* on social connections with the investment community. Sample contains 46,889 non-earnings 8-K filings from year 2001 to 2012. *BidAsk* is the natural logarithm of a stock's average proportional quoted bid-ask spread as (ask price-bid price)/average quoted price during five days pre or post 8-K filing dates. *Volume*, *MarketCap*, *Price*, *Trades*, and *ReturnVol* are measured during the corresponding periods. Subscripts $_{pre}$ and $_{post}$ indicate the pre-filing and post-filing periods. The definitions of all variables are reported in Appendix A. Standard errors are clustered at the firm level and *t*-statistics are reported in the brackets. Year and industry fixed effects are all included. Significance at the 10%, 5%, and 1% level are denoted *, **, and ***, respectively. This table also tests whether there is significant difference between coefficients of *Z_Connection* and *absCAR* in Column (1) and Column (2) by using Wald Chi-square test. The difference between the two coefficients, significance, and χ^2 statistic are reported at the bottom of the table.

	$BidAsk_{pre}$	$BidAsk_{post}$	$BidAsk_{pre}$	$BidAsk_{post}$
	(1)	(2)	(3)	(4)
Intercept	4.024 ***	4.180 ***	3.848 ***	4.019 ***
	[48.37]	[49.44]	[46.27]	[48.35]
Z_Connection	0.017 **	0.019 ***	0.009	0.006
	[2.48]	[2.78]	[1.19]	[0.78]
absCAR			0.375 ***	0.854 ***
			[4.71]	[9.20]
Z_Connection×absCAR			0.210 **	0.364 ***
			[2.02]	[3.96]
Horizon			0.208 ***	0.199 ***
			[16.67]	[16.10]
Volume	-0.164 ***	-0.162 ***	-0.168 ***	-0.175 ***
	[21.61]	[21.35]	[21.94]	[22.28]
MarketCap	-0.001	0.000	0.006	0.015 *
	[0.07]	[0.04]	[0.67]	[1.75]
Price	-0.430 ***	-0.434 ***	-0.428 ***	-0.431 ***
	[35.50]	[36.58]	[35.31]	[36.49]
NASDAQ	0.447 ***	0.471 ***	0.443 ***	0.452 ***
	[5.83]	[6.08]	[5.77]	[5.88]
Trades×NASDAQ	-0.069 ***	-0.070 ***	-0.069 ***	-0.068 ***
	[7.59]	[7.71]	[7.52]	[7.48]
ReturnVol	46.139 ***	39.709 ***	45.746 ***	34.028 ***
	[19.59]	[20.66]	[19.85]	[16.91]
Year fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
N	46,889	46,889	46,889	46,889
Adj. R²	67.30%	67.30%	67.70%	67.70%
Difference between coefficients on *Z_Connection*	0.157 $[\chi^2= 0.34]$		-0.003 $[\chi^2= 0.72]$	
Difference between coefficients on *absCAR*			0.479*** $[\chi^2= 27.54]$	
Difference between coefficients on *Z_Connection×absCAR*			0.154** $[\chi^2= 5.67]$	