

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

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

**Abstract:** We investigate the impact of Form 8-K filings on cross-firm differences in analysts' private or idiosyncratic information in the post-Reg FD era. Using firms' connections to the investment community to identify the likelihood of selective disclosure, we document differences in analysts' idiosyncratic information arising from selective disclosure before 8-K filings. While filings of 8-Ks pursuant to Reg FD attenuate the link between connections and analysts' idiosyncratic information, they do so only after selective disclosures have already resulted in some analysts having better private information. In addition, the connections continue to facilitate private information search after the filings of non-Reg FD-specific 8-Ks.

**JEL classification:** G14; M41

**Keywords:** Form 8-K filing; Selective disclosure; Connections; Analysts' idiosyncratic information.

## 1. Introduction

The Securities and Exchange Commission (SEC) issued Regulation Fair Disclosure (Reg FD) to address its growing concern that a “privileged few gain an informational edge” and “profit or avoid a loss at the expense of those kept in the dark.” Despite the intent of Reg FD, recent research finds evidence consistent with some analysts continuing to receive selective disclosures from private interactions with corporate management (e.g., Green, Jame, Markov, and Subasi 2014a; Brown, Call, Clement, and Sharp 2015) and with market participants pricing the risk of selective disclosure (Cai, Walkling, and Yang 2016).<sup>1</sup> Perhaps because of the difficulty in preventing selective disclosure, rather than forbidding selective disclosure, Reg FD requires firms to promptly file an 8-K to broadly disseminate information selectively disclosed to securities market professionals. Subsequently, SEC Rule 33-8400 expanded the number of events for which firms are required to file an 8-K and accelerated the filings deadlines, potentially improving the timeliness of public disclosure. We examine whether 8-K filings reduce the impact of selective disclosure post Reg FD.

We focus on Form 8-K because of its intended role to provide better and faster disclosure of material information. The SEC requires registrant firms to file Form 8-K to timely disclose material corporate events such as entry into a significant contract or new product development. More importantly, firms that selectively disclose material non-public information to securities market professionals or security holders at occasions such as analyst days or investor conferences are required to make that information public within 24 hours, a requirement that can be met by

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<sup>1</sup> As used in this study, “selective disclosure” refers to private communication between corporate management and one or more segments of the investment community without regard to whether the information communicated is material or immaterial.

filing Form 8-K (or by other methods that effect broad and non-exclusionary distribution of that information).

However, private communication between corporate management and the investment community may still occur without triggering 8-K filings. 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 information that, taken together, is material.”<sup>2</sup> Firms may also be strategic in filing 8-Ks. Management can time the filings of many 8-Ks within the confines of the regulations and bundle certain news items to avoid or minimize negative reactions from the capital markets (Goldstein and Wu 2015; Tian 2015; Segal and Segal 2016). Strategic filing of 8-Ks to “paper things up” (Brown et al. 2015) along with the “mosaic” exception cast doubt on the effectiveness of 8-K filings in leveling the playing field.

A challenge for researchers is the difficulty in identifying selective disclosure and any information advantage arising from it. We rely 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; Mohanram and Sunder 2006; Barron, Byard, and Yu 2008) to measure analysts’ private information arising from selective disclosure. BKLS is uniquely suited for our purpose because it allows us to disentangle the common and idiosyncratic components of analysts’ total information.

We draw on recent research that considers social network an important channel of private interactions (e.g., Cohen, Frazzini, and Malloy 2008, 2010; Engelberg, Gao, and Parsons 2012; Cai et al. 2016), and use firms’ social connections to the investment community as a measure of cross-firm differences in analysts’ private or idiosyncratic information. Using BoardEx data, we

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<sup>2</sup> <http://www.sec.gov/rules/final/33-7881.htm>

measure firms' connections to the investment community as the number of unique investment firms to which the CEO, CFO, or board members have education or employment connections (*Connection*).<sup>3</sup> High-, medium-, or low-connection firms are identified based on tercile rankings of *Connection* standardized every year. We then use a matched sample research design where low-connection firms are matched to high-connection firms of the closest size to minimize the effect of firm size on analyst information environment.

Using a large set of non-earnings announcement 8-Ks for our matched sample, we find that 8-K filings alter the relation between connections and both the proportion and precision of analysts' idiosyncratic information. Analysts who cover highly-connected firms have a higher proportion of idiosyncratic information and more precise idiosyncratic information prior to 8-K filings but not after. In contrast, connections are not associated with the precision of analysts' common information either before or after 8-K filings, evidence that firms' connections to the investment community are not simply a proxy for other firm attributes that indicate better public disclosures. We also find high-connection firms have relatively higher bid-ask spreads both before and after 8-K filings, consistent with investor concerns about informed trading due to selective disclosure around 8-K filings.

Further analyses reveal that the impact of 8-K filings varies with the type of 8-Ks. Reg FD-specific 8-Ks attenuate the association between firms' connections and analysts' idiosyncratic information. However, connections continue to facilitate information transfer after the filings of non-Reg FD-specific 8-Ks where the "mosaic" exception plays a more important role. The differential impact of Reg FD 8-Ks suggests that managerial discretion and the mosaic exception

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<sup>3</sup> Educational and employment connections is one proxy, but not the only proxy, for the likelihood of selective disclosure. Other examples include political connections (Christensen, Mikhail, Walther, and Wellman 2017), brokerage size (Mohanram and Sunder 2006) and investor conferences (Bushee, Jung, and Miller 2011; Green et al. 2014a and b).

reduce the effectiveness of 8-K filings in leveling the playing field. In addition, the impact of 8-K filings is concentrated in low cyclical industries where analysts benefit more from firm-specific selective disclosure compared to high-cyclical industries.

We conduct additional firm-level analyses on the *average* analyst response to 8-K filings to corroborate the insights obtained from the BKLS measures. Following prior literature we find that analysts who cover less connected firms revise their earnings forecasts sooner after 8-K filings and their forecast revisions are of greater magnitude, compared to analysts covering highly-connected firms, suggesting on average analysts covering less-connected firms are less likely to have selectively learned the information prior to the 8-K (Charoenrook and Lewis 2009; Kross and Suk 2012).

Although our tests are generally limited to firm-level tests, we conduct within-analyst tests using analysts who cover both high- and low-connection firms to triangulate our firm-level analysis. We find a consistent pattern of quicker revisions following 8-Ks filed for the less connected firms than for high-connection firms covered by the same analyst. We also find a pattern of greater relative forecast accuracy for high-connection firms prior to 8-K filings but not after 8-Ks are filed. Together these results imply pre-filing selective disclosure allows some analysts covering highly-connected firms to have better private information pre-8-K.

Our study makes several important contributions to the literature. We contribute to recent research documenting various channels through which investment professionals seek an information edge in the post-Reg FD era (e.g., Green et al. 2014a; Soltes 2014). Findings in our study suggest that connections play a critical role in analysts' idiosyncratic information discovery. 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. While filings of 8-Ks pursuant to Reg FD appear to attenuate the link between connections and cross-firm differences in analysts’ idiosyncratic information, they do so only after selective disclosures have already resulted in some analysts having better private information. Thus, the inability of the SEC to observe private interactions undermines the effectiveness of Reg FD, consistent with Soltes (2018). Our findings suggest that 8-Ks (or other wide-distribution channels) as the only remedy Reg FD provides are unlikely to provide a sufficient tool for leveling the information playing field.

Our study also extends a growing stream of literature examining the effect of social networks on the financial markets (e.g., Cohen et al. 2010; Cai et al. 2016). Our results reinforce the perceptions of market participants that in the post-Reg FD era, private communications between corporate management and the investment community occur through broad and diverse social networks (Cai et al. 2016) and beyond highly visible events such as the broker-hosted conferences.

Some important caveats remain. First, regardless of how studies measure connections (e.g., connections of a covered firm’s senior officers to the investment community, connections inferred from brokerage houses’ political contributions, or an individual analyst’s educational ties to the firm she covers), direct evidence in the sense of observing private conversations between individuals is elusive. Soltes’ (2014) approach of obtaining internal communication records at one single firm offers a glimpse of what one can learn from a field study that is not typically feasible in archival research. Second, our evidence that 8-Ks remediate differences in the information advantage held by some analysts covering high-connection firms does not permit us to conclude firms are violating Reg FD. The information advantage may arise from immaterial disclosures. In practice, there is considerable uncertainty about what constitutes material information among both

managers and regulators (Soltes 2018). Finally, we also acknowledge that other investment professionals (Huang, Lu, and Wang 2018), such as buy-side analysts, likely benefit from selective disclosure stemming from firms' connections to the investment community as well and we leave that for future research.

## **2. Literature Review**

### ***2.1 Social network and analysts' private information post Reg FD***

The practice of selective disclosure and the related impact on the investment community have evolved since the implementation of Reg FD. Recent studies show that private interactions with corporate management continue to help investment professionals including analysts and large investors without necessarily violating any regulation (Hochberg, Ljungqvist, and Yu 2007; Cohen et al. 2008; Bushee, Jung, and Miller 2017). For example, private interactions at brokerage-hosted investor conferences lead to more informative analyst research (Green et al. 2014a). Likewise, analysts interviewed by Brown et al. (2015) describe using private phone calls with management to ask questions they do not want to share with other analysts, in addition to going over modeling questions and gauging vocal cues from management.

While corporate management spends a significant amount of time interacting with sell-side analysts, only a small fraction of these private interactions can be located via public records (Soltes 2014). This makes selective disclosure difficult to identify. Recent research uses social networks to infer analysts' potential sources of privileged information. For example, identifying selective disclosure using educational connections analysts share with senior executives and board members of covered firms, Cohen et al. (2010) find that profitability of analyst recommendations improves with educational connections; Christensen et al. (2017) show that individual analysts at politically



connected brokerage houses also issue more profitable upgrades than analysts at non-connected brokerage houses.<sup>4</sup>

Analogous to Christensen et al.'s (2017) examination of brokerage houses' political connections (instead of analysts themselves) we examine the connections of senior officers and board members of a firm with the investment community. We assume that private information is more likely to trickle down to analysts when the investment community shares more connections with senior officers and board members of covered firms. Corporate management can be connected with investment professionals through education, professional associations, club memberships, and past working relationships. These connections reflect a broad range of private interactions between firm management and analysts outside of the official corporate disclosure channels and beyond highly visible events such as broker-hosted conferences. As one analyst described, the "backroom chatter" is not just in the backroom, "it's everywhere" (Brown et al. 2015). Consistent with this conjecture, Cai et al. (2016) find transaction costs are higher for firms with more educational and employment ties to the broader investment community, evidence investors infer a greater likelihood of information leakage via social networks for these firms.

## ***2.2 Form 8-K filings and private communications***

### *2.2.1 Background on Form 8-K filings*

SEC regulations generally require firms to file Form 8-K to timely disclose specific events such as entry into a significant contract or any other material information a "reasonable investor"

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<sup>4</sup> Other studies show a reduction in analyst information advantage in the early post-Reg FD period. Heflin, Subramanyam and Zhang (2003) document a decline in analyst forecast accuracy after Reg FD in the univariate tests although the effect of Reg FD becomes insignificant in the regression analysis. Mohanram and Sunder (2006) find that individual analysts from big brokerage houses (presumably with more privileged access to management) no longer display superior forecasting ability in the four quarters immediately following Reg FD. Gintchel and Markov (2004) and Francis, Nanda, and Wang (2006) also find that the passage of Reg FD is associated with a reduction in selection disclosure to analysts. However, Brown et al. (2015) suggest that analysts have learned to work around Reg FD.

would consider “important in making an investment decision”.<sup>5,6</sup> Reg FD also requires firms to broadly disseminate material information that was selectively disclosed using Form 8-K (or another method that is widely and non-exclusively circulated) within 24 hours of the selective disclosure. Recent research shows that select market participants still participate in privileged communications prior to 8-K filings in the post-Reg FD era (Lerman and Livnat 2010; Goldstein and Wu 2015; Campbell, Twedt and Whipple 2017; Ben-Rephael, Da, Easton and Israelsen 2017).<sup>7</sup> Furthermore, analysts vary in their propensity to revise their earnings forecasts following 8-K filings that do not report the results of operations (Rubin, Segal and Segal 2017). While Rubin et al. (2017) interpret their evidence as indicative of differential analyst ability to quickly interpret the information in unanticipated 8-Ks, the observed differences in analysts’ information processing could also be related to private information arising from selective disclosure. Ultimately, despite the improved timeliness as prescribed in the 2004 SEC guidance and the significant information content of 8-K filings (Lerman and Livnat 2010), the effectiveness of 8-K filings in leveling the information playing field is by no means a foregone conclusion given the evolving nature of selective disclosure in the post-Reg FD era.

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<sup>5</sup> <https://www.sec.gov/investor/pubs/readan8k.pdf>. See Appendix B for detailed background on Form 8-K.

<sup>6</sup> Earlier research on 8-Ks typically uses 8-K filings to identify a specific type of event such as accounting restatements or auditor changes and examines characteristics of firms that report such events (for example, Schwartz and Soo 1996; Whisenant, Sankaraguruswamy, and Raghunandan 2003; Palmrose, Richardson, and Scholz 2004; Ettredge, Johnstone, Stone and Wang 2011). Among earlier studies, Carter and Soo (1999) is the only paper that is interested in 8-K filings in general rather than a specific type of event reported on 8-Ks and they document significant tardiness in filings.

<sup>7</sup> Lerman and Livnat (2010) document significant abnormal stock returns prior to 8-K filings. Ben-Rephael et al. (2017) provide evidence that institutional investors are aware of material events before public disclosure on 8-Ks and they trade against retail investors when 8-Ks are filed. Goldstein and Wu (2015) show that bid-ask spread around 8-K filing dates is larger for firms that take longer to disclose material events on 8-Ks, consistent with higher risk of informed trading for certain firms around 8-K filings. Using intraday trading data, Campbell et al. (2017) find evidence of informed trading during the hour immediately prior to filings of Reg FD-specific 8-Ks.

### 2.2.2 *Impact of 8-K filings on the relation between social connections and analysts' private information*

We investigate the impact of 8-K filings on a key group of financial intermediaries, sell-side analysts, some of whom are likely to benefit from private communications (Koch, Lefanowicz, and Robinson 2013). We conjecture the impact of 8-K filings on analysts is unlikely to be uniform across covered firms given the differences in connection-related private communications to the investment community. If 8-K filings attenuate the relative importance of selective disclosure, we expect the filings to reduce the differences in private information across high- and low-connection firms. However, 8-K filings may not completely erase differences in analysts' private information for several reasons.

First, SEC regulations require firms to simultaneously file Form 8-K to publicly disclose material information selectively disclosed to securities market professionals at broker-hosted investor conferences, analyst days, and non-deal road shows or in individual discussions with analysts to help level the information playing field. However, these Reg FD-specific 8-K filings are unlikely to accompany many private interactions given the latitude in the application of Reg FD.<sup>8</sup>

A significant limitation of Reg FD is the “mosaic” exception, which allows corporate management to disclose a non-material piece of information that can still help some securities market professionals piece together material information. This exception, along with the subjectivity in determining whether information is material allows management some latitude in private communications with the investment community. For example, the SEC states that “some new products or contracts may clearly be material to an issuer; yet that does not mean that all product developments or contracts will be material.” Further, securities market professionals can

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<sup>8</sup> See Appendix B for examples of events disclosed under Item 7.01 “Regulation FD Disclosure”.

extract “information that would not be significant to the ordinary investor to reach material conclusions.”<sup>9</sup> Using vignettes depicting private manager-investor meetings, Soltes (2018) documents the variation within and between managers and regulators in their assessment of whether an interaction constitutes a violation of Reg FD.<sup>10</sup> The latitude in managers’ judgment about materiality raises questions about whether Form 8-K filings are likely to mitigate the effects of selective disclosure or reduce information asymmetry arising from selective disclosures.

Second, 8-K filings could trigger additional private information search as analysts seek to better interpret the information contained in the filings. Soltes’ (2014) evidence that 43 percent of analysts’ private interactions with management occur within 72 hours of public information releases is consistent with this alternative. Lerman and Livnat (2010) also show market reactions are incomplete at the 8-K filings and continue for a period of 30-90 days after the filings. Private information searches will continue for both high- and low-connection firms if analysts covering either type of firms have not completed the “mosaic” of information prior to the filings. Thus, differences in private information across high- and low-connection firms may not dissipate with the filing as additional private communications occur through firms’ connections with the investment community (Brown et al. 2015).

Third, the playing field may not be level if managers are strategic in filing Form 8-Ks. A number of recent studies provide evidence consistent with management making strategic

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<sup>9</sup> Also see <https://www.sec.gov/rules/final/33-7881.htm>.

<sup>10</sup> For example, one vignette describes a situation where in a private meeting with an investor, the CEO discloses to the investor that there have been informal discussions about a takeover offer. While mergers and acquisitions is one area where a much greater consensus on materiality seems likely, Soltes (2018) find that 28% of managers and 24% of regulators believed such a disclosure is not material. This evidence would suggest that private communications that managers deem “immaterial” could take place when a significant corporate event is shaping up and before its eventual disclosure on 8-Ks (especially non-Reg FD-specific 8-Ks). While observing the impact of 8-Ks does not allow us to draw definitive conclusions on whether “immaterial” information about a material event has been previously disclosed, our setting speaks to whether 8-Ks remedy the selective disclosures after we document that selective disclosures exist prior to the filings.

disclosure decisions around 8-K filings. Firms take longer to file 8-Ks when there is a higher level of uncertainty about the events, and they are more likely to file when investor attention is low if 8-Ks contain negative news (Goldstein and Wu 2015; Segal and Segal 2016). Moreover, firms engaged in strategic timing of 8-K filings are also more likely to bundle positive news with negative news items (Segal and Segal 2016). Strategic 8-K filings are consistent with evidence that in the post Reg FD period, managers increased their use of public earnings forecasts to guide analysts' forecasts down (Heflin, Kross, and Suk 2016) and with what one analyst described as management's effort to "paper things up" [with an 8-K] (Brown et al. 2015), thus casting doubt on their effectiveness in leveling the field. Finally, high-connection firms could privately communicate new information, unrelated to the 8-K, under the "mosaic" exception, which neutralizes any leveling effect 8-K filings may have generated.

### **3 Sample Selection and Research Design**

#### ***3.1 Data requirements***

The primary sources of our data include the BoardEx database, Standard & Poor's (S&P) Filing Dates database, and the Institutional Brokers Estimate System (I/B/E/S). We construct firms' connections to the investment community using the education and employment history of company officials (including top executives and board of directors) provided by BoardEx. 8-K filings information including the SEC category (or categories but no more than five categories) of events are from the S&P Filing Dates database (see Appendix B for details). 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). We exclude earnings announcement 8-Ks because the common practice of blackout periods prohibits insider trading and deters the flow of private information before earnings

announcements, but firms typically do not adopt blackout periods for other reportable 8-K events. Additionally, non-earnings-announcement 8-Ks are filed at irregular intervals because 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 revise their forecasts to reflect these events prior to their public disclosure (Rubin et al. 2017). Therefore, we focus primarily on the role of non-earnings-announcement 8-K filings.<sup>11</sup> We also separately test Reg FD-specific 8-Ks (Item 7.01 “Regulation FD Disclosure”) and non-Reg-FD-specific 8-Ks (neither Item 7.01 nor Item 8.01 “Other Events”). We exclude Item 8.01 in either category in our main analysis because the nature of events reported under Item 8.01 is ambiguous. Firms can file a report under Item 8.01 to comply with Reg FD instead of furnishing a report under Item 7.01. However, firms can also use Item 8.01 to report miscellaneous events “that are not specifically called for by Form 8-K”.<sup>12</sup>

Individual analyst forecasts of annual earnings for the fiscal year of the 8-K filings are from the I/B/E/S Detail History file. We require firms to be covered by at least two analysts with sufficient data to calculate measures of analysts’ idiosyncratic information. Finally, we collect financial data from Compustat, stock return data from the Center for Research in Securities Prices (CRSP), and GDP data from the Federal Reserve to construct our control variables. Our sample period extends from 2001 to 2012, which is post-Reg FD and also after BoardEx started collecting data on company personnel. Our initial sample contains 3,222 non-investment firms and 13,543 firm-years with the requisite data.

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<sup>11</sup> Including earnings-announcement 8-K filings in our main analysis does not change our inferences (untabulated).

<sup>12</sup> Our inferences are unchanged under an alternative definition where we include both Item 7.01 and Item 8.01 as Reg FD-specific 8-Ks.

### ***3.2 Measuring firms' connections to the investment community***

We measure firms' connections to the investment community (*Connection*) as the number of unique investment firms to which the non-investment firm's CEO, CFO, or board members have education or employment connections. We limit our focus to the connections of the CEO, CFO, and board of directors because these individuals are likely to possess information about firms' material events sooner than other officers. We do not differentiate between connections through CEOs, CFOs, or directors, or between education and employment connections because we do not have an ex ante expectation as to which type of connection is more important in facilitating information transfer. For example, for a given firm in a given year, its CEO has both educational and work connections to the investment firm Morgan Stanley; its CFO has a work connection to Morgan Stanley; and one of its directors has an educational connection to the investment firm Lehman Brothers. In this case, *Connection* equals two since this company has connections to two unique investment firms: Morgan Stanley and Lehman Brothers. An average non-investment firm in our sample is socially connected with 72 investment firms in a given year (see Appendix C for details). Because BoardEx's coverage increases over time, a non-investment firm's *Connection* can increase over time simply because more investment firms (and their employees) are included in the database.<sup>13</sup> Therefore, we standardize *Connection* each year to have a mean of zero and a standard deviation of one (denoted *Z\_Connection*).

### ***3.3 Measuring analysts' idiosyncratic information***

We rely on the BKLS framework and its empirical implementation in Barron et al. (2002) and Barron et al. (2008) to separate analysts' total information into the common and idiosyncratic

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<sup>13</sup> Untabulated analysis confirms that an average non-investment firm's connection to the investment community increases systematically over the sample period.

components. BKLS uses observable attributes of analysts' forecasts (i.e., analyst forecast dispersion and error) to draw inferences about analysts' unobservable common and idiosyncratic information. Our BKLS measures include *Commonality* and *lnIdiosync*. *Commonality* refers to the proportion of common information relative to total information, and *lnIdiosync* is the natural logarithm of the precision of idiosyncratic information (*Idiosync*). The following equations show how *Commonality* and *Idiosync* are measured:<sup>14</sup>

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

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

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 the absolute value of actual EPS; and *N* is the number of forecasts.

Following Barron et al. (2002), 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). This procedure selects analysts who are actively following the firms that they cover and ensures that the comparison between analysts' information environment before and after the filing is based on the

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<sup>14</sup> We do not adopt the methodology in Sheng and Thevenot (2012) because their GARCH methodology requires a significant time series of non-missing data for each sample firm. Their estimation uses 24 years of firm data, limiting the sample to 128 large firms. As they note, a limitation of the BKLS measure is the effect of unexpected events on ex-post accuracy. Although the 8-K filing may include information unexpected by some analysts, we expect other subsequent events to have a similar effect on pre- and post-8K BKLS measures. Moreover, unexpected events, such as the 9/11 attacks illustrated in Sheng and Thevenot (2012) are unlikely to differentially affect high- and low-connection firms.



same set of individual analysts.<sup>15</sup> The 45-day window also allows a reasonable amount of time for private communications to occur via 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 analysts' private information around the 8-K disclosure.

A limitation of using the BKLS framework is the validity of the simplifying assumption that analysts covering the same firm observe two sets of information about future earnings – one public or common across all analysts and one idiosyncratic or uniquely private to an individual analyst. However, Barron et al. (2002) show that the simplifying assumption in BKLS is not particularly limiting.<sup>16</sup> Additionally, if analysts learn from prior forecasts we may overestimate the amount of common information. Following Barron et al. (2002) we limit our sample to active analysts to mitigate this concern.

### ***3.4 Matched sample construction***

One challenge we face in estimating the effect of connections on analysts' idiosyncratic information is that our measure of connections may capture firms' information environment (unrelated to selective disclosure). Prior research frequently uses firm size as a proxy of information environment (e.g., Collins, Kothari and Rayburn 1987). Thus, we use a matched-sample based on firm size to rule out the possibility that better information environment drives differences in idiosyncratic information for analysts.<sup>17</sup> To construct the matched sample, we start

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<sup>15</sup> Our results are qualitatively similar when we retain individual analysts who do not update their forecasts within 30 days after the filing but confirm within 30 days that their forecasts prior to the filing are still accurate.

<sup>16</sup> Barron et al. (2002) show that their findings in the full sample are identical to results using a restrictive sample of firms with only two analysts where any non-common information must be completely private to only one of the two analysts. Firms in our matched sample are covered by more than two analysts, preventing us from running a similar test.

<sup>17</sup> We view connections as a firm attribute that explains cross-sectional differences in analyst behavior. We match on firm size to control for the first-order driver of differences in connections. Pearson correlation between firm *Size* and *Z\_Connection* is 60%. In addition, *Size* explains a significant amount of variation in *Z\_Connection* - when we regress *Z\_Connection* on *Size*, the  $R^2$  is 32%.

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 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 of *Z\_Connection* to the firm-year from the high tercile of *Z\_Connection* with the closest firm size. For each pair, we calculate the absolute percentage difference in firm size and remove the pairs at and above the 99<sup>th</sup> percentile of this difference to allow for better matching between high- and low-connection firms.<sup>18</sup> We retain 4,481 pairs of firm-years which include 4,481 unique firm-years from the low *Connection* tercile and 1,526 unique firm-years from the high *Connection* tercile.<sup>19</sup> Our matched sample for the regressions includes 26,208 non-earnings-announcement 8-K filing dates pooled across high- and low-connection firms.

### **3.5 Regression specification**

We investigate whether 8-K filings alter the relation between covered firms' connections to the investment community and cross-firm differences in analysts' idiosyncratic information. The BKLS framework is silent on how idiosyncratic information is obtained and it is possible that analysts' idiosyncratic information reflects their individual research effort unrelated to selective disclosure. However, we do not expect a systematic association between firms' educational and employment connections and analysts' idiosyncratic information in the absence of selective disclosure because analysts' ability to do research should be independent of covered firms' connections. If 8-K filings attenuate the relative importance of selective disclosure, we expect the

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<sup>18</sup> The 99<sup>th</sup> percentile of the absolute percentage difference in firm size is 19.80%, which means that the high-connection firm is 19.80% larger than the low-connection firm for the matched pair at the 99<sup>th</sup> percentile.

<sup>19</sup> When we pool all low- and high-connection firm-years and use the group as a whole in the regression analysis, high-connection firm-year observations are used multiple times in the regression to reflect that they are selected as a match multiple times (Stuart 2010).

filings to reduce the difference in the amount and precision of idiosyncratic information across high- and low-connection firms. We test this conjecture using the following equation:

$$BKLS_{pre}, BKLS_{post} = \beta_0 + \beta_1 \times Z\_Connection + \sum_{k=2}^K \beta_k Control + \varepsilon \quad (2)$$

Our BKLS measures are *Commonality* and *lnIdiosync*. *Commonality* and *lnIdiosync* measured in the pre-filing (post-filing) period are labeled with subscript <sub>pre</sub> (subscript <sub>post</sub>). A negative (positive) association between *Z\_Connection* and *Commonality*<sub>pre</sub> (*lnIdiosync*<sub>pre</sub>) indicates that the proportion (precision) of analysts' idiosyncratic information is higher for highly-connected firms prior to 8-K filings.<sup>20</sup> If the likelihood of selective disclosure is greater for high-connection firms, it will likely manifest as greater and/or more precise idiosyncratic information among analysts covering high-connection firms relative to low-connection firms. Alternatively, if less informed analysts covering high-connection firms learn from their better-informed peers, we expect more common information for high-connection firms. Ex ante, it is unclear whether selective disclosure prior to 8-K filings will result in more common or more idiosyncratic information. Our tests provide empirical evidence to help answer this question.

Our main test is whether the coefficients on *Z\_Connection* in the pre- and post-filing periods are significantly different from each other. A significant difference indicates that 8-K filings alter the link between connections and analysts' idiosyncratic information. Estimating the relation between *Z\_Connection* and *Commonality* or *lnIdiosync* in the pre- and post-filing periods separately documents selective disclosure prior to the filings and provides evidence on the impact of the 8-K filing. We confirm our inferences using the changes in *Commonality* and *lnIdiosync* from the pre-filing to the post-filing period as the dependent variable.

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<sup>20</sup> Since we standardize connections every year, the coefficient on *Z\_Connection* measures the effect of a one-standard-deviation change in the level of connection relative to other firms in the same year.

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 in both regressions. Firm size (natural logarithm of total sales, *Size*), performance (return on assets, *ROA*), growth opportunities (market-to-book ratio, *MTB*), and analyst following (natural logarithm of number of analysts following the firm, *lnAnalyst*) 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 Stain 2000; Zhang 2006). We control for *Leverage* and *Loss* since leverage adds to the volatility of earnings and loss firms are more difficult 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 filings. We include the quarterly change in the gross domestic product ratio (*GDPR*) to control for macroeconomic effects. We also control for how close the 8-K filing is to the earnings announcement date for the fiscal year (*Horizon*). Form 8-Ks filed earlier in the year are likely to introduce more uncertainty than those filed later in the year when it is closer to the announcement of annual earnings. *Horizon* also approximates the horizon of analyst forecasts. For all regressions, we also include year and industry (two-digit SIC code) fixed effects and cluster the standard errors at the firm level.

## **4 Empirical Results**

### ***4.1 Descriptive statistics for Connection and 8-K filings***

Table 1 Panel A compares 8-K filings for 3,222 non-investment firms (13,543 firm-years) in our full sample. We partition firms into groups with low, medium or high levels of connections based on the tercile rankings of their *Z\_Connection* every year. The average low-connection firm in this sample has 30 connections, compared to 67 for a medium-connection firm and 119 for a

high-connection firm. High-connection firms are clearly larger compared to low-connection firms given the significant *Size* difference between them. Panel A also shows that high-connection firms file a higher number of 8-Ks as well as a higher number of Item 7.01 Regulation FD Disclosure or Item 8.01 Other Events per year compared to low-connection firms.<sup>21</sup> 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. We do not draw conclusions on the disclosure of non-material “mosaic” information from 8-K filing patterns since this type of disclosure is not directly observable. In addition, high-connection firms are significantly different from low-connection firms in several ways including *Size*, return on assets (*ROA*), market-to-book ratio (*MTB*), *Leverage*, *Loss*, and analyst coverage (*lnAnalyst*).

Table 1 Panel B reports descriptive statistics for the matched sample. The average *Size* of low-connection firms is not significantly different from the average *Size* of high-connection firms. This suggests that our matching procedure is successful in finding high-connection firms that are similar in size to low-connection firms and that our matched sample is comparable to the population from which it is drawn. Similar to Panel A, high-connection firms still file more 8-Ks and more 8-Ks under either Item 7.01 or Item 8.01 compared to low-connection firms that are similar in size, indicating that the difference in the 8-K filing behavior between high- and low-connection firms is not driven by firm size. After the matching procedure, high- and low-connection firms are still different in *ROA*, *MTB* and *lnAnalyst*. In our regression analyses, we include *Size*, *ROA*, *MTB*, *Leverage*, *Loss*, and *lnAnalyst* to control for differences in firm characteristics that are not eliminated by the matching procedure.

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<sup>21</sup> 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 includes press releases or presentation to select investor groups at events such as investor conferences or road shows.

## 4.2 Univariate comparison

Table 2 Panel A presents descriptive statistics for variables used in our regressions. Overall, the properties of BKLS 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 69.4% (88.2%) before the 8-K filings, and then drops significantly to 66.4% (84.9%) after the 8-K filings. Barron et al. (2002) also observe a decline in *Commonality* around earnings announcements. They conjecture the decline is due to the announcements triggering significant private information discovery, which exceeds the amount of common information released by the announcements. The precision of private information (*InIdiosync*) increases from the pre-filing to the post-filing period, suggesting that public disclosure of material events improves the information quality in analyst forecasts.<sup>22</sup>

Panel B of Table 2 compares the analyst information environment across high- and low-connection firms. This univariate comparison shows that the average proportion of common information (*Commonality*) before the 8-K filing is 71.1% for low-connection firms, compared to 67.8% for high-connection firms. The average precision of idiosyncratic information (*InIdiosync*) for low-connection firms is about ten percent smaller than for high-connection firms in the pre-filing period (1.950 versus 2.148). In the post-filing period, the average precision of idiosyncratic information increases for both groups but the difference decreases (2.367 for low-connection firms and 2.474 for high-connection firms). These 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.<sup>23</sup> Taken together, the

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<sup>22</sup> *Idiosync* is highly skewed to the right (untabulated), thus we use the natural logarithm of *Idiosync* (*InIdiosync*) in our subsequent analysis.

<sup>23</sup> Correlation coefficients (untabulated) between *Z\_Connection* and BKLS measures reveal similar pattern. We have also tested for multicollinearity and no variance inflation factors (VIF) are greater than 10.

univariate analysis suggests that 8-K filings reduce, but do not eliminate the differences in analysts' idiosyncratic information that vary across covered firms' connections.

### 4.3 *Multivariate regression results*

Table 3 presents the regression results on the association between connections and the BKLS measures including the proportion of common information (*Commonality*) and the precision of idiosyncratic information (*lnIdiosync*). For all 8-Ks in Panel A, results for *Commonality* and *lnIdiosync* show that in the pre-filing period, connections reduce the relative amount of common information ( $Z\_Connection = -1.613, t = 2.35$ ) and increase the precision of private information contained in analyst forecasts ( $Z\_Connection = 0.106, t = 2.32$ ). In the post-filing period,  $Z\_Connection$  is not significantly related to either *Commonality* ( $Z\_Connection = -0.153, t = 0.23$ ) or *lnIdiosync* ( $Z\_Connection = 0.045, t = 0.99$ ).

A Wald chi-square test shows a significant difference between the coefficients on  $Z\_Connection$  in the pre- and post-filing periods for either BKLS measures. High-connection firms no longer have lower levels of *Commonality* ( $\chi^2$ -stat = 8.78, p-value = 0.01) and more precise idiosyncratic information ( $\chi^2$ -stat = 4.80, p-value = 0.05 for *lnIdiosync*) after the 8-K filings. This is consistent with 8-K filings attenuating the privileged communication that trickles down to analysts when they cover highly-connected firms.

The association between control variables and the proportion of common information and precision of private information are generally consistent with our expectations. Firm performance (*ROA, Loss*) and the forecast horizon are positively related to the proportion of common information in analyst forecasts and negatively related to the precision of idiosyncratic information. The information content of 8-K filings (*absCAR*) is also positively associated with the proportion of common information before the 8-K filings, but not after and negatively related to the precision

of idiosyncratic information both before and after the 8-K filings. The number of analysts covering the firm is negatively related to the proportion of common information in analyst forecasts and positively related to the precision of idiosyncratic information.<sup>24</sup>

In an alternative specification, we confirm our inferences using  $\Delta Commonality$  or  $\Delta lnIdiosync$  as the dependent variable. Results reported in Panel A show a positive association between  $Z\_Connection$  and  $\Delta Commonality$ . Since  $\Delta Commonality$  and change in the proportion of idiosyncratic information are in the opposite direction, this result indicates low-connection firms experience a greater increase in the proportion of idiosyncratic information. Similarly, we find that low-connection firms experience a greater increase in the precision of idiosyncratic information ( $\Delta lnIdiosync$ ) around 8-K filings.

In Table 3 Panel B, results for Reg FD-specific 8-Ks are similar to those for all 8-Ks in Panel A. Connections are significantly associated with *Commonality* and *lnIdiosync* during the pre-filing period but not during the post-filing period, and the differences between the coefficients on  $Z\_Connection$  in the pre- and post-filing periods are all significant at the 1% level.<sup>25</sup> For non-Reg FD-specific 8-Ks in Panel C, 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. 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. More importantly, there are no significant differences in the

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<sup>24</sup> To address the concern that higher-quality analysts are concentrated in high-connection industries, we drop the three or five Fama French 48 industries (Fama and French 1997) with the highest levels of connections to the investment community and re-run our analyses, our inferences are similar in both reduced samples. The top five industries with most connections to investment community include Smoke Tobacco Product, Insurance, Beer and Liquor, Household Consumer Goods, and Candy and Soda.

<sup>25</sup> When we include both Item 7.01 and Item 8.01 as an alternative definition of Reg FD-specific 8-Ks, we find that  $Z\_Connection$  is still negatively (positively) associated with *Commonality* (*lnIdiosync*) in the pre-filing period at the significance level of 10% and this association becomes insignificantly different from zero in the post-filing period (untabulated).



coefficients on  $Z\_Connection$  between the pre- and post-filing periods. Additional Chi-square tests (untabulated) indicate the change in the coefficients on  $Z\_Connection$  from the pre- to the post-filing period in Reg FD-specific regressions (Panel B) is significantly different from the change in non-Reg FD-specific regressions (Panel C), consistent with stronger effects of Reg FD-specific 8-Ks.<sup>26</sup>

In sum, Panel B and Panel C show that connections are associated with more and more precise idiosyncratic information prior to both Reg FD-specific and non-Reg FD related 8-K filings. However, the impact of 8-Ks on changes in the proportion and the precision of idiosyncratic information is concentrated in Reg FD-specific 8-Ks. While Reg FD-specific 8-Ks mitigate pre-8-K differences in information for analysts of high- versus low-connection firms, the mosaic exception appears to allow significant differences in the amount and precision of idiosyncratic information to persist. Alternatively, Segal and Segal (2016) characterize Reg FD disclosures as more voluntary, suggesting voluntary disclosures may be more effective at leveling the playing field than mandatory 8-K filings.

#### ***4.4 Selective disclosure or better public information?***

We use three additional tests to corroborate our inference that pre 8-K filings differences arise from selective disclosure rather than cross-sectional differences in firms' information environments. First, we examine the association between connections and the quality of analysts' common information. If higher connections reflect better public information (rather than likelihood of selective disclosure), we expect  $Z\_Connection$  to be positively associated with the

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<sup>26</sup> While we analyze Reg FD-specific and non-Reg FD-specific filings separately, non-Reg FD-specific 8-Ks still include many different types of events which may trigger differential reactions from analysts. In an untabulated robustness test we include Form 8-K item fixed effects based on the categories of events described in Appendix B and rerun our Table 3 Panel A analysis. Results (untabulated) show that our findings are robust to the inclusion of 8-K item fixed effects.

precision of common information ( $\ln Common$ ).<sup>27</sup> Untabulated regression results show no statistically significant association between  $Z\_Connection$  and  $\ln Common$  during either pre- or post-filing periods regardless of the type of 8-Ks, which suggests that connections do not simply proxy for other firm attributes that indicate better public disclosures.<sup>28</sup> Additional untabulated results show that high-connection firms do not file more informative 8-Ks. We use absolute abnormal returns ( $absCAR$ ) measured over the three-day window around 8-K as a proxy for the new information in the 8-K. We find  $absCAR$  is lower for high-connection firms compared to low-connection firms which is consistent with higher likelihood of pre-filing information flow from corporate management to the investment community for high-connection firms. Because our tests of the proportion of common and idiosyncratic information indicate high-connection firms have relatively less common information, we conclude the lower  $absCAR$  is not attributable to broad early dissemination of information in the 8-K.

Finally, we examine investors' perception on the likelihood of selective disclosure around 8-K filings. Research finds bid-ask spreads are higher for firms with more connections to the investment community, consistent with concerns about informed trading due to selective disclosure (Cai et al. 2016). We compare the bid-ask spreads around the 8-K filings of high- and low-connection firms. Using CRSP daily bid-ask data, we construct a standardized bid-ask spread (using mean and standard deviation of bid-ask spread for the fiscal year) and calculate the averages

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<sup>27</sup>  $\ln Common$  is the natural logarithm of the precision of common information ( $Common$ ), where  $Common$  is calculated as  $\frac{(SE - \frac{D}{N})}{[(SE - \frac{D}{N}) + D]}$ . Following BKLS, we set negative value of  $Common$  to zero. We add one to  $Common$

before log-transformation to keep observations where  $Common$  is equal to zero.

<sup>28</sup> Untabulated results also show that the precision of common information or total information (sum of common and idiosyncratic information) increases from the pre-filing to the post-filing period. While this evidence is consistent with 8-K filings improving the information quality in general, our interest is whether 8-K filings alter the relation between social connection and analysts' private information.

for the pre-filing and post-filing BKLS windows ( $Z\_Spread_{pre}$  and  $Z\_Spread_{post}$ ) as well as the changes around the filings ( $\Delta Z\_Spread$ ).

Univariate statistics reported in Table 4 show that the pre-filing bid-ask spread ( $Z\_Spread_{pre}$ ) is higher for high-connection firms, consistent with the market participants' heightened concerns about connection-facilitated informed trading before the 8-K filings. After the 8-K filings bid-ask spreads decrease for both high- and low-connection firms (i.e.,  $\Delta Z\_Spread$  is negative). However, the decrease for high-connection firms is larger, consistent with 8-K filings mitigating market participants' concerns about connection-facilitated informed trading.

## **5 Additional Analysis and Robustness Checks**

### ***5.1 Cyclical and analysts' idiosyncratic information***

Hutton, Lee, and Shu (2012) predict and find that analyst earnings forecasts are more accurate than management earnings forecasts when analysts cover firms whose earnings are either highly cyclical or highly counter cyclical. This result suggests that the relation we find between firms' connections and analysts' idiosyncratic information should be stronger for analysts covering less cyclical firms where firm-specific selective disclosure is more beneficial. To examine this possibility, we rerun our analyses after partitioning the sample based on industry-level cyclicity and tabulate the results in Table 5. Using the average level of *Cyclicity* in Appendix B of Hutton et al. (2012), we define highly cyclical industries as the ten industries with the highest mean *Cyclicity* including Aircraft, Banking, Electronic Equipment, Construction, Electrical Equipment, Fabricated Products, Defense, Health Care, Shipbuilding and Railroad, and Steel Works. The remaining industries are less cyclical industries where idiosyncratic firm-specific information is more likely to benefit analysts.

Results in Table 5 show that our main findings are concentrated in less cyclical industries. For firms in less cyclical industries, analysts covering highly-connected firms have a higher proportion of private information and more precise private information prior to 8-K filings. After 8-K filings, the precision of their private information is still higher even though they no longer have a higher proportion of private information.

For firms in highly cyclical industries, we do not have *ex ante* expectations on how firms' connections help improve analysts' private information given that analysts already do a better job forecasting firms' earnings than managers when *Cyclical* is high. Table 5 shows that for highly cyclical firms, *Z\_Connection* is not associated with the proportion/precision of idiosyncratic information before 8-K filings. While 8-K filings change the relation between *Z\_Connection* and *Commonality* in highly cyclical industries, they do not alter the relation between *Z\_Connection* and *InIdiosync*. Thus, information transfer from managers of highly cyclical firms to the investment community does not help analysts improve their private information either before or after 8-K filings.

We also use firm stock return's comovement with the industry and market stock returns as an alternative measure of macroeconomic factors' impact on individual firms' performance.<sup>29</sup> Untabulated results show the findings for high-comovement relative to low-comovement industries are similar to the subsample analysis based on *Cyclical* from Hutton et al. (2012).

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<sup>29</sup> Following prior literature (e.g., Morck, Yeung and Yu 2000; Piotroski and Roulstone 2004), we regress individual firms' monthly stock returns on monthly industry (based on two-digit SIC) and market returns for each industry-year and use the explained variation ( $R^2$ ) as a measure of comovement. The industry-year level  $R^2$  ranges from 0.35% to 63.43% with mean of 17.03% and standard deviation of 10.01%. We define those with  $R^2$  greater than 40 percent as high-comovement industries.

## 5.2 Impact of 8-K filings – corroborating evidence

In this section, we conduct additional analyses to corroborate our main inferences. If an individual analyst at a high-connection firm is more likely to receive privileged communication in advance, statistically this will affect the *average* response of analysts covering a high-connection firm relative to a low-connection firm, which allows us to conduct firm-level analysis to corroborate the BKLS findings. Thus, we first investigate whether analysts' average response to 8-K filings varies with firms' connections to the investment community. If Form 8-K filings make selectively disclosed information public, they likely provide the earliest opportunity for analysts covering low-connection firms to incorporate information about the reportable events into their earnings forecasts. If so, analysts covering low-connection firms (and a higher fraction of them) will revise their earnings forecasts more quickly than analysts covering high-connection firms after 8-K filings. At the same time, the magnitude of forecast revisions around 8-Ks filed by low-connection firms is likely to be larger compared to forecast revisions around 8-Ks filed by high-connection firms.

Similar to Kross and Suk (2012), we examine the speed, incidence, and magnitude of analysts' forecast revisions (*Delay*, *Fraction* and *Revision*). We measure *Delay* as the average number of days it takes for individual analysts covering each firm to revise their earnings forecasts after the 8-K filing date, divided by the number of days between the 8-K filing date and the upcoming annual earnings announcement date. *Fraction* measures the fraction of analysts who revise their earnings forecasts within five days after the 8-K filing date. Finally, *Revision* is the absolute value of the difference between the post-filing and pre-filing median forecasts, scaled by stock price at the beginning of the fiscal year. A positive association between *Z\_Connection* and

*Delay* and a negative relation between *Z\_Connection* and *Fraction* or *Revision* are each consistent with analysts covering less-connected firms relying more on information in 8-Ks.

Table 6 presents the results on the association between connections and the speed, incidence and magnitude of analysts' forecast revisions after 8-K filings. Panel A shows that the average *Delay* in analysts' response to 8-K filings is 14.1 percent of the days between the 8-K filing and earnings announcement. On average, 14.4 percent of analysts with pre-8-K forecasts outstanding revise their forecasts within 5 days after the filings (*Fraction*). The average forecast revision scaled by beginning-of-the-year stock price (*Revision*) is 0.022. Panel B shows that low-connection firms have a shorter *Delay* before post 8-K forecast revisions, a larger *Fraction* of analysts revise within five days, and the magnitude of the *Revision* is larger compared to high-connection firms.

Regression results in Panel C show that *Z\_Connection* is negatively associated with the magnitude of analyst forecast revisions (*Revision*) and positively associated with the *Delay* in forecast revisions.<sup>30</sup> The fraction of analysts who revise within five days after 8-K filings (*Fraction*) is not significantly associated with *Z\_Connection*. These findings imply that analysts covering high-connection firms rely less on public disclosures in 8-Ks and they do not react to information in 8-K filings as much as analysts covering low-connection firms, consistent with a higher likelihood of selective disclosure prior to the 8-K filing. In untabulated analysis, we examine the number of calendar days between material events and 8-K filings for high- and low-connection firms. We find on average low-connection firms wait 2.6 days to file 8-Ks versus 2.31 days for high-connection firms. This difference in filings speed is economically small, but statistically significant. This evidence is contrary to what would be expected if managers of high-connection

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<sup>30</sup> These results are also robust to the inclusion of Form 8-K item fixed effects (untabulated).

firms deliberately delay the filing of 8-Ks while selectively disclosing the information. Rather, the evidence is consistent with managers of high-connection firms filing sooner, possibly to comply with the 24-hour requirement in Reg FD and “paper things up”.

Controls for the firm information environment are generally related to *Delay*, *Fraction*, and *Revision* in the expected directions. Better firm performance (*ROA*) and greater information content of 8-K filings (*absCAR*) are associated with shorter delays in revision time, a higher fraction of analysts revising their forecasts and larger forecast revisions. For firms with extreme poor performance (*Loss*), a smaller fraction of analysts revise and the absolute magnitude of their forecast revisions is larger.

Second, we conduct two complementary tests for a subsample of individual analysts who cover both high- and low-connection firms to provide additional evidence. Requiring that an individual analyst covers both high- and low-connection firms also helps rule out the possibility that differences in analyst characteristics across covered firms rather than analysts’ private information are driving the results. In test one, we reassess the average response of analysts to 8-K filings (*Delay*, *Fraction*, and *Revision*) for this subset of individual analysts. Results in Table 7 Panel A show that consistent with our findings above, low-connection firms have a shorter *Delay* revising forecasts after 8-Ks are filed. However, *Z\_Connection* is not statistically associated with *Fraction* and *Revision* for this subset of individual analysts.

In test two, we assess the reaction of analysts to 8-Ks at the individual analyst level. While we cannot isolate the private information component from forecasts of one single analyst, we examine whether forecast revisions for high-and low-connection firms differ within analyst (i.e., we hold the individual analyst constant). Using the full sample of analyst-firm observations, we calculate the number of days between 8-K filing and the issuance of an individual analyst’s forecast

after the filing (*Days*). We then calculate the pre-filing (post-filing) forecast error for each individual analyst as her pre-filing forecast minus the I/B/E/S-reported actual EPS. Following Jacob, Lys and Neale (1999), we measure relative accuracy before (*RelAccuracy<sub>pre</sub>*) or after the 8-K filing (*RelAccuracy<sub>post</sub>*) as an individual analyst's absolute forecast error divided by the average absolute forecast error of all individual analysts covering the same firm. Relative accuracy implicitly controls for characteristics of the covered firm or inter-temporal variations that may be associated with differences in analyst forecast accuracy that are unrelated to connections.

Next, we compute separate averages, by analysts, for low- and high-connection firms for the subset of analysts who cover both high- and low-connection firms in a given year. This approach allows the likelihood of selective disclosures to vary across different levels of firm *Connection* for the same analyst. Table 7 Panel B presents the mean and median of the analyst-year averages for *Days* and *RelAccuracy* for high- and low-connection firms along with paired difference test. Results show that it takes fewer days for an analyst to revise her forecasts after 8-K filings when she covers low-connection firms, consistent with test one.<sup>31</sup> Analysts' forecasts for high-connection firms are more accurate (smaller values of *RelAccuracy*) than their forecasts for low-connection firms before but not after 8-Ks are filed. These results are largely consistent with inferences from Table 6 and Table 7 Panel A that analysts covering less connected firms are less likely to have selectively disclosed information prior to the 8-K filing.

When we conduct secondary univariate comparisons (untabulated) with the added constraint on matching the type of 8-Ks (i.e., Reg FD-specific and non-Reg FD-specific filings),

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<sup>31</sup> Paired difference test also shows that forecasts for high-connection firms are issued earlier relative to the 8-K than forecasts for low-connections firms (untabulated). Untabulated frequency distribution shows that among all analysts with a forecast either before or after the filing, 86.6% of those covering high-connection firms issue a forecast prior to 8-K filings, significantly different from 83.9% among analysts who cover low-connection firms. This is consistent with a higher probability of releasing a forecast in the pre-filing period when analysts cover high-connection firms.



we find that it takes fewer *Days* for an analyst to revise her forecasts after either Reg FD-specific or non-Reg FD-specific 8-K filings when she covers low-connection firms. However, we do not have statistical significance when we compare the relative accuracy (*RelAccuracy*) of analysts' forecasts across high- and low-connection firms around 8-K filings (except for the mean value of *RelAccuracy<sub>pre</sub>* within the subsample of non-Reg FD-specific 8-K filings where there is marginal significance at the 10% level).

### **5.3 Robustness checks**

#### *Alternative measures of firms' connections*

We construct various alternative measures of firms' connections to the investment community and rerun our main analysis (untabulated). Our first measure is the sum of unique education or employment connections to the investment community across the non-investment firm's CEO, CFO, and board members. Because sociology studies (e.g., Fischer, 1982) show that the tendency of individuals to bond with others becomes stronger as more types of relationship exist between two people, this measure is indicative of both the strength and the number of connections. Second, we count the number of a non-investment firm's CEO, CFO, and board members that have connections to the investment firms because each connected individual represents a unique source of information transfer (Cai et al. 2016). Third, we require individuals to graduate in the same year to qualify as having an education connection and recalculate the number of unique investment firms.<sup>32</sup> Finally, we observe that the most connected title at investment firms is "Independent Director." Since independent directors of investment firms are relatively removed from the daily operations of analysts, we reconstruct our connection measure

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<sup>32</sup> The effects of this recalculated measure do not differ from those of the original measure, consistent with Cai et al. (2016) that show no significant difference between the effects of past and current social ties on firms' trading costs.

after dropping the independent directors of investment firms. Results using these alternative measures are largely consistent with our main findings.

#### *New 8-K filing rules in 2004*

Since the new 8-K filing rules took effect in 2004, we test whether the relation between connections and analysts' idiosyncratic information changes after 2004 by interacting a *Post\_2004* indicator variable with *Z\_Connection*. Untabulated results show the interactions between *Post\_2004* and *Z\_Connection* are not significantly different from zero, therefore new 8-K filing rules implemented in 2004 do not significantly alter the relation between connections and analysts' idiosyncratic information.

#### *Local information networks*

We rely on educational or employment connections to infer private communications. However, it is possible that our measure of connections captures some of the private communications through local information networks (O'Brien and Tan 2015). Although this possibility does not affect our tests on the effectiveness of 8-Ks in reducing idiosyncratic information from private communications, we check the robustness of our results after controlling for local information networks. Since investment firms are more likely to be located in large metropolitan areas and money centers, we construct a variable that indicates whether the non-investment firm is headquartered in money centers defined by Bushee, Jung and Miller (2011). Our results (untabulated) are robust to adding this indicator as an additional control variable.

## **6 Conclusion**

We investigate whether Form 8-K disclosures mitigate the impact of selective disclosure to analysts in the post-Reg FD era. We rely on firms' connections to the investment community to infer the likelihood of selective disclosure and implement the BKLS framework to isolate the

idiosyncratic component of analysts' information. We first show that analysts who cover highly-connected firms have a higher proportion of idiosyncratic information and more precise idiosyncratic information prior to 8-K filings. After 8-K filings, the proportion and precision of idiosyncratic information for high-connection and low-connection firms are the same. Further analyses reveal that the impact of 8-K filings varies in predictable ways with the type of 8-K. Public disclosures in Reg FD-specific 8-Ks attenuate the association between connections and analysts' idiosyncratic information. However, filings of non-Reg FD-specific 8-Ks do not reduce the difference in idiosyncratic information.

Our results extend the growing body of evidence selective disclosure continues to occur post Reg FD and confirm the link between selective disclosure and analysts' private information search. Our evidence suggests Reg FD-specific 8-Ks may disseminate information more broadly, but only after selective disclosure has occurred. Nevertheless, privileged communications will remain undisclosed if regulators do not mandate 8-K filings.

## APPENDIX A. Variable Definitions

Variable	Definition
<i>absCAR</i>	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.
<i>lnAnalyst</i>	Natural logarithm of number of analysts following the firm.
<i>Commonality</i>	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.
<i>Connection</i>	Total number of investment firms with which a public firm has education or employment connections.
<i>Days</i>	The number of days between 8-K filing date and the date of the most recent individual analyst forecast issued after the filing.
<i>Delay</i>	The average number of days between 8-K filing date and subsequent individual analyst forecast revisions, divided by the number of days between the 8-K filing date and the following earnings announcement date.
<i>Fraction</i>	The number of analysts who revise their earnings forecasts within five days after the 8-K filing date, divided by the number of analysts following the firm in the current quarter.
<i>GDPGR</i>	Quarterly change in the seasonal growth rate in gross domestic product (GDP). Obtained from Federal Reserve website: <a href="http://research.stlouisfed.org/fred2/series/GDP/downloaddata?cid=106">http://research.stlouisfed.org/fred2/series/GDP/downloaddata?cid=106</a> .
<i>Horizon</i>	The number of days between the 8-K filing date and earnings announcement date, scaled by 365.
<i>Leverage</i>	Total liabilities scaled by total assets at the beginning of the fiscal year.
<i>lnCommon</i>	Natural logarithm of (Common+1). Common is 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. Negative value of Common is set to zero.
<i>lnIdiosync</i>	Natural logarithm of (Idiosync+1). Idiosync is 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.
<i>Loss</i>	An indicator variable which equals one if the firm incurs a loss during that year, and zero otherwise.
<i>MTB</i>	Ratio of market value of common equity to book value at the beginning of the fiscal year.

<i>Num_701</i>	The number of 8-Ks filed under Item 7.01 (Regulation Fair Disclosure) by a given firm in a given fiscal year.
<i>Num_801</i>	The number of 8-Ks filed under Item 8.01 (Other Events) by a given firm in a given fiscal year.
<i>Num_8K</i>	The number of 8-Ks filed by a given firm in a given fiscal year.
<i>RelAccuracy</i>	An individual analyst's absolute forecast error divided by the average absolute forecast error of all analysts covering the same firm before or after the 8-K filing, where forecast error is defined as the difference between individual analyst forecast of annual EPS and actual EPS.
<i>Revision</i>	Absolute value of the difference between median analyst forecasts during pre-filing and post-filing periods, scaled by the stock price at the beginning of the fiscal year.
<i>ROA</i>	Earnings before extraordinary items scaled by lagged total assets.
<i>Size</i>	Natural logarithm of total sales for the firm during the year.
<i>Z_Connection</i>	Connection standardized every year to have mean zero and standard deviation of one.
<i>Z_Spread</i>	Standardized daily bid-ask spread (standardized using the mean and standard deviation of bid-ask spread for the fiscal year) averaged over 45 days before or 30 days after a non-earnings 8-K filing.

## 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 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,” Rule 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)”. For 8-Ks filed before August 23, 2004, we map reportable events into the new SEC categories. The following table shows the categories under the new numbering system as well as mapping of the old numbering system into the new one.

### B1. All Form 8-K categories

Current Item Number	Item Description	Previous Item Number
<b><i>Section 1</i></b>		
<b><i>Registrant's Business and Operations</i></b>		
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	-
<b><i>Section 2</i></b>		
<b><i>Financial Information</i></b>		
Item 2.01	Completion of Acquisition or Disposition of Assets	Item 2
Item 2.02	Results of Operations and Financial Condition	Item 12 <sup>(a)</sup>
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	-

<b>Section 3</b>		<b>Securities and Trading Markets</b>	
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	-	
<b>Section 4</b>		<b>Matters Related to Accountants and Financial Statements</b>	
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	-	
<b>Section 5</b>		<b>Corporate Governance and Management</b>	
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 <sup>(a)</sup>
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	-	
<b>Section 6</b>		<b>Asset-Backed Securities</b>	
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	-	
<b>Section 7</b>		<b>Regulation FD</b>	
Item 7.01	Regulation FD Disclosure		Item 9 <sup>(b)</sup>
<b>Section 8</b>		<b>Other Events</b>	
Item 8.01	Other Events		Item 5
<b>Section 9</b>		<b>Financial Statements and Exhibits</b>	
Item 9.01	Financial Statements and Exhibits		Item 7

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(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 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 2000 and before the new 8-K rules became effective in August 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).

## **B2. Reg-FD specific filings – Item 7.01**

Item 7.01 on Form 8-K filings provides one channel for companies to disclose the incidence of private communications with the investment community and inform the public of the content of these communications. Management presentations to the investment community are among the most common Reg FD filings and are generally attached as exhibits in the 8-K. For example, on September 1, 2006, Southwestern Energy Co disclosed that Harold M. Korell, President and Chief Executive Officer of the Company will be making a presentation to investors at the 2006 Lehman Brothers CEO Energy Conference. In the 8-K filing, the company stated:

*The presentation will include year-to-date operating information relating to the Fayetteville Shale play and updated guidance regarding the Company's projected net income, operating income, earnings per share, net cash provided by operating activities before changes in operating assets and liabilities ("Net Cash Flow") and earnings before income taxes, depreciation, depletion and amortization ("EBITDA") for fiscal year 2006. Net Cash Flow and EBITDA are non-GAAP measures that are reconciled on pages 31 and 32 of the presentation. A copy of the presentation is furnished herewith as Exhibit 99.1.*

We provide below additional excerpts and examples.

- United Continental Holdings, Inc., October 12, 2011 – Gerald Laderman, Senior Vice President Finance and Treasurer of United Continental Holdings, Inc. "*will speak at the Deutsche Bank 2011 Leveraged Finance Conference*".
- IHS Inc., October 12, 2007 – The company "*held its second annual Investor Day conference in New York City*".



- Atwood Oceanics Inc., on June 24, 2009 – *“the Company’s President and CEO, John Irwin and CFO, Jim Holland, participated in Wachovia’s 19<sup>th</sup> Annual Mid-Year Equity Conference”*.
- Comerica Incorporated, February 7, 2011 – The company *“posted an investor presentation to its website” and “From time to time, we may use this presentation in our conversations with investors and analysts.”*

While the excerpts above represent many of the private interactions described under Item 7.01, companies at times also use Item 7.01 to provide the public information on other important issues illustrated below.

- Callon Petroleum Co, September 13, 2005 – the company has attached as exhibits *“updated information with respect to damages from Hurricane Katrina and possible delays in restoring production from various oil and gas producing properties.”*
- Nektar Therapeutics, October 13, 2009 – *“On October 8, 2009, Nektar Therapeutics (“Nektar”) and AstraZeneca received early termination of the waiting period under the Hart-Scott-Rodino Act in connection with their worldwide agreement for NKTR-118 and NKTR-119.”*
- The Black & Decker Corporation, March 13, 2009 – *“With the current unprecedented challenges of the global economy and its effect on the Corporation’s worldwide revenues, the Corporation will implement the following cost reduction actions for its U.S. employees effective the first pay period in April 2009”*.
- Gymboree Corp, October 18, 2006 – the company *“completed the purchase of \$110 million of its outstanding common stock authorized under its share repurchase program”*.

## APPENDIX C. Constructing Connections

The BoardEx database provides social network data on company officials (including top executives and boards 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; and current employment status. BoardEx also provides information on executives' other social activities such as club memberships and 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 et al., 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. (2016), 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 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, associate, analyst, etc.

We construct a non-investment firm's connections to 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 to which a company has connections, denoted as *Connection*.  $Z\_Connection$  is *Connection* standardized every year to have a mean of zero and a standard deviation of one.

The following table reports summary statistics on connections for a sample of firms where we have 8-K filing data from the S&P Filing Dates database, connection data from BoardEx, and analyst forecast data from I/B/E/S from year 2001 to 2012. The sample contains 13,543 firm-years and 3,222 non-investment firms. 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 connections through different positions held

by individuals from the non-investment firm, we can see that an average non-investment firm has connections to 63 investment firms through directors, 6 through the CEO, and 10 through the CFO. A CFO is likely to have more connections to the investment community than a CEO probably because a CFO tends to have more finance/accounting education background and professional experience.

**TABLE C1. Connections to the Investment Community for 8-K Filing Firms**

	N of firm-years	Mean	Std Dev	P25	Median	P75
Number of Directors	13,543	7.884	2.602	6	8	9
Number of CEO	13,543	1.000	0.137	1	1	1
Number of CFO	13,543	1.183	0.470	1	1	1
<i>Connection</i>	13,543	71.787	51.732	31	60	101
<i>Connection via</i>						
Employment	13,543	58.972	47.416	22	47	84
Education	13,543	19.866	16.790	7	15	28
<i>Connection via</i>						
Directors	13,543	63.123	48.892	25	51	89
CEO	13,543	6.362	10.585	1	3	7
CFO	13,543	9.884	14.156	1	4	14
<i>Z_Connection</i>	13,543	0.000	1.000	-0.761	-0.140	0.641

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**TABLE 1. Form 8-K Filings and Connections**

This table shows the comparisons of firms with different levels of connections over the sample period 2001-2012. Panel A presents descriptive statistics for the full sample. Firm-years are classified into high-, medium-, and low-connection groups based on the tercile rankings of *Z\_Connection* every year. *Z\_Connection* is *Connection* standardized every year to have a mean of zero and a standard deviation of one, where *Connection* is the total number of investment firms to which a non-investment firm has education or employment connections. *Size* is natural logarithm of total sales for the firm during the year. *Num\_8K* is the number of 8-K filings per firm-year. *Num\_701* is the number of 8-Ks furnished under Item 7.01 (Regulation FD Disclosure). *Num\_801* is the number of 8-Ks filed under Item 8.01 (Other Events). Panel B presents descriptive statistics for the matched sample which contains 4,481 pairs of matched low-connection and high-connection firms. 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: Full Sample

	Connection-Low		Connection-Med		Connection-High		High minus Low			
	(N = 4,526)		(N = 4,496)		(N = 4,521)					
	Mean	Median	Mean	Median	Mean	Median	Mean		Median	
<i>Connection</i>	29.544	27.000	66.698	71.000	119.144	122.000	89.600	***	95.000	***
<i>Z_Connection</i>	-1.032	-0.999	-0.122	-0.140	1.155	0.990	2.188	***	1.989	***
<i>Size</i>	6.098	6.166	6.938	7.033	8.409	8.568	2.311	***	2.402	***
8-K Filings:										
<i>Num_8K</i>	2.781	2.000	3.333	2.000	4.121	3.000	1.340	***	1.000	***
<i>Num_701</i>	0.738	0.000	0.951	0.000	1.015	0.000	0.277	***	0.000	***
<i>Num_801</i>	0.927	0.000	1.140	1.000	1.554	1.000	0.626	***	1.000	***
Other firm characteristics:										
<i>ROA</i>	0.008	0.031	0.023	0.040	0.042	0.045	0.033	***	0.014	***
<i>MTB</i>	3.122	2.203	3.348	2.297	3.391	2.327	0.269	***	0.124	***
<i>Leverage</i>	0.494	0.483	0.530	0.532	0.609	0.614	0.115	***	0.131	***
<i>Loss</i>	0.288	0.000	0.239	0.000	0.160	0.000	-0.128	***	0.000	***
<i>lnAnalyst</i>	2.383	2.398	2.612	2.639	2.923	2.996	0.539	***	0.598	***



**TABLE 1. Continued**

Panel B: Matched Sample

	Connection-Low (N = 4,481)		Connection-High (N = 4,481)		High minus Low			
	Mean	Median	Mean	Median	Mean		Median	
<i>Connection</i>	29.584	27.000	106.924	115.000	77.339	***	88.000	***
<i>Z_Connection</i>	-1.032	-0.999	0.850	0.728	1.882	***	1.727	***
<i>Size</i>	6.129	6.192	6.132	6.186	0.003		-0.007	
8-K Filings:								
<i>Num_8K</i>	2.786	2.000	3.063	2.000	0.277	***	0.000	***
<i>Num_701</i>	0.742	0.000	0.813	0.000	0.071	**	0.000	
<i>Num_801</i>	0.923	0.000	1.040	0.000	0.117	***	0.000	***
Other firm characteristics:								
<i>ROA</i>	0.011	0.032	-0.002	0.032	-0.013	***	0.000	***
<i>MTB</i>	3.091	2.194	3.533	2.430	0.443	***	0.235	***
<i>Leverage</i>	0.496	0.486	0.496	0.498	0.000		0.012	
<i>Loss</i>	0.283	0.000	0.294	0.000	0.012		0.000	
<i>lnAnalyst</i>	2.325	2.303	2.477	2.565	0.152	***	0.262	***

**TABLE 2. Matched Sample Summary Statistics**

This table reports summary statistics for measures related to analysts' information environment for the matched sample. The sample contains 4,481 pairs of matched low-connection and high-connection firms and 26,208 non-earnings-announcement 8-K filing dates from 2001 to 2012. Panel A presents descriptive statistics for BKLS measures (*Commonality* and *lnIdiosync*) and firm-year characteristics. For the BKLS measures, the pre-filing and post-filing periods are denoted with subscript *pre* and *post* respectively. This panel also tests whether there are significant differences in the BKLS variables from the pre-filing period to the post-filing period where significant differences at the 10%, 5%, and 1% levels are denoted \*, \*\*, and \*\*\*, respectively next to the variables measured during the post-filing period. Panel B presents univariate comparison of BKLS measures across high- and low-connection firms. See Appendix A for detailed variable definitions. All continuous variables are winsorized at 1% and 99%.

## Panel A: Descriptive Statistics

Variable	N	Mean	Std Dev	P25	Median	P75
<i>Z_Connection</i>	26,208	-0.041	1.014	-0.965	0.370	0.768
<i>Commonality<sub>pre</sub></i>	26,208	69.4%	36.0%	47.8%	88.2%	97.9%
<i>Commonality<sub>post</sub></i>	26,208	66.4% ***	36.9%	38.8%	84.9% ***	96.9%
<i>lnIdiosync<sub>pre</sub></i>	26,208	2.054	2.278	0.101	1.155	3.503
<i>lnIdiosync<sub>post</sub></i>	26,208	2.423 ***	2.471	0.176	1.667 ***	4.055
<i>Size</i>	26,208	6.367	1.538	5.354	6.426	7.437
<i>ROA</i>	26,208	0.015	0.155	-0.012	0.035	0.091
<i>MTB</i>	26,208	3.442	3.765	1.481	2.288	3.852
<i>Leverage</i>	26,208	0.518	0.236	0.338	0.518	0.689
<i>Loss</i>	26,208	0.288	0.453	0	0	1
<i>absCAR</i>	26,208	0.040	0.045	0.011	0.026	0.052
<i>GDPR</i>	26,208	3.842	2.692	3.105	4.374	6.308
<i>Horizon</i>	26,208	0.661	0.285	0.411	0.674	0.901
<i>lnAnalyst</i>	26,208	2.629	0.629	2.197	2.639	3.045

## Panel B: Univariate Comparison

Variable	Connection-Low (N = 12,484)		Connection-High (N = 13,724)		High minus Low			
	Mean	Median	Mean	Median	Mean	Median		
<i>Commonality<sub>pre</sub></i>	71.1%	88.9%	67.8%	86.9%	-3.3% ***	-2.0% ***		
<i>Commonality<sub>post</sub></i>	67.0%	85.4%	65.9%	84.4%	-1.2% **	-1.1% ***		
<i>lnIdiosync<sub>pre</sub></i>	1.950	1.050	2.148	1.271	0.198 ***	0.221 ***		
<i>lnIdiosync<sub>post</sub></i>	2.367	1.568	2.474	1.761	0.107 ***	0.193 ***		

**TABLE 3. Proportion and Precision of Idiosyncratic Information in Analyst Forecasts**

This table reports results from OLS regressions of BKLS measures (*Commonality* and *lnIdiosync*) on firms' connections to the investment community using the matched sample. Panel A includes all non-earnings announcement 8-Ks. Panel B includes Reg FD-specific 8-Ks (8-Ks furnished under Item 7.01). Panel C includes all other non-Reg FD-specific 8-K filings (neither Item 7.01 nor Item 8.01). *Commonality* is the proportion of common information to the total information contained in analyst forecasts. *lnIdiosync* measures the precision of idiosyncratic information. *Z\_Connection* is *Connection* standardized every year, where *Connection* is the total number of investment firms to which a non-investment firm has education or employment connections. Standard errors are clustered at the firm level and the magnitudes of *t*-statistics are reported in the brackets. Year and two-digit SIC code industry fixed effects are included. This table also reports Wald chi-square tests on the difference between coefficients on *Z\_Connection* for the pre-filing and post-filing periods for each information measure. Significance at the 10%, 5%, and 1% level are denoted \*, \*\*, and \*\*\*, respectively. See Appendix A for detailed variable definitions. All continuous variables are winsorized at 1% and 99%.

Panel A: All Non-Earnings Announcement 8-Ks

	<i>Commonality</i>		$\Delta Commonality$	<i>lnIdiosync</i>		$\Delta Idiosync$
	Pre-filing	Post-filing		Pre-filing	Post-filing	
<i>Intercept</i>	83.502 *** [13.47]	62.395 *** [10.54]	-21.625 *** [4.67]	1.499 *** [3.56]	2.656 *** [6.34]	1.192 *** [3.92]
<i>Z_Connection</i>	-1.613 ** [2.35]	-0.153 [0.23]	1.562 *** [3.21]	0.106 ** [2.32]	0.045 [0.99]	-0.066 ** [2.56]
<i>Size</i>	1.128 [1.50]	0.844 [1.10]	0.016 [0.04]	-0.046 [1.04]	-0.011 [0.22]	0.015 [0.63]
<i>ROA</i>	18.353 *** [2.67]	19.433 *** [3.20]	0.550 [0.12]	-1.438 *** [3.11]	-1.433 *** [3.59]	-0.054 [0.25]
<i>MTB</i>	-0.293 [1.01]	-0.736 *** [3.23]	-0.402 [1.46]	0.018 [1.34]	0.055 *** [3.88]	0.034 *** [3.16]
<i>Leverage</i>	-0.340 [0.07]	-0.068 [0.01]	-0.625 [0.18]	-0.610 ** [2.13]	-0.636 ** [2.12]	0.007 [0.04]
<i>Loss</i>	4.801 ** [2.34]	5.527 *** [2.84]	0.751 [0.46]	-1.078 *** [8.54]	-1.128 *** [8.78]	-0.071 [0.90]
<i>absCAR</i>	33.082 *** [3.66]	14.706 [1.37]	-18.007 * [1.88]	-3.352 *** [6.01]	-2.311 *** [3.47]	1.076 ** [2.11]
<i>GDPR</i>	1.748 *** [3.04]	0.724 [1.42]	-1.066 ** [1.99]	-0.053 [1.64]	0.016 [0.56]	0.067 ** [2.27]
<i>Horizon</i>	11.959 ***	17.853 ***	6.023 ***	-2.160 ***	-2.725 ***	-0.576 ***

<i>lnAnalyst</i>	[4.81] -2.707 ** [2.07]	[9.19] -2.787 * [1.95]	[2.84] -2.499 ** [2.52]	[16.59] 0.256 *** [3.26]	[21.18] 0.254 *** [3.14]	[5.18] 0.157 *** [3.60]
Pre vs. Post: Coefficients on <i>Z_Connection</i>	1.460*** [ $\chi^2= 8.78$ ]			-0.061** [ $\chi^2= 4.80$ ]		
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
N	26,208	26,208	26,208	26,208	26,208	26,208
<i>Adj. R</i> <sup>2</sup>	7.1%	7.5%	2.3%	16.1%	19.7%	3.4%

Panel B: Reg FD-Specific 8-Ks

	<i>Commonality</i>			$\Delta$ <i>Commonality</i>	<i>lnIdiosync</i>			$\Delta$ <i>Idiosync</i>
	Pre-filing		Post-filing		Pre-filing		Post-filing	
<i>Intercept</i>	45.643 *** [3.90]		54.394 *** [4.60]	12.486 [1.40]	3.729 *** [3.92]		6.054 *** [6.96]	2.276 *** [4.37]
<i>Z_Connection</i>	-3.184 *** [3.05]		-0.965 [0.97]	2.487 *** [3.16]	0.172 ** [2.52]		0.058 [0.86]	-0.131 *** [3.17]
Pre vs. Post: coefficients on <i>Z_Connection</i>	2.219*** [ $\chi^2= 8.20$ ]			-0.114*** [ $\chi^2= 7.00$ ]				
Controls	Yes		Yes	Yes	Yes		Yes	Yes
Year fixed effects	Yes		Yes	Yes	Yes		Yes	Yes
Industry fixed effects	Yes		Yes	Yes	Yes		Yes	Yes
N	6,968		6,968	6,968	6,968		6,968	6,968
<i>Adj. R</i> <sup>2</sup>	11.7%		9.5%	4.5%	21.9%		23.0%	6.0%

**TABLE 3. Continued**

Panel C: Non-Reg FD-Specific 8-Ks

	<i>Commonality</i>				$\Delta$ <i>Commonality</i>	<i>lnIdiosync</i>				$\Delta$ <i>Idiosync</i>
	Pre-filing		Post-filing			Pre-filing		Post-filing		
<i>Intercept</i>	103.955	***	97.128	***	-7.994	1.737	**	1.747	**	0.074
	[8.14]		[8.38]		[0.64]	[2.53]		[2.36]		[0.12]
<i>Z_Connection</i>	-1.666	**	-1.260		0.503	0.111	**	0.103	*	-0.023
	[2.02]		[1.51]		[0.69]	[2.24]		[1.93]		[0.61]
Pre vs. Post: coefficients on <i>Z_Connection</i>		0.406				-0.008				
		[ $\chi^2=0.31$ ]				[ $\chi^2=0.04$ ]				
Controls	Yes		Yes		Yes	Yes		Yes		Yes
Year fixed effects	Yes		Yes		Yes	Yes		Yes		Yes
Industry fixed effects	Yes		Yes		Yes	Yes		Yes		Yes
N	10,991		10,991		10,991	10,991		10,991		10,991
<i>Adj. R</i> <sup>2</sup>	7.90%		9.00%		4.0%	15.4%		19.9%		5.4%

**TABLE 4. Bid-Ask Spread and Connections to the Investment Community**

This table compares the bid-ask spread around 8-K filings of high- and low-connection firms.  $Z\_Spread_{pre}$  ( $Z\_Spread_{post}$ ) is the standardized daily bid-ask spread (standardized using the mean and standard deviation of bid-ask spread for the fiscal year) averaged over the pre-filing (post-filing) BKLS window.  $\Delta Z\_Spread$  is the change in  $Z\_Spread$  from the pre- to the post-filing period.

	Connection - Low (N = 12,484)		Connection - High (N = 13,724)		High minus Low			
	Mean	Median	Mean	Median	Mean		Median	
$Z\_Spread_{pre}$	-0.011	-0.049	0.013	-0.020	0.024	***	0.029	***
$Z\_Spread_{post}$	-0.034	-0.066	-0.018	-0.051	0.016	***	0.015	***
$\Delta Z\_Spread$	-0.023	-0.021	-0.031	-0.026	-0.008	*	-0.005	**

**TABLE 5. Cyclicalty and Analysts' Idiosyncratic Information**

This table reports results from OLS regressions of BKLS measures (*Commonality* and *lnIdiosync*) on firms' connections to the investment community using subsamples of 8-Ks filed by firms with different levels of industry cyclicalty. *Commonality* is the proportion of common information to the total information contained in analyst forecasts. *lnIdiosync* measures the precision of idiosyncratic information. *Z\_Connection* is *Connection* standardized every year, where *Connection* is the total number of investment firms to which a non-investment firm has education or employment connections. Standard errors are clustered at the firm level and the magnitudes of *t*-statistics are reported in the brackets. Year and two-digit SIC code industry fixed effects are included. Significance at the 10%, 5%, and 1% level are denoted \*, \*\*, and \*\*\*, respectively. See Appendix A for detailed variable definitions. All continuous variables are winsorized at 1% and 99%.

	Low Cyclicalty				High Cyclicalty			
	<i>Commonality</i>		<i>lnIdiosync</i>		<i>Commonality</i>		<i>lnIdiosync</i>	
	Pre-filing	Post-filing	Pre-filing	Post-filing	Pre-filing	Post-filing	Pre-filing	Post-filing
<i>Intercept</i>	77.753 *** [7.20]	90.2 *** [10.60]	2.63 *** [4.37]	1.767 *** [3.36]	84.678 *** [11.01]	54.7 *** [3.19]	2.006 ** [2.34]	3.212 ** [2.38]
<i>Z_Connection</i>	-2.323 *** [2.93]	-0.982 [1.30]	0.159 *** [3.23]	0.112 ** [2.40]	0.919 [0.85]	2.696 ** [2.16]	-0.107 [1.16]	-0.203 * [1.86]
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	21,190	21,190	21,190	21,190	5,018	5,018	5,018	5,018
<i>Adj. R</i> <sup>2</sup>	7.30%	7.50%	15.60%	19.40%	4.50%	6.30%	20.30%	23.40%
Difference between coefficients on <i>Z_Connection</i>	1.342** [ $\chi^2 = 5.29$ ]		-0.048 [ $\chi^2 = 2.30$ ]		1.777** [ $\chi^2 = 4.54$ ]		-0.096 [ $\chi^2 = 2.60$ ]	

**TABLE 6. Delay, Fraction and Magnitude of Analysts' Forecast Revisions**

This table reports results on the association between firms' connections to the investment community and the incidence, speed and magnitude of analysts' forecast revisions around 8-K filings using the matched sample. Panel A and Panel B include descriptive statistics and univariate comparison. Panel C includes regression results. *Delay* is the average number of days between 8-K filing date and subsequent individual analyst forecast revisions, divided by the number of days between the 8-K filing date and the following annual earnings announcement date. *Fraction* is the number of analysts who revise their earnings forecasts within five days after the 8-K filing date, divided by the number of analysts following the firm prior to the 8-K filing. *Revision* is the absolute change in analyst earnings forecasts around 8-K filings, scaled by beginning-of-the-year stock price. Standard errors are clustered at the firm level and the magnitudes of *t*-statistics are reported in the brackets. Year and two-digit SIC code industry fixed effects are included. Significance at the 10%, 5%, and 1% level are denoted \*, \*\*, and \*\*\*, respectively. See Appendix A for detailed variable definitions. All continuous variables are winsorized at 1% and 99%.

## Panel A: Descriptive Statistics

Variable	N	Mean	Std Dev	P25	Median	P75
<i>Z_Connection</i>	26,208	-0.041	1.014	-0.965	0.370	0.768
<i>Delay</i>	26,208	0.141	0.108	0.065	0.116	0.189
<i>Fraction</i>	26,208	0.144	0.196	0.000	0.059	0.208
<i>Revision</i>	26,208	0.022	0.059	0.001	0.003	0.012

## Panel B: Univariate Comparison

Variable	Connection-Low (N = 12,484)		Connection-High (N = 13,724)		High minus Low			
	Mean	Median	Mean	Median	Mean		Median	
<i>Delay</i>	0.139	0.115	0.143	0.117	0.004	***	0.002	***
<i>Fraction</i>	0.147	0.056	0.141	0.063	-0.006	**	0.007	
<i>Revision</i>	0.025	0.003	0.018	0.002	-0.007	***	-0.001	***



**TABLE 6. Continued**

Panel C: Regression Results

	<i>Delay</i>	<i>Fraction</i>	<i>Revision</i>
	(1)	(2)	(3)
<i>Intercept</i>	0.191 *** [13.85]	0.025 [1.15]	0.077 *** [5.63]
<i>Z_Connection</i>	0.003 ** [2.22]	-0.003 [1.19]	-0.002 * [1.92]
<i>Size</i>	0.014 *** [11.95]	-0.007 *** [2.70]	-0.007 *** [6.36]
<i>ROA</i>	-0.031 ** [2.29]	0.047 * [1.90]	0.028 *** [2.82]
<i>MTB</i>	0.002 *** [2.76]	-0.001 [1.23]	-0.002 *** [4.89]
<i>Leverage</i>	-0.025 *** [2.63]	0.007 [0.45]	0.040 *** [6.02]
<i>Loss</i>	0.001 [0.28]	-0.016 ** [2.12]	0.033 *** [7.03]
<i>absCAR</i>	-0.242 *** [9.81]	1.011 *** [18.06]	0.059 *** [2.59]
<i>GDPR</i>	-0.001 [0.55]	0.006 *** [3.87]	-0.001 * [1.85]
<i>Horizon</i>	-0.189 *** [28.67]	0.046 *** [6.09]	0.009 *** [3.26]
<i>lnAnalyst</i>	-0.038 *** [16.76]	0.040 *** [9.48]	0.000 [0.17]
Year fixed effects	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes
N	26,208	26,208	26,208
<i>Adj. R</i> <sup>2</sup>	34.4%	18.1%	15.4%

**TABLE 7. Individual Analysts Who Cover Both High and Low Connection Firms**

This table presents the results on analyst reaction to 8-K filings for a subsample of individual analysts who cover both high- and low-connection firms. Panel A reexamines the association between connections and the average reaction (*Delay*, *Fraction*, and *Revision*) among this subset of individual analysts. Panel B examines the reaction at the individual analyst level holding the individual analyst constant. *Days* is the number of days between 8-K filing date and the date of the most recent individual analyst forecast issued after the filing.  $RelAccuracy_{pre}$  ( $RelAccuracy_{post}$ ) is relative accuracy measured as an individual analyst's absolute forecast error divided by the average absolute forecast error of all analysts covering the same firm before (after) the 8-K filing.  $\Delta RelAccuracy$  is the change in  $RelAccuracy$  from the pre- to the post-filing period.

Panel A: Average Reaction to 8-K Filings

	<i>Delay</i> (1)	<i>Fraction</i> (2)	<i>Revision</i> (3)
<i>Intercept</i>	0.204*** [20.56]	0.105** [2.07]	0.052*** [4.70]
<i>Z_Connection</i>	0.002** [2.04]	0.001 [0.12]	0.000 [0.38]
Controls	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes
N	19,082	19,082	19,082
<i>Adj. R</i> <sup>2</sup>	34.5%	13.4%	13.4%

Panel B: Reaction to 8-K Filings at the Individual Analyst Level

Variable	Connection - Low (N = 11,573)		Connection - High (N = 11,573)		Paired difference: High - Low (N = 11,573)			
	Mean	Median	Mean	Median	Mean		Median	
<i>Days</i>	28.784	23.333	30.169	26.050	1.386	***	1.835	***
$RelAccuracy_{pre}$	0.938	0.932	0.923	0.908	-0.016	***	-0.012	***
$RelAccuracy_{post}$	0.996	0.972	0.991	0.969	-0.005		-0.003	
$\Delta RelAccuracy$	0.058	0.050	0.068	0.070	0.011	*	0.016	***