Firms' Disclosure Strategies and Users' Information Acquisition*

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Abstract

I study how firms' disclosure strategies, i.e., smoothing and bundling, affect users' decisions to acquire information. Firms can reduce (augment) the amount of disclosures released simultaneously to the market by smoothing (bundling) disclosures, decreasing (increasing) the effect of disclosure overload. Examining the filing timestamps and download logs of non-earnings 8-Ks from 2003 to 2017, I find that smoothing increases information acquisition. Bundling induces short-term increases but long-term decreases in information acquisition. The results are consistent with smoothing mitigating the negative consequences of disclosure overload. Despite of firms' incentives to hide bad news through strategic disclosures, I find that strategic bad news disclosures are associated with higher information acquisition than non-strategic bad news disclosures. Furthermore, I document that the market reacts more positively to strategic disclosures with higher downloads, indicating that the effect of disclosure strategies is influenced by users' information acquisition.

Keywords: *Bundling; Smoothing; Information Acquisition; Disclosure Processing Costs*
JEL Classifications: *M40; M41*

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1 Introduction

Firms have discretion over various choices when they disclose——the timing of disclosure, the amount of information disclosed at one point in time, the rhetoric of disclosure etc. Each of the disclosure choices impacts users' perception of the news and thus firms have incentives to consider those choices carefully and sometimes strategically. Specifically, this study focuses on firms' disclosure strategies that affect the amount of simultaneous disclosures and how users' information acquisition is influenced by such strategies. Firms are required to disclose material events immediately after they arise,[1] so that users obtain the most timely and complete information about firm operations. However, firms can deploy two opposite disclosure strategies——smoothing or bundling——to control the amount of information disclosed simultaneously. Smoothing entails firms spreading disclosures of a single event, or several events that arise concurrently, over several points of time (Kasznik & Lev, 1995; Chapman, Reiter, White, & Williams, 2019), while bundling entails firms accumulating information of several events and disclosing it together at a single point in time (Dye, 2010; Tian, 2015; Segal & Segal, 2016). The non-strategic disclosure benchmark is the scenario where firms disclose all information about one event as soon as it arises at one point in time. The smoothed and bundled disclosures differ in terms of the amount of information simultaneously released to the market. Assuming a fixed amount of total information for each given event, the amount of information released at each point in time is larger when several events are bundled together than when only one or less than one event is disclosed (Chapman et al., 2019).

In this study, I consider a disclosure as strategic as long as it is not issued immediately after the natural occurrence of its underlying economic event, regardless of the managerial intention behind it. Unlike prior studies that commonly interpret strategic disclosure as

[1] Regulators have been promoting "real-time" financial reporting for two decades. In 2002, the Sarbanes-Oxley Act mandated firms to disclose material information on an almost real-time basis, followed by the acceleration of quarterly and annual reports filing dates in 2003, the 8-K reform in 2004, and the adoption of XBRL in 2009 and iXBRL tagging and 2019, respectively. Real-time reporting requires firms to "disclose news immediately after it arises *in the natural course of business*." (Tian, 2015, p. 2108, emphasis in original) However, criticism on real-time reporting asserts that it describes an ideal reporting regime that may be economically too costly or technically infeasible for firms.

opportunistic, and despite of the substantial overlap between strategic and opportunistic disclosures, I use the term "strategic" in a neutral sense.[2]

Disclosure overload, a phenomenon characterized by a large amount of disclosures being released to the market simultaneously, has become a real concern for regulators and professionals nowadays (Radin, 2007; White, 2013; Higgins, 2014). When users lack sufficient time and ability to process all available information, they rationally overlook or omit relevant information in decision making due to bounded rationality (Simon, 1955) and limited attention (Merton, 1987; Bloomfield, 2002; Hirshleifer & Teoh, 2003). The omission of information can lead to inferior decisions, resulting in severe market consequences in terms of liquidity, volatility and valuation (Chewning & Harrell, 1990; Miller, 2010; You & Zhang, 2009). I examine whether individual firm's disclosure strategies to manage simultaneous disclosures affect users' information acquisition.

When making the decision to acquire information, users face a trade-off between the expected costs and benefits of information acquisition and processing (Grossman & Stiglitz, 1980; Drake, Hales, & Rees, 2019). On the one hand, the expected benefits of information increase with the magnitude and materiality of firms' undergoing events, which are often linked to large amount of simultaneous disclosures. Therefore, users are more incentivized to acquire information when more news is released to the market, as compared to time when little or no news is released (Drake, Roulstone, & Thornock, 2015). To the extent that bundled disclosures contain more abundant and complete information than smoothed disclosures, users may have incentives to acquire more bundled disclosures than smoothed disclosures. On the other hand, the costs of acquiring and processing information also rise with the amount of simultaneous disclosures. With a fixed amount of total information to

[2] Prior studies document that firms bundle good news with bad news to mitigate the negative impact of bad news (Niessner, 2015; Segal & Segal, 2016; Brockbank & Hennes, 2018). Alternatively, firms smooth disclosures by splitting one piece of bad news into several episodes, reducing the magnitude of bad news pieces released to the market at a time (Kasznik & Lev, 1995). However, in some occasions, firms may disclose strategically out of "good faith." For example, Chapman et al. (2019) find that firms smooth disclosures to help investors better digest individual pieces of information, reducing the adverse effect of disclosure overload. Albeit well-intended, this type of smoothing still goes against the idea of "real-time" reporting, i.e., disclosing full information of the event immediately after it arises, and thus I consider it strategic as well.

be disclosed for a given event, disclosure overload is more likely to occur when all information of the event is released to the market simultaneously at one point in time rather than separately over several points of time. To the extent that smoothed disclosures effectively reduce the negative effect of disclosure overload, as compared to bundled disclosures (Chapman et al., 2019), users may have incentives to acquire more smoothed disclosures than bundled disclosures. To summarize, by smoothing (bundling) disclosures, firms effectively decrease (increase) the amount of information disclosed simultaneously to the market, which decreases (increases) the expected benefits as well as the costs associated with information acquisition and processing. Therefore, the aggregate effect of disclosure strategies on information acquisition is not clear ex-ante. However, given the well-documented salient adverse effect of disclosure overload (Chewning & Harrell, 1990; Eppler & Mengis, 2004; Drake et al., 2019; Chapman et al., 2019), the marginal costs of increased simultaneous disclosures may exceed their marginal benefits. Thus, I posit that overall users will acquire more smoothed disclosures than bundled disclosures.

Empirically, I measure disclosure strategies at the individual filing level using non-earnings 8-Ks. The 8-K filings contain two main timestamps: the filing date and the reporting period date. I use the former to identify the date on which the 8-K is filed and the latter to identify the date on which the underlying event takes place. Then I classify bundled 8-Ks as 8-K filings that share the same filing date but different event date with any other 8-Ks. Similarly, smoothed 8-Ks are the 8-K filings that share the same event date but different filing date with any other 8-Ks. In addition, I measure users' information acquisition by the accumulative number of human downloads for each 8-K filing within one, three, seven and thirty days since its filing date, using the EDGAR log files (Drake et al., 2015; Ryans, 2017). Users' information acquisition is more likely to be driven by the disclosure strategies rather than leaked disclosure content in the short-run comparing to the long-run. Thus, studying multiple time windows helps to disentangle the direct effect of disclosure strategies and the confounding effect of disclosure content.

Using non-earnings 8-Ks between 2003 and 2017, I find that both bundled and smoothed filings are associated with more downloads than non-strategic filings on the filing date and in the intermediate time windows, suggesting that users can identify and respond to strategic

disclosures by acquiring more rather than less information within short-run. Moreover, bundled filings receive more downloads on the filing date than smoothed filings, while smoothed filings receive more downloads in the intermediate time windows than the bundled filings, suggesting that bundling is effective in attracting information acquisition instantaneously and smoothing has a relatively steady and strong positive effect on information acquisition. However, the marginal effect of both disclosure strategies decreases as time window extends. In the long-run, on average bundled (smoothed) 8-Ks receive fewer (more) total downloads than the non-strategic 8-Ks, consistent with smoothing reduces the disclosure overload barrier to information acquisition (Chapman et al., 2019).

Furthermore, because disclosure strategies are endogenous decisions made conditional on the news and firms' information environment, it is an empirical challenge to draw causal inference from observational data. To alleviate this concern, I exploit the 8-K reform in 2004 as a plausible exogenous shock to bundling and provide further evidence on the impact of bundling on information acquisition. The main objective of the 8-K reform is to promote real-time reporting by preventing firms from delaying disclosures of material corporate events until the next periodic report (SEC, 2004). Tian (2015) documents that the 8-K reform effectively reduces bundling for events that managers have little control over the timing of their occurrences. Based on the prior evidence, I predict that bundling reduces users' information acquisition after the 8-K reform. Using a subsample of firms that used to bundle and smooth disclosures before the 8-K reform as the treated group, I employ a difference-in-difference design to compare users' information acquisition for the filings issued by the strategic and non-strategic firms in one year before and after the 8-K reform. Consistent with my prediction, I find that users' information acquisition is reduced for filings issued by bundling firms after the 8-K reform. Moreover, the effect of bundling on information acquisition is diminishing with expanding time windows in the post-reform period, consistent with bundling effect diminishing in the long-run. However, I do not find evidence of smoothing impacting on information acquisition in the 8-K reform setting, potentially because the 8-K reform does not change firms' smoothing practice.

Next, I explore whether the association between disclosure strategies and information acquisition is moderated by the nature of news. On the supply side of disclosures, firms'

disclosure strategies are likely to be influenced by news. For example, one important incentive for firms to strategically disclose is to mitigate the impact of bad news. On the demand side, anticipating firms' incentives to hide bad news using disclosure strategies, users may pay more attention to strategic bad news disclosures than non-strategic ones, leading to higher information acquisition. However, because of the complication of strategic disclosures, users may expect such a high information acquisition cost that deters them from acquiring the information, resulting in lower information acquisition. Thus, it is unclear whether and how the relationship between disclosure strategies and information acquisition differ by the nature of news. I examine this question using the disclosure tone as a proxy to classify good and bad news as communicated by managers. I document that users acquire more bad news 8-Ks when it is disclosed strategically via either bundling or smoothing, consistent with previous results that users rationally identify and respond to strategic disclosures. Additionally, I find that in the long-run, users have higher information demand for bad news and both disclosure strategies have a stronger positive effect on bad news acquisition compared to good news acquisition, suggesting that disclosure strategies tend to attract rather than deter users' information acquisition for bad news and that firms fail to hide bad news by bundling or smoothing.

In additional analyses, I investigate how the market reacts to disclosure strategies and whether the reactions are moderated by users' information acquisition to complement the prior literature on the effect of smoothing and bundling. I measure market reactions to the news releases using market-adjusted cumulative abnormal returns within various time windows since the 8-K filing date. I find that more information acquisition is associated with higher abnormal returns. Moreover, strategic disclosures are associated with additionally higher abnormal returns in the short-run when they receive higher downloads. These results suggest that users' information acquisition plays an essential role in the process of disclosures generating market reactions.

This study makes three contributions to existing literature. First, I contribute to the literature on smoothing and bundling by documenting a direct effect of such disclosure strategies on users' information acquisition. Disclosures stimulate market reactions through information acquisition (Blankespoor, deHaan, & Marinovic, 2020). Prior studies on smooth-

ing and bundling rely on the readily observable relationship between disclosure strategies and market reaction to extrapolate investors' actions in the intermediate step, which is aggregated and labeled as "investor attention". These studies present mixed evidence on the market reactions to smoothing and bundling.[3] However, the relationship between disclosure strategies and users' information acquisition has not been directly examined and we lack a fundamental understanding of the channels through which disclosure strategies elicit market reactions. In this study, I decompose the broad concept of investor attention and directly test whether disclosure strategies affect users' information acquisition. I document that overall smoothing increases information acquisition. Bundling induces short-term increase but long-term decrease in information acquisition. My results suggest that smoothing mitigates the negative consequences of disclosure overload (Chapman et al., 2019). I also complement the prior findings on the market impact of disclosure strategies by documenting that users react more positively to strategic disclosures that receive more downloads, indicating that information acquisition is an important factor that moderates the impact of disclosure strategies.

Second, I contribute to the literature on information acquisition by identifying disclosure strategies——the way in which news is disclosed that affects the amount of information being simultaneously released——as a new determinant of information acquisition. One closely related study is Rawson, Twedt, and Watkins (2020), which examines firms' practice of bundling negative non-earnings 8-Ks with unrelated press releases, attempting to divert investors attention away from bad news. They document that this strategic bundling effectively reduces the magnitude and speed of market reaction to the negative 8-K news

[3] For smoothing, Kasznik and Lev (1995) find that the market reacts more negatively to firms that issue pre-announcements to warn investors about earnings disappointments, consistent with market overreacting to pre-announcement warnings on negative earnings surprises. Their finding raises puzzles as to why firms keep issuing warnings and whether such smoothing strategy is truly effective in mitigating the impact of bad news. However, Chapman et al. (2019) find that smoothing is associated with increased liquidity, reduced stock price volatility and increased analyst forecast accuracy, providing rationality for firms' preference for smoothing. For bundling, prior studies mainly concentrate on good and bad news bundling and presumes that the main incentive of such type of bundling is to alleviate the adverse effect of bad news (Segal & Segal, 2016; Chapman et al., 2019). However, direct evidence on the effectiveness of bundling in mitigating bad news impact is rare. One notable exception is Tian (2015), which finds that bundling poison pill adoption disclosures with other news reduces the adverse market impact of the adoption news.

through diminished frequency of the 8-K downloads. Instead of focusing only on bundling, I contrast bundling with smoothing. The two disclosure strategies reflect different managerial incentives and result in opposite effect on simultaneous disclosures. Thus, a better understanding of how simultaneous disclosures affect information acquisition can be achieved through comparison between these two strategies.

Third, this study has implications on the regulatory trend to promote real-time reporting and the increasing public concern of disclosure overload. I examine two disclosure strategies, i.e., smoothing and bundling, that deviate from real-time reporting and represent the opposite end in the spectrum of simultaneous disclosure amount. My results suggest that users are more likely to acquire information when it is disclosed gradually over time, which potentially mitigates the disclosure overload problem caused by one-time full disclosures. These results also imply that real-time reporting may not benefit the users, as smoothing can improve market efficiency by encouraging more information acquisition by users.

2 Theoretical Framework

2.1 Simultaneous Disclosures and Disclosure Overload

Firms have discretion over the amount of information to be publicly released to the market at each point in time when they make disclosures. The amount of simultaneous disclosures impact users' information processing through cognitive process. The theories of bounded rationality (Simon, 1955) and limited attention (Merton, 1987; Bloomfield, 2002; Hirshleifer & Teoh, 2003) predict that, users rationally resort to simplified techniques when they lack sufficient time or ability to process all available information. For example, Drake et al. (2019) propose that users' decisions to acquire information is influenced by the disclosure overload barrier, in which overloaded users choose not to acquire information. In addition, they also read less of the disclosures and perceive them as less useful. These techniques and prejudice make users more likely to omit important information, resulting in inferior decisions that bring about negative market consequences with respect to liquidity, volatility and valuation (e.g. Chewning & Harrell, 1990; Miller, 2010; You & Zhang, 2009).

Disclosure overload has become a growing concern for regulators and professionals in recent years (Radin, 2007; White, 2013; Higgins, 2014). While firms' disclosure amount has augmented dramatically (Dyer, Lang, & Stice-Lawrence, 2017), users' time allocated to information acquisition and processing has not changed, or arguably has shrunk due to the increasing demand for quick decision-making (Chapman et al., 2019). Prior studies provide supporting evidence that simultaneous disclosures impact users' information acquisition and processing. Related to industry-wide simultaneous disclosures, deHaan, Shevlin, and Thornock (2015) document that earnings announcements filed on the busiest reporting days, when many firms report their earnings simultaneously, receive 30% decrease in EDGAR downloads. Hirshleifer, Lim, and Teoh (2009) find that high information load created by peer firms' releasing greater number of simultaneous earnings announcements leads to market underreactions to each individual firm's announcement. In addition, Ahci, Martens, and Sextroh (2022) study how simultaneous disclosures by a third party, i.e., the United States Patent and Trademark Office (USPTO), influence managers' information processing. They find that bundled patent grant disclosures impede managers' ability to gauge useful information for decision making from market's feedback. Instead of focusing on the simultaneous disclosures released by a group of firms or by a third-party agent, over which an individual firm does not have full control and thus are less likely to be manipulated, I study the amount of simultaneous disclosures released by each single firm, a disclosure choice subject to managerial discretion.

2.2 Disclosure Strategies to Manage Simultaneous Disclosures

Under the real-time reporting regime proposed by the SEC, firms should disclose all material information immediately after the event arises during the natural course of business. However, in practice firms can employ two disclosure strategies——smoothing and bundling——to manage the amount of simultaneous disclosures. Smoothing implies that firms break down the disclosure of one single event or several events that happen concurrently into several pieces and release one piece at a time. Assuming a constant level of the aggregate amount of disclosures for each given event, this strategy *reduces* the amount of simultaneous disclosures at one point in time, comparing to the hypothetical situation where

the same events are disclosed on a real-time basis. Prior studies document firms' practice of smoothing out of different incentives. For example, Kasznik and Lev (1995) document that firms tend to pre-exempt earnings disappointments by issuing pre-announcement disclosures to warn the market, in attempt to reduce the adverse consequences of negative earnings surprises. Chapman et al. (2019) find that firms smooth their disclosures of a single event over several days to combat disclosure overload.

In contrast, bundling implies that firms accumulate information of several events and disclose it together at one point in time. Assuming a constant level of the aggregate amount of disclosures for each given event, this strategy *augments* the amount of simultaneous disclosures at one point in time, comparing to the hypothetical situation where the same events are disclosed on a real-time basis. Dye (2010) develops an analytical model to study firms' reactions to the real-time reporting requirement and predicts that for many distributions of firms' cash flows, managers will choose to acquire and disclose information all at a single point in time. Tian (2015) documents that firms tend to bunch the disclosures of regular and in-play poison pill adoptions, which are perceived as bad news, with other news. Segal and Segal (2016) also find that firms bundle voluntary and mandatory news with conflicting signs to mitigate the negative impact of bad news.

Besides smoothing and bundling, some other studies related to strategic disclosure examine how *disclosure timing* across weekdays and trading hours affects users' information acquisition.[4] This study differentiates from the disclosure timing literature by focusing on how the amount of simultaneous disclosures influences information acquisition. Simultaneous disclosure amount and disclosure timing are two orthogonal factors that affects information acquisition and subsequent market reactions, as firms can choose to disclose a large or small amount of information on Fridays v.s. other business days or during trading hours v.s. after trading hours, when market attention is high or low.

[4] For example, deHaan et al. (2015) document that earnings announcements filed after trading hours are associated with a 19% decrease in EDGAR downloads. Brockbank and Hennes (2018) find that 8-Ks filed within a one hour and a half window after trading hours and on Fridays are associated with fewer EDGAR abnormal downloads. The rationale behind those findings is that investor attention to market news varies over time and is specially low on Fridays and after trading hours (Hirshleifer & Teoh, 2003).

2.3 Disclosure Strategies and Information Processing

Users' decision to acquire information is shaped by the trade-off between the expected benefits of trading on the information and the associated acquisition and processing costs (Grossman & Stiglitz, 1980; Drake et al., 2019). On the one hand, the expected benefits of information increase with the magnitude and materiality of firms' undergoing events. Although the magnitude and materiality of news is not directly observable before acquiring the information, firms' issuing large amount of simultaneous disclosures often serves as a signal of significant changes in the firms' operations, which increases the perceived magnitude and materiality of the news, leading to higher expected benefits of acquiring such information. Drake et al. (2015) document that users' acquisition of SEC filings does not occur randomly or uniformly across time, but concentrates on firms' news releases dates when value-relevant information is disclosed. Their evidence suggests that investors have more incentives to acquire information when more news is released, as compared to the time when little or no news is released. Thus, bundled disclosures should attract more information acquisition than smoothed disclosures as they contain more complete information of the underlying events comparing to the split pieces of information in smoothed disclosures. On the other hand, the costs of processing information also increase with the amount of simultaneous disclosures. Assuming a fixed total amount of information for a given event, disclosure overload is more likely to occur when all information of the event is released to the market simultaneously at one point in time rather than separately over several points of time. Smoothing can alleviate disclosure overload by two means. First, releasing only one piece of partial information per day creates less information load than releasing full information in one day. Second, separating information-rich disclosures by even a couple days gives users more time to gather and combine related information produced by other parties, to conduct computational analyses, to discuss with firms' stakeholders or management teams etc., so that users can better digest the information content (Chapman et al., 2019). Thus, smoothed disclosures should attract more information acquisition than bundled disclosures as they mitigate the adverse effect of disclosure overload, which deters users from acquiring information.

Overall, given the trade-off between the benefits and costs associated with simultaneous

disclosures, the aggregate impact of disclosure strategies on users' information acquisition remains an empirical question. If the marginal costs of increased simultaneous disclosures exceed their marginal benefits, I expect users to acquire more smoothed disclosures than bundled disclosures, leading to my first hypothesis.

> ***H1:*** *Smoothing (bundling) is positively (negatively) associated with users' information acquisition of the current disclosures.*

The second hypothesis relates to the role that the nature of news plays in the link between disclosure strategies and information acquisition. The association between disclosure strategies and information acquisition is co-determined by both the information supply (firms) and demand (users) sides. For the supply side, firms make disclosure strategy choices conditional on the nature of news. Gennotte and Trueman (1996) analytically show that firms prefer to disclose good news separately and bad news simultaneously. Consistent with this theory, Chapman et al. (2019) find that firms are more likely to smooth disclosures when the news is positive. Moreover, they also document that firms disclose good news more quickly after bad news than they do after good or neutral news, suggesting that firms are more likely to bundle rather than smooth bad news disclosures. In contrast, Kasznik and Lev (1995) find that firms are more likely to smooth bad news than good news by issuing warnings before the official announcements of negative earnings surprises. Overall, although prior literature suggests that firms strategically disclose based on the nature of news, there is no consensus on the correspondence between disclosure strategies, i.e., smoothing and bundling, and the nature of news (good and bad). In fact, occasionally firms may employ both strategies to mitigate the impact of bad news. Therefore, it is not clear ex-ante whether users are able to identify the nature of news by observing firms' disclosure strategies.

For the demand side, users also have asymmetric information demand for good and bad news. Because human brains weigh losses more than gains, risk averse users are likely to demand more information for bad news than for good news (Dickhaut, Basu, McCabe, & Waymire, 2010). Drake, Roulstone, and Thornock (2016) find that information acquisition for historical accounting reports is positively associated with current negative earnings shocks, suggesting that users seek for backward-looking contextualization in the historical

reports to understand what led to the current bad news. Also, many users, such as lenders, suppliers and customers, have asymmetric pay-offs and are more concerned with decreases rather than increases in firm value. Users' asymmetric pay-off induces higher required degree of verification for gains than for losses, which is widely documented in the conservatism literature (e.g. Basu, 1997; Watts, 2003). Given that users anticipate that firms may adopt different disclosure strategies for good and bad news, and that users have asymmetric information demand for good and bad news, I posit that they rationally adjust their information acquisition decisions to different disclosure strategies conditional on the nature of news. Thus, I formulate my second hypothesis as follows.

> ***H2:*** *The association between disclosure strategies and users' information acquisition is asymmetric across good and bad news.*

3 Research Design

3.1 Measurements

3.1.1 Disclosure Strategies

I measure firms' disclosure strategies using 8-K reports. Form 8-K is a non-periodic report that firms must file to notify investors about material events. Due to the flexibility and unpredictability of 8-Ks, they provide more reporting time variation than the periodic reports such as 10-K and 10-Qs, facilitating the analysis of discretionary disclosure strategies.

I focus only on *non-earnings* 8-Ks for two reasons. First, earnings announcement 8-Ks are by definition bundled with 10-K/Qs, and are also frequently accompanied by disclosures of other material events. This makes the earnings announcement 8-Ks different from other non-earnings 8-Ks and thus it is inappropriate to compare across the two types of 8-Ks. Focusing solely on the earnings announcement 8-Ks would create a lack of variation in the employment of disclosure strategies, as there are few earnings announcement 8-Ks that are not bundled with 10-K/Qs. Second, earnings announcements are pre-scheduled and anticipated by the market, providing little timely new information to the market (Ball & Brown, 1968). The role of earnings potentially lies more in contracting and verification

rather than communicating news to the market (Ball & Shivakumar, 2008). However, in this study I focus on how managerial discretion in *disclosing new information* affects investors' information acquisition, which makes the unanticipated non-earnings 8-Ks more relevant than the earnings announcement 8-Ks.

I measure disclosure strategies at filing level. Typically, 8-K filings on EDGAR contain three timestamps: the filing date, the acceptance date and the reporting period date. Filing date is the date when the report is filed to EDGAR. Acceptance date and time indicate the time when the filing is accepted by EDGAR. Reporting period date is the end date of reporting period of the filing.[5] I take the reporting period date as the event date (Chapman et al., 2019).

I define smoothed filings as those that share the same event date but different filing date with other 8-Ks. This measure captures the cases where firms report one event or several events that take place concurrently in separate 8-Ks during the following days.

I define bundled filings as those that share the same filing date but different event date with other 8-Ks. Firms are required to report any material events immediately after the natural occurrence of such events. Therefore, when a firm files more than one 8-Ks in a day to report events that happened on different dates, the firm is suspected of engaging in bundling. However, this measure does not capture the possible bundling cases where a firm files an 8-K with more than one items, or files more than one 8-Ks with the same event date in a day. Those cases can be interpreted in two ways. First, there are several events that take place together in one day by chance during the natural course of the business, in which case the firm is not strategically bundling the disclosures of the underlying events, but the disclosures are "bundled" by themselves as a result of normal business operations. Second, the firm could time the occurrence date of the several events that should have happened on different dates to one day and bundle the disclosures of those events together, in which case the firm is engaging in real management to achieve bundling (Tian, 2015). It is empirically

[5] See "How can I understand EDGAR Timestamps?" at https://www.sec.gov/about/webmaster-faq.htm. Normally, EDGAR automatically accept filings within two minutes from the receipt of submission (SEC, 2020). Thus, in above 90% of 8-K filings, the filing dates coincide with acceptance dates. In a robustness check, I focus only on the 8-K filing with the same filing date and acceptance date, and the main results remain unchanged.

difficult to disentangle these two situations, and thus I cautiously exclude those in measuring bundled 8-Ks. By excluding those cases my bundling measure may incur Type II errors, but it provides a lower bound estimation of the bundling phenomenon.

3.1.2 Information Acquisition

I measure users' information acquisition using EDGAR log files.[6] EDGAR log files provide detailed data of internet search traffic for EDGAR filings.[7] In this study, I proxy information acquisition by the accumulative number of human requests for each 8-K filing within X days since its filing date (NumReqX). I follow Ryans (2017) to filter machine requests and focus only on the human requests because my hypotheses are developed based on human behavioral theories, which may not apply to machines that operate according to programmed algorithms and thus may not be affected by disclosure strategies. Alternatively, I use other two sets of criteria to filter machine requests (Drake et al., 2015; Loughran & McDonald, 2017) and my empirical results are robust to these alternative measurements of human information acquisition.

The information acquisition periods that I study are 1/3/7/30 days since the filing date. I consider EDGAR downloads within 1 and 30 days as the proxies for short-term and long-term information acquisition, respectively. The 3 and 7 days are intermediate periods.[8] I study the impact of disclosure strategies on information acquisition over multiple time windows for two reasons. First, the pattern of information acquisition is different across short and long time windows because the relevance of and the public attention to the news

[6] I thank James Ryans for generously sharing the consolidated EDGAR log datasets and code through his personal website (www.jamesryans.com).

[7] Prior studies exploit the EDGAR log files to study the determinants and consequences of information acquisition (Drake et al., 2015), usefulness of historical accounting reports (Drake et al., 2016), user's consumption of financial information (Loughran & McDonald, 2017), the information content of EDGAR downloads (Drake, Johnson, Roulstone, & Thornock, 2020), information flows among industrial rivals (Bernard, Blackburne, & Thornock, 2020), information acquisition by institutional investors (Chen, Cohen, Gurun, Lou, & Malloy, 2020) and by analysts (Gibbons, Iliev, & Kalodimos, 2021), and competition in bidding process among auditors (Hallman, Kartapanis, & Schmidt, 2022).

[8] In a high-frequency or algorithmic trading world, information dissemination is measured in seconds and information advantage of only a few milliseconds can translate into significant economic value (Rogers, Skinner, & Zechman, 2017). However, the purpose of this study is to analyze human pattern of information acquisition, which can be constrained by behavioral biases and takes considerably longer time.

die down along time. Second, a major concern is that the observed changes in information acquisition may be attributed to disclosure content, i.e., what is disclosed, rather than the disclosure strategies, i.e., how is it disclosed. However, theoretically users should not know the disclosure content when they make the decision to acquire information or not, unless they decide to acquire the information because they become aware of the news via information intermediaries, who may have leaked some disclosure content to the users at the same time. It is the leakage of disclosure content that makes it a potential confounding factor that also influences users' information acquisition. Nonetheless, in the short time window, users' information acquisition decisions are less likely to be influenced by the disclosure content leakage because it also takes time for information intermediaries to acquire and integrate the original firm disclosure and then reproduce their articles. The leakage is more likely to happen in long time windows, so those long-term measures are more likely to capture the equilibrium outcome in information acquisition.

3.2 Sample

I start with all 8-K filings retrieved from EDGAR between January 2003 and May 2017, which corresponds to the data period of EDGAR daily log files. I exclude 8-Ks containing Item 12 or Item 2.02 (Results of Operations) because those 8-Ks are related to quarterly or annual earnings announcements. Next, I exclude all 8-Ks filed in firm-years without any bundled or smoothed 8-Ks. This is to address the concern that firms' choices to use disclosure strategies are endogenous and firms that choose to strategically disclose in a certain year can be quite different from those that do not, and therefore it is inappropriate to compare disclosures across the two types of firms, or across time when the same firm have different degree of incentives to disclose strategically. Finally, after merging the EDGAR dataset with Compustat, I/B/E/S and Thomson Reuters 13F data to obtain firm fundamentals, analyst and institution ownership data, I drop filings that are a) classified as both bundled and smoothed,[9] or b) issued by financial or utility firms or c) issued by firms with non-positive

[9] For example, Air Products & Chemicals, Inc. (CIK = 0000002969) filed two 8-Ks (A and B) on March 20 of 2006. The event date of A is March 16 and B is March 20. Two days later, this firm filed another

book value of equity. Table 1 illustrates the sample selection process. The final sample contains 59,730 8-K filings from 2,118 firms from 2003 to 2017.

[Insert Table 1 about here]

3.3 Summary Statistics

Table 2 Panel A presents summary statistics of key variables for full sample. An average 8-K receives 7/15/21/36 downloads within 1/3/7/30 days since it is filed to SEC, and the distributions are all skewed to the right. The average requests per day diminishes approximately from 7 to 1.2 from one to thirty days period, suggesting that users' information acquisition concentrates on the information release date and decreases overtime. Smoothing makes up for 13% of the final sample while bundling is relatively rare, with only 7% of 8-Ks being bundled. On average, an 8-K main report contains 564 words, which is significantly shorter than quarterly or annual reports. Most 8-Ks contain two items. The average sentiment of 8-Ks is almost neutral, with only 0.71 net negative word in one thousand words. Consistent with He and Plumlee (2020), 58% of the 8-Ks are voluntary.[10] Consistent with Segal and Segal (2016), the 8-Ks are filed almost uniformly throughout weekdays from Monday to Friday. Moreover, 66% of the 8-Ks are filed after trading hours, which is higher than Segal and Segal (2016)[11] but lower than Michaely, Rubin, and Vedrashko (2016).[12] The correlation matrix of all the variables is provided in Online Appendix Table A1.

[Insert Table 2 Panel A about here]

Table 2 Panel B presents the mean and median of key variables by disclosure strategies. The sample contains 7,502 smoothed 8-Ks from 1,682 unique firms. Untabulated statistics

8-K (C) with the same event date as A (March 16) on March 22. According to my identification criteria for bundled and smoothed filings, A is classified as both bundled and smoothed.

[10] I classify an 8-K as voluntary if at least one of the following voluntary 8-K items: Items 5, 9, 12 before and Items 8.01, 7.01, 2.02 after the 8-K reform (Lerman & Livnat, 2010; He & Plumlee, 2020).

[11] Segal and Segal (2016) treat about 10% of the non-earnings 8-K filed before market opens (BMO) as filed during trading hours (see their footnote 11), whereas I treat them as after-trading-hours (ATH) observations. Adjusting for this difference, my summary statistics regarding ATH are consistent with theirs.

[12] Michaely et al. (2016) document an average of about 92% earnings news being announced out of trading hours (see their Table 1). However, considering that I focus on non-earnings rather than earnings news, our sample composition may differ substantially.

indicate that in over 90% of the smoothed cases, firms split the disclosures for same-day events over two different dates, and the maximum number of splits is four. The average time lag between the first and the last disclosure for the same-day events is 9 days. The most frequent items in smoothed filings before the 8-K reform are Financial Statements and Exhibits (40%), Other Events (30%), Regulation FD (19%), Acquisition or Disposition of Assets (10%) and Changes in Registrant's Certifying Accountant (1%). While after the reform the most frequent items are Financial Statements and Exhibits (35%), Other Events (16%), Entry into a Material Definitive Agreement (14%), Departure of Directors or Certain Officers; Election of Directors; Appointment of Certain Officers; Compensatory Arrangements of Certain Officers (10%) and Regulation FD (9%). Column 7 presents the differences of mean for key variables between smoothed and non-strategic disclosures. It indicates that a smoothed 8-K receives 1 more download than a non-strategic 8-K on filing day, equivalent to a 17% (=1.14/6.82) increase on average. When looking at the intermediate and long-term periods, smoothed 8-Ks receive roughly 2 more downloads, equivalent to 10% more downloads on average. The marginal increases in downloads are diminishing over time. Moreover, smoothed 8-Ks are lengthier, more negative, less readable and are more likely to be mandatory disclosure than the non-strategic 8-Ks. Given the existing issues with null hypothesis significance testing (e.g. Ziliak & McCloskey, 2008; Wasserstein & Lazar, 2016; Wasserstein, Schirm, & Lazar, 2019), I do not present or discuss the statistical significance of results in this study but provide the test statistics with them.

The sample also contains 4,452 bundled 8-Ks from 1,180 unique firms. Untabulated statistics indicate that for the bundled cases, on average firms file two 8-Ks with different event dates in a day, and the maximum number of 8-Ks filed in a day is four. The most common bundling combinations before the 8-K reform are Regulation FD with Other Events (22%), Acquisition or Disposition of Assets with Other Events (2%) and Regulation FD with Acquisition or Disposition of Asset (1%). While after the reform the most common bundling combinations are Entry into a Material Definitive Agreement with Other Events (5%), Departure of Directors or Certain Officers; Election of Directors; Appointment of Certain Officers; Compensatory Arrangements of Certain Officers with Other Events (4%) and

Entry into a Material Definitive Agreement with Regulation FD (4%).[13] Column 9 presents the differences of mean for key variables between bundled and non-strategic disclosures. It indicates that bundled 8-Ks receive more downloads than the non-strategic 8-Ks on the filing date and within 3 days since the filing date but fewer downloads within one week or one month, suggesting that bundled disclosures attract more attention around the filing date but less attention in the long-run. Moreover, bundled 8-Ks are also slightly lengthier and more negative than non-strategic 8-Ks. The other attributes of bundled 8-Ks are very similar to those of non-strategic 8-Ks.

[Insert Table 2 Panel B about here]

Figure 1 illustrates the time trends of accumulative 8-K downloads by disclosure strategies. The figure shows that the median accumulative 8-K downloads almost triple from 2004 to 2016. Also, the accumulative downloads become more volatile over time. The time trends of accumulative downloads over short and long periods are similar. The bundled 8-Ks receive most volatile downloads while the non-strategic 8-Ks receive most stable downloads. Notice that from October 2005 to March 2006, there is a half-year period in which the medians of accumulative downloads are zero. It remains a puzzle to investigate if it is not due to the EDGAR data omission.[14]

[Insert Figure 1 about here]

[13] I exclude any bundling combinations with Item Financial Statements and Exhibits because this item itself does not report a stand-alone event. It is a frequently used item which signals that this 8-K filing contains supplement materials, such as any exhibits of press releases, earnings announcements with financial statements, graphics, letters to shareholders etc.

[14] The datasets provided by Ryans (2017) contain considerably fewer records for filing downloads in 2005 and 2006. The size of the raw data files for 2005 and 2006 are 58.5MB and 56.2MB, respectively, which are smaller compared to those of the year before (2004, 92.8MB) or the year after (2007, 108MB).

4 Results

4.1 Disclosure Strategies and Information Acquisition

I study the association between disclosure strategies and information acquisition using the following OLS regression.

$$LogReqX = \beta_0 + \beta_1 Smooth + \beta_2 Bundle + \sum_{n=1}^{n} \beta_n CONTROLS + \epsilon \quad (1)$$

where LogRegX stands for the natural logarithm of one plus the number of accumulative human downloads within X days since the filing date (NumReqX). Smooth (Bundle) is set to 1 if the 8-K is smoothed (bundled), and 0 if it is non-strategic. CONTROLS represents a vector of control variables that can be categorized into three groups. First, I control for firm characteristics that affect firms' information environment and visibility, which ultimately affect users' information acquisition. Those include firm size (Size), growth potential as proxied by book-to-market ratio (BTM), leverage ratio (Lev), analyst coverage (AnaCov) and institutional holdings (InsOwn) (Drake et al., 2015). Second, to separate the effect of disclosure content and that of disclosure strategies on users' incentives to acquire information, I control for the news readability and content using the Gunning Fog index (Fog) and tone (Tone) of the 8-K main report. Tone is calculated using the Loughran and McDonald dictionary, taking into account negative negations (Loughran & McDonald, 2011). Third, I control for other disclosure timing practices by including indicators for Friday (Friday) and after-trading-hour (ATH) filings because these practices have documented effect on users' information acquisition (e.g., Patell & Wolfson, 1982; deHaan et al., 2015; Segal & Segal, 2016; Michaely et al., 2016). I use firm fixed effects to remove the invariant firm characteristics and I compare the information acquisition of strategic and non-strategic disclosures within the same firm. I also include year-month fixed effects to remove the upward trend of accumulative 8-K downloads over time, as illustrated previously in Figure 1. The coefficients of interest are β_1 and β_2, which capture the effect of smoothing or bundling on 8-K downloads. If the disclosure strategies attract (deter) users' information acquisition, the corresponding coefficients should be positive (negative).

Table 3 presents the results of Equation (1). Overall, the coefficients of *Smooth* and *Bundle* in the first and third row of the table indicate that both smoothed and bundled 8-Ks are associated with economically significant differences in users' downloads comparing to the non-strategic 8-Ks, suggesting that users do respond to such disclosure strategies. However, according to the results of Wald tests that compare the coefficients of *Smooth* and *Bundle* in the fifth row, users' responses to the two strategies are different. Specifically, Column 2 indicates that while smoothed 8-Ks receive 10.3% ($=e^{0.098}-1$) more downloads compared to non-strategic 8-Ks *on the filing date*, bundled 8-Ks receive 12.3% ($=e^{0.116}-1$) more, suggesting that bundling is more effective in attracting users' information acquisition in the short-run, consistent with more simultaneous disclosures increasing users' awareness and expected benefits of acquiring information. In contrast, Columns 8 indicate that smoothed 8-Ks receive 4.8% ($=e^{0.047}-1$) more downloads *within 30 days since filing date*, while the bundled 8-Ks receive 2.2% ($=e^{0.022}-1$) fewer downloads within the same period, as compared to the non-strategic 8-Ks. This result suggests that in the long-run, smoothing (bundling) is associated with more (less) information acquisition, consistent with disclosure overload reducing users' willingness to acquire information. In the intermediate periods (Column 4 and 6), both strategies are associated with higher information acquisition. All results are similar without fixed effects or clustering of standard errors, as shown in the odd columns.

Figure 2 compares the coefficients of different disclosure strategies on filing downloads for different time windows. To summarize, the findings of this exercise are threefold. First, the two strategies have the strongest positive impact on downloads on the filing date or within 3 days since the filing date, but the marginal effect of the strategies decreases as the time window extends. Second, in the long-run, on average bundled 8-Ks receive slightly fewer total downloads, while smoothed 8-Ks receive more than the non-strategic 8-Ks. Finally, although bundling has a greater impact on downloads on the filing date than smoothing, smoothing is associated with a higher increase in downloads than bundling in the intermediate and long time periods, consistent with smoothing effectively reduces the impact of disclosure overload (Chapman et al., 2019).

[Insert Figure 2 about here]

Apart from disclosure strategies, other factors also influence users' information acquisition. For instance, disclosure tone and earnings are negatively associated with downloads, suggesting that bad news, regardless of being communicated via soft (disclosure) or hard (recognition) channels, are more likely to attract users' attention and increase information acquisition. Also, earnings have a much stronger economic impact on downloads than tone, potentially due to the higher credibility of hard information. Disclosure timing also matters. 8-Ks filed on Friday receive significantly fewer downloads than those filed on Monday. This negative Friday effect is especially pronounced when looking at downloads within 1 day (-20%), i.e., on Friday, and 3 days (-42%), i.e., from Friday to Sunday, which is consistent with people's lack of attention to firm disclosures outside of working hours. But the Friday effect persists in longer time windows——a week or a month——as well, although the magnitude of such effect is reduced to only -4%. Moreover, 8-Ks filed after trading hours receive 7% fewer downloads on the filing date potentially because fewer people stay alert outside of working hours. However, those 8-Ks actually receive more downloads within 3 days or longer time windows comparing to those filed within trading hours, suggesting that users paying higher attention to strategic timing (Segal & Segal, 2016). Finally, analyst coverage and leverage ratio are also positively associated with filing downloads, which can be explained by a) higher public visibility of firms that are able to borrow heavily and attract more analysts, or b) the downloads being generated by debtors and analysts, which are two of the major financial information users (Gibbons et al., 2021). In contrast, institutional ownership is negatively associated with filing downloads, consistent with institutional investors relying on private rather than public communication channels to acquire firms' financial information.

[Insert Table 3 about here]

4.2 8-K Reform as an Exogenous Shock to Bundling

To identify the effect of disclosure strategies on information acquisition, ideally I would like to keep all *other factors* that potentially affect users' information acquisition decisions——firm information environment, disclosure content, and disclosure timing——constant, and only modify the firms disclosure strategies to observe whether and how information acquisition

changes. However, by definition, firms' disclosure strategy is a discretionary choice, which is also likely to be determined conditional on the "other factors" listed above, making the ideal identification setting difficult to achieve. Alternatively, I try to address this endogeneity concern using the 8-K reform in 2004 as a plausible exogenous shock to firms' disclosure strategies.

On August 23 of 2004, the SEC adopted an 8-K reform that introduced three main amendments to Form 8-K: (a) expanding the scope of events subject to mandatory 8-K disclosure, (b) creating a new topical format, and (c) shortening the filing deadline of 8-Ks (SEC, 2004; Lerman & Livnat, 2010). The primary goal of this 8-K reform is to promote real-time reporting by preventing firms to delay disclosures of material corporate events until the due date for its next periodic report (SEC, 2004). Consistent with the reform's intended goal, McMullin, Miller, and Twedt (2019) study the increased frequency of mandatory 8-K reports under the post-reform 8-K regime, and document a higher speed of price formation after the 8-K reform.

Given the amplified list and tightened reporting deadlines for the mandatory events, which limit managers ability to postpone the disclosures of events after their occurrences, I posit that the 8-K reform effectively constraints bundling, and thus reducing users' information acquisition due to bundling in the short-run. Consistent with the prediction that 8-K reform constrains bundling, Tian (2015) documents a significant reduction in bundling after the 8-K reform for those corporate events that managers have limited control over the timing of occurrence of the underlying events, for instance the in-play poison bill adoptions. However, it remains unclear whether the 8-K reform has any effect on smoothing. The 8-K reform does not explicitly mandate, or cannot effectively enforce firms to disclose one event, or several concurrent events in one integrate report. Therefore, firms can disclose only partial information in the first disclosure of the events to meet the new 8-K reporting requirements, and then release the remaining information of the same events over subsequent days as follow-up disclosures. To my knowledge, there is no existing theoretical argument or empirical evidence of the 8-K reform's impact on smoothing.

I construct the sample for 8-K reform analysis by the following steps. First, I restrict the 8-K sample to the time period from September 1, 2003 to September 1, 2005, which

is one year before and after the 8-K reform. Next, I label firms that have ever employed smoothing (bundling) *before* the 8-K reform as smoothing (bundling) firms. Firms that have never issued strategic disclosures *before* the 8-K reform are labeled as non-strategic firms. I keep only the 8-K filings issued by these labeled firms in both pre- and post-reform periods. I also drop 8-K filings that are filed on the August 23, 2004. After the additional selections, I obtain a final 8-K reform sample consisting of 4,471 observations in total. Online Appendix Table A2 provides detailed sample composition by time and by disclosure strategies.

To validate the effect of 8-K reform on firms' strategic disclosure behaviors, Figure 3 illustrates the percentage of 8-K filings issued by strategic and non-strategic firms before and after the 8-K reform. This figure indicates that before the 8-K reform, 8-Ks issued by smoothing, bundling and non-strategic firms roughly make up for one thirds of the total pre-reform sample, respectively. While after the 8-K reform, 8-Ks issued by smoothing and bundling firms reduce by 11% and 7% respectively, suggesting a declining trend of strategic disclosures after the 8-K reform. This descriptive evidence provides support to the premise that the 8-K reform reduces smoothing and bundling.

[Insert Figure 3 about here]

Given the 8-K reform as a plausible negative shock to bundling, I study the effect of disclosure strategies on users' information acquisition using a difference-in-difference (DiD) design. A generalized DiD model is specified as follows.

$$LogReqX_{i,t} = \beta_0 + \beta_1 DisStr_j + \beta_2 Post_t + \beta_3 DisStr_j \times Post_t + \sum \beta_n CONTROLS_{i,t} + \epsilon_{i,t} \quad (2)$$

where $LogReqX_{i,t}$ is the natural logarithm of one plus the of accumulative human downloads within X days since the filing date (NumReqX) for filing i at time t. The treatment indicator $DisStr_j$ for firm j is set to 1 if the 8-K is issued by a smoothing or bundling firm, and 0 if it is issued by a non-strategic firm.[15] The time indicator $Post_t$ is set to 1 if the 8-K is issued in

[15] In this 8-K reform DiD analysis, I classify the strategic (treatment) and non-strategic (control) groups at firm level rather than filing level because each 8-K file can only be filed once, either before or after the 8-K reform, so the same units (filings) cannot be observed in both periods, which challenges the requirement of DiD identification. In classifying treatment and control groups at firm level, I assume that firms' propensity

the post-reform period and 0 otherwise. $CONTROLS_{i,t}$ denotes a vector of control variables for filing i at time t, including *Tone, Fog, VolDisc, Friday, ATH, Size, BTM, Lev, Earn, AnaCov* and *InsOwn*. The coefficient of the interaction term (β_3) in Equation (2) captures the effect of disclosure strategies on users' information acquisition. Since I expect the firms that used to bundle in the pre-reform period to issue fewer bundled 8-Ks, leading to fewer downloads in the short-run and more downloads in the long-run, β_3 should be negative, and the magnitude of the coefficient should be decreasing over time for bundling.

The parallel trends assumption of the DiD identification requires the treated and control groups to have similar trend in the outcome of interest before the treatment. In the context of this study, I validate this assumption by plotting the average accumulative downloads of 8-K filings by disclosure groups in the time period of three quarters before and after the 8-K reform. Figure 4 shows that in the last two quarters before the 8-K reform, the average accumulative downloads of 8-K filings for different disclosure groups share very similar patterns. Between the fourth quarter of 2003 and the first quarter of 2004, all groups experience an increasing trend in the average accumulative downloads, although the non-strategic group has a slower increasing rate comparing to the strategic groups. However, after the 8-K reform, the distance in the average accumulative downloads between the three groups enlarges significantly, especially that between the bundled and the non-strategic group. For the short-term and intermediate periods, the level of the accumulative downloads of the bundled group is higher than that of the non-strategic group in the last two quarters before the reform, while this relationship reverses after the reform. The distance between the smoothed and the non-strategic group also widens in the first two quarters immediately after the reform, but the difference is reduced in the third quarter. Overall, this figure lends support to the parallel trends assumption before the 8-K reform and suggests a diminishing effect of the reduced bundling imposed by the 8-K reform on average accumulative downloads.

[Insert Figure 4 about here]

to disclosed strategically is intrinsically stable over time, and is only reduced by the exogenous shock of the 8-K reform. This allows me to observe the patterns and outcome of strategic disclosures by the same units (firms) in the pre- and post-periods.

Table 4 presents the regression results of Equation (2). The coefficients of *Smooth* and *Bundle* have similar economic magnitude and sign as in Table 3, confirming the effect of smoothing and bundling on information acquisition discussed in the previous section. The *Post* indicator is positively associated with 8-K downloads across various time windows, suggesting higher users' information acquisition via EDGAR in the post-period, which may be due to an increased informativeness of the 8-K filings after the 8-K reform (McMullin et al., 2019). The coefficients of *Bundling*×*Post* are negative, indicating a 19% ($=e^{0.213}-1$) and 18% ($=e^{0.201}-1$) decrease in accumulative downloads on the filing date and within 3 days since filing date respectively after the 8-K reform. Given that the 8-K reform effectively constraints bundling, this result provide evidence that bundling reduces users' information acquisition after the 8-K reform. However, Column (3) and (4) suggest that in the longer time windows the effect of bundling shrinks to 13% ($=e^{0.142}-1$) and 9% ($=e^{0.096}-1$) respectively, consistent with the bundling effect diminishing in the long-run, as discussed in Table 3. Furthermore, the interaction term *Smoothing*×*Post* is not economically significant, indicating that the 8-K reform does not directly affect users' information acquisition for filing issued by smoothing firms. This finding can be explained by the unchanged patterns of smoothing after the 8-K reform presented in Figure 4, which suggests that the 8-K reform has little impact on smoothing. Overall, Table 4 documents causal evidence that bundling decreases users' information acquisition after the 8-K reform.

[Insert Table 4 about here]

4.3 News Moderation

So far I document that disclosure strategies affect users' information acquisition. Next I study whether the association between disclosure strategies and information acquisition differs for good and bad news.

I classify an 8-K as bad news if it conveys negative sentiment overall (Tone < 0) and good news otherwise. I measure news by disclosure tone rather than market returns because managers choose disclosure strategies conditional on news *before knowing the market reaction to the news*. Disclosure tone conveys ex-ante managerial perspective of the news, not the ex-

post market perspective of the news, which is formed after users' acquisition and integration of information. Then I estimate Equation (1) separately for the good news and bad news 8-K subsamples.

Table 5 presents the results of Equation (1) by news and reveals three main findings. First, the signs of the coefficients of *Smooth* and *Bundle* within good and bad news subsamples are consistent with those in Table 3, confirming the previous finding within different news types. Second, the positive coefficients in even columns, except for the economically negligible one in Column 8 for bundling, indicate that strategic bad news 8-Ks are associated with more downloads than non-strategic bad news 8-Ks, suggesting that users acquire more bad news when it is disclosed strategically via bundling or smoothing. Also, comparing between the two strategies in disclosing bad news, smoothing has a stronger positive effect on downloads than bundling, consistent with smoothing reducing the effect of disclosure overload. Third, within the smoothed 8-K subsample, smoothing has a stronger positive effect on downloads for bad news than for good news across all time windows. However, within the bundled 8-K subsample, bundling has a stronger positive effect on downloads for good news on the filing date and within 3 days, but the relation reverses in longer time windows. These results suggest that in the short-run, bundling attracts users' information acquisition of both types of news overall and this effect is more pronounced for good news. However, in the long-run, users have higher information demand for bad news in general. They are able to identify and are willing to acquire bad news disclosures more than good news regardless of the disclosure strategies employed by the firms.

[Insert Table 5 about here]

5 Additional Analyses

5.1 Market Reactions to Disclosure Strategies

This section explores how market reacts to disclosure strategies and whether the reactions are moderated by users' information acquisition. To measure market reactions to the news releases, I calculate the cumulative abnormal returns within X days since filing date (CARX)

using Eventus data. Table 6 presents the cumulative abnormal returns after 8-K releases. Bad news 8-Ks are those that stimulate below-median cumulative abnormal returns on the filing date, and good news otherwise. The overall distributions of CARX are all close to normal, with skewness to the left. Column 7 and Column 9 indicate that the CAR on the filing date is more positive (+0.08 and +0.21) when news is disclosed strategically rather than not, and this effect of disclosure strategies is mainly driven by good news (+0.07 and +0.16). In addition, the short-term positive effect of bundling is almost twice as that of smoothing. However, the long-term CARs are significantly more negative for strategic disclosures comparing to non-strategic disclosures. The univariate analysis of cumulative abnormal returns after 8-K releases suggests that the disclosure strategies are effective in boosting positive market reactions to good news on the news release date, but in the long-run they are associated with worse market reactions for both good and bad news. Consistent with Segal and Segal (2016), this evidence also suggests that firms fail to camouflage bad news through disclosure strategies, as the negative impact of bad news is only slightly attenuated on the filing date (+0.01 and +0.01) and significantly magnified in the long-run (-1.12 and -1.75) through disclosure strategies.

[Insert Table 6 about here]

To control for other confounding factors that could affect market reactions but are not considered in the univariate analysis, next I study the association between disclosure strategies and market reactions using Equation (1) and Equation (3) below.

$$CARX = \beta_0 + \beta_1 DisStr + \beta_2 LogReqX + \beta_1 DisStr \times LogReqX + \sum \beta_n CONTROLS + \epsilon \quad (3)$$

Table 7 presents the regression results of Equation (1) and Equation (3) by news. Odd columns indicate that disclosure strategies are associated with positive abnormal returns on the filing date and within intermediate periods without considering the effect of users' information acquisition. The coefficients of *LogReqX* in even columns indicate that filing downloads are also positively associated with cumulative abnormal returns, and this association is robust across news and time windows, suggesting that information acquisition constitutes an important channel through which the market reactions materialize. Moreover,

the positive coefficients of the interaction terms for all news suggest that disclosure strategies are associated with more positive market reactions when they attract more filing downloads. This moderation effect of information acquisition is driven by good news on filing date and within intermediate periods. Bad news disclosures are associated with more positive abnormal returns on filing date and within intermediate periods when they are smoothed. However, I find no evidence that information acquisition influences the association between disclosure strategies and market reactions for bad news disclosures.

[Insert Table 7 about here]

6 Conclusions

I study how firms' disclosure strategies affect users' information acquisition. Firms can decrease or increase the amount of information simultaneously disclosed to the market by smoothing or bundling disclosures, which influences users' decisions to acquire information and ultimately impacts on market reactions. Using non-earnings 8-Ks from 2003 to 2017, I find that smoothing increases information acquisition. Bundling boosts short-term information acquisition but reduces long-term information acquisition. The results are consistent with smoothing mitigating the negative consequences of disclosure overload. To address the endogeneities concerning firms' choices to employ disclosure strategies, I exploit the 8-K reform in 2004 as a potential exogenous shock that constraints bundling. The results provide causal evidence that bundling decreases information acquisition after the 8-K reform and such effect diminishes in the long-run. In addition, strategic bad news disclosures are associated with higher information acquisition than non-strategic bad news disclosures, suggesting that firms fail to conceal bad news through strategic disclosures. Furthermore, the market reacts more positively to strategic disclosures with higher downloads, indicating that the effectiveness of disclosure strategies is influenced by users' information acquisition.

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Figure 1: Time Trends of Accumulative 8-K Downloads

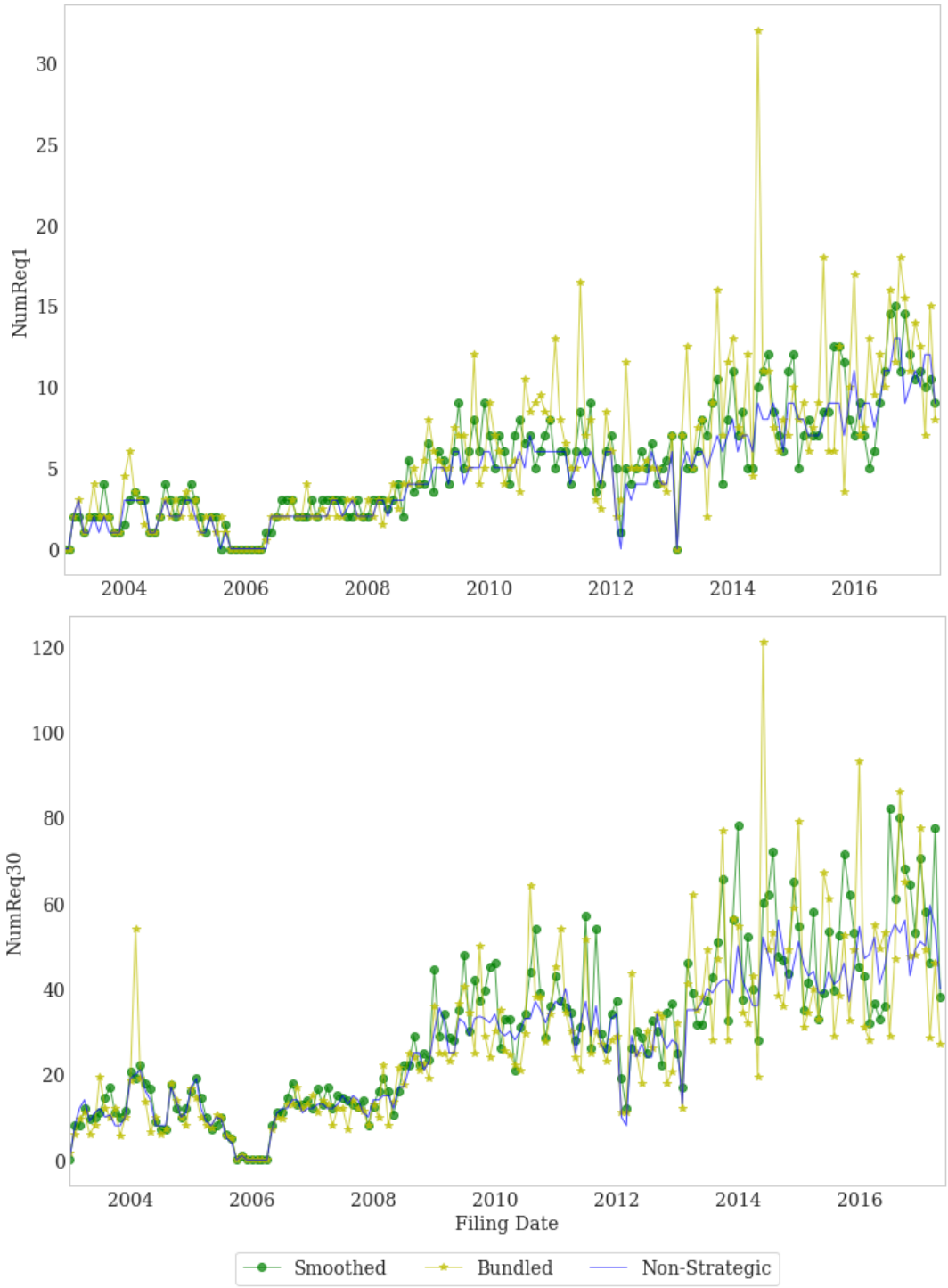
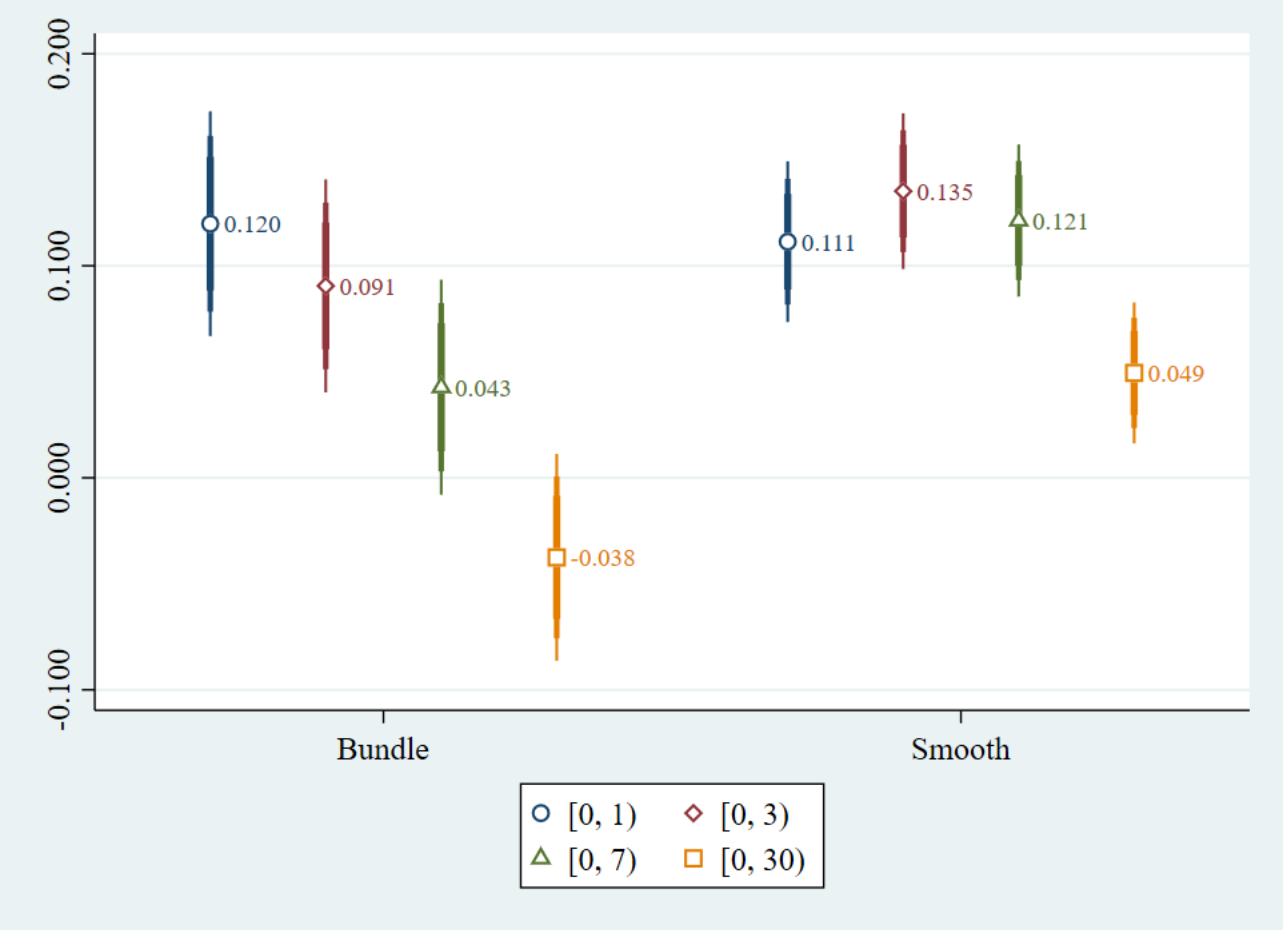


Figure 1 illustrates the median of accumulative downloads within 1 day (above) and 30 (below) days since filing date by disclosure strategies across time. The Y axis depicts the median of accumulative downloads (NumReq30 and NumReq1) for all 8-Ks filed in the same year-month. The X axis depicts the filing date in year-month.

Figure 2: Association between Disclosure Strategies and EDGAR Filing Downloads



$$LogReqX = \beta_0 + \beta_1 DisStr + \sum \beta_n CONTROLS + \epsilon \quad (1)$$

Figure 2 plots the coefficients and their corresponding confidence intervals at 99.9%, 99% and 95% levels of disclosure strategies in Equation (1) across various periods. All regressions include firm and year-month fixed effects and standard errors are clustered at firm level.

Figure 3: Distribution of 8-K filings Around the 8-K Reform

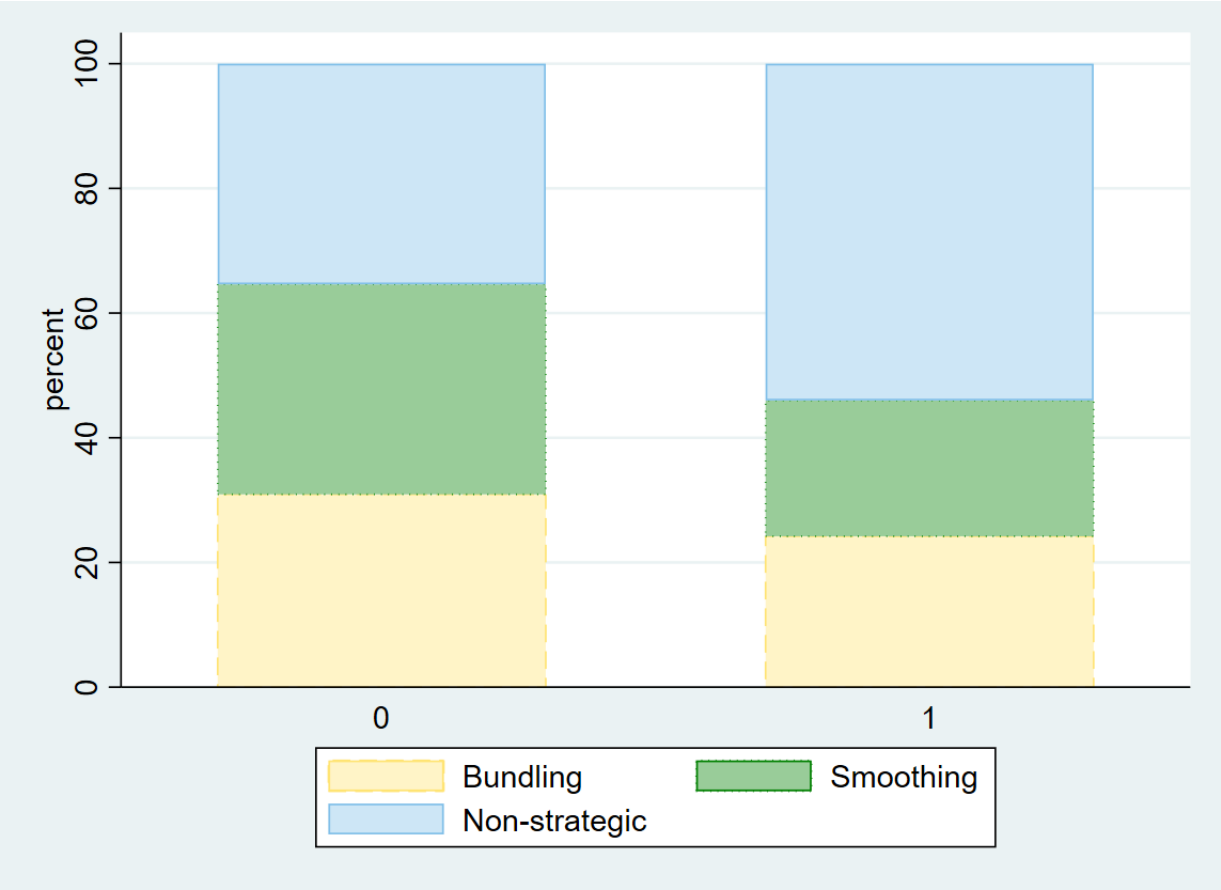


Figure 3 depicts the distribution of 8-K filings issued by non-strategic and strategic firms one year before and after the 8-K reform on August 23, 2004. Smoothing (bundling) firms are firms that have ever employed disclosure smoothing (bundling) before the 8-K reform.

Figure 4: Parallel Trends

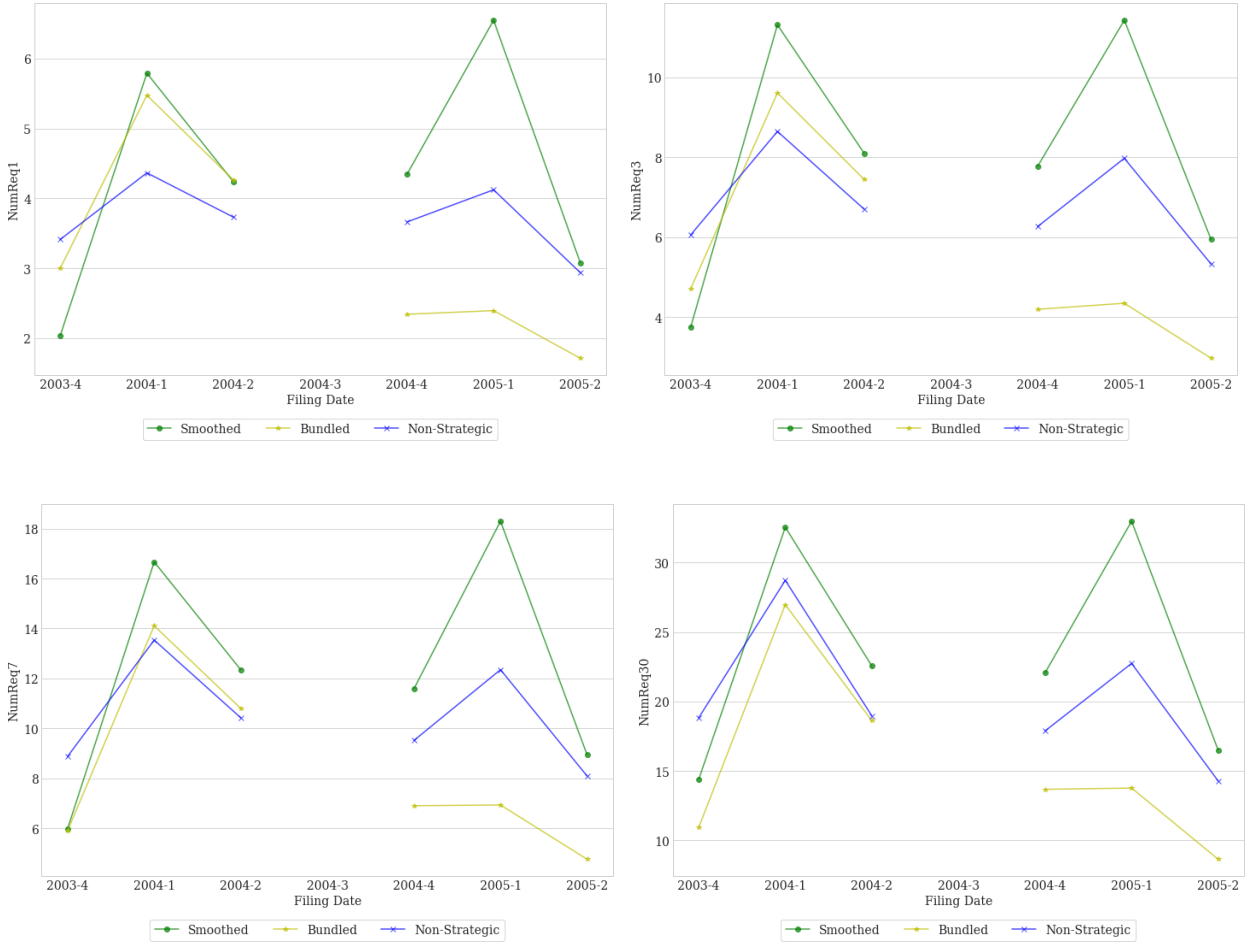


Figure 4 presents the average accumulative downloads within 1/3/7/30 days since filing date for reports issued by strategic (treated) and non-strategic (control) firms, within three quarters before and after the 8-K reform on August 23, 2004. Strategic (non-strategic) firms are those that have ever (never) employed bundling or smoothing strategies before the 8-K reform. The Y axis depicts the mean of accumulative downloads (NumReqX) for all 8-Ks filed in the same year-quarter. The X axis depicts the filing date in year-quarter.

Table 1: Sample Selection

	8-K filings	Firms
Total 8-Ks from 2003-Jan-1 to 2017-May-30	1,168,904	27,845
(-) Filings containing Item 12 or Item 2.02: Results of Operations	(275,595)	
Total non-earnings 8-Ks	893,309	27,817
(-) Filings issued in firm-years without any strategic disclosures	(603,725)	
Total non-earnings 8-Ks issued by firms with history of strategic disclosure	289,584	10,140
Merged with EDGAR log file data	289,584	10,140
Merged with Compustat	204,216	6,314
Merged with I/B/E/S	103,609	3,132
Merged with Thomson Reuters 13F	91,048	2,821
(-) Filings issued by utility and financial firms	(25,931)	
(-) Filings issued by firms with negative or missing beginning book value of equity	(4,453)	
(-) Filings that contain less than 155 words (one percentile)	(596)	
(-) Filings that are classified as both bundled and smoothed	(338)	
Final sample	**59,730**	**2,118**

Table 2: Panel A - Summary Statistics of Full Sample

Variable	N	Mean	S.D.	Min	p25	Median	p75	Max
NumReq1	59,730	7.05	23.67	0	1	3	7	3056
NumReq3	59,730	14.93	198.18	0	3	7	15	47565
NumReq7	59,730	21.17	219.74	0	5	11	23	52371
NumReq30	59,730	35.62	242.90	0	9	20	40	57157
Smooth	59,730	0.13	0.33	0	0	0	0	1
Bundle	59,730	0.07	0.26	0	0	0	0	1
NumWord	59,730	564.30	940.33	155	285	383	601	58642
NumItem	59,730	1.96	0.83	1	1	2	2	9
Tone	59,730	-0.71	7.99	-79.60	-3.98	0.00	3.80	47.21
Fog	59,730	20.14	4.99	7.31	16.92	19.46	22.50	94.91
VolDisc	59,730	0.58	0.49	0.00	0.00	1.00	1.00	1.00
Weekday	59,730	3.04	1.39	1.00	2.00	3.00	4.00	5.00
ATH	59,730	0.66	0.47	0.00	0.00	1.00	1.00	1.00
Size	59,676	7.11	1.92	0.63	5.76	7.03	8.33	12.94
BTM	59,676	0.53	0.69	0.00	0.23	0.39	0.64	28.24
Lev	57,657	0.23	0.19	0.00	0.05	0.22	0.36	0.92
Earn	59,620	-0.01	0.09	-1.25	-0.01	0.01	0.02	2.19
AnaCov	59,730	2.03	0.79	0.69	1.39	2.08	2.64	3.95
InsOwn	59,730	0.68	0.30	0.00	0.50	0.74	0.89	1.49

Table 2 Panel A presents the descriptive statistics of key variables for full sample. *NumReqX* is the number of accumulative human downloads within X days since the filing date (Ryans, 2017). *Smooth* is the smoothed filing indicator which is set to 1 if the 8-K shares the same event date but different filing date with other 8-Ks, and 0 otherwise. *Bundle* is the bundled filing indicator which is set to 1 if the 8-K shares the same filing date but different event date with other 8-Ks, and 0 otherwise. *NumWord* is the number of total words of the 8-K main report. *NumItem* is the number of total 8-K items in the 8-K filing. *Tone* is the number of net positive words per thousand total words using the LM dictionary. *Fog* is the Gunning Fog index of the 8-K main report. *VolDisc* is the voluntary disclosure indicator which is set to 1 if the 8-K contains any voluntary 8-K items (He & Plumlee, 2020). *Weekday* is the weekday on which the 8-K is filed, where Monday to Friday are denoted by 1 to 5 accordingly. *ATH* is the after-trading-hour indicator which is set to 0 if the 8-K is filed during trading hours (9am - 16pm), and 1 otherwise. *Size* is the natural logarithm of market value of equity at the beginning of the quarter. *BTM* is the book-to-market ratio. *Lev* is the leverage ratio. *Earn* is the quarterly earnings. *AnaCov* is the analyst coverage. *InsOwn* is the percentage of common shares held by institutional investors at fiscal year-end. See detailed variable definitions in Appendix A.

Table 2: Panel B - Summary Statistics by Disclosure Strategy

	Smoothed (N = 7,502)		Bundled (N = 4,452)		Non-strategic (N = 47,776)		Diff. in Mean			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Variable	Mean	Median	Mean	Median	Mean	Median	(1) - (5)	t-stat	(3) - (5)	t-stat
NumReq1	7.96	4.00	7.99	4.00	6.82	3.00	1.14	3.81	1.17	3.05
NumReq3	16.43	9.00	15.10	7.00	14.67	7.00	1.76	0.69	0.43	0.13
NumReq7	23.19	13.00	20.49	11.00	20.91	11.00	2.28	0.80	-0.42	-0.12
NumReq30	37.88	22.00	32.96	18.00	35.51	20.00	2.37	0.76	-2.55	-0.63
NumWord	674.77	424.00	573.18	383.00	546.12	377.00	128.65	10.91	27.06	1.98
Tone	-1.15	0.00	-1.25	0.00	-0.59	0.98	-0.56	-5.71	-0.66	-5.29
Fog	20.35	19.62	20.08	19.47	20.11	19.44	0.24	3.92	-0.03	-0.31
VolDisc	0.51	1.00	0.58	1.00	0.59	1.00	-0.08	-12.43	-0.01	-1.14
Weekday	3.06	3.00	3.02	3.00	3.03	3.00	0.03	1.57	-0.01	-0.89
ATH	0.67	1.00	0.67	1.00	0.66	1.00	0.01	1.25	0.01	1.32
Size	7.14	7.06	7.04	7.02	7.12	7.03	0.02	1.17	-0.08	-2.68
BTM	0.51	0.40	0.54	0.38	0.54	0.39	-0.03	-2.55	0.00	0.14
Lev	0.22	0.20	0.22	0.21	0.24	0.22	-0.02	-5.06	-0.02	-5.07
Earn	-0.01	0.01	-0.01	0.01	-0.01	0.01	0.00	3.32	0.00	1.11
AnaCov	2.06	2.08	2.00	2.08	2.03	2.08	0.03	3.09	-0.03	-2.51
InsOwn	0.69	0.75	0.68	0.74	0.67	0.74	0.02	3.43	0.01	0.28

Table 2 Panel B presents the mean and median of key variables by disclosure strategies. Columns 1, 3 and 5 (Columns 2, 4 and 6) present the mean (median) of key variables for smoothed, bundled and non-strategic groups. Column 7 (Column 9) presents the differences in mean for key variables between the smoothed (bundled) filings and non-strategic filings, and Column 8 (Column 10) displays their corresponding t-statistics. Smoothed filing are those that share the same event date but different filing date with other 8-Ks, and 0 otherwise. Bundled filing are those that share the same filing date but different event date with other 8-Ks, and 0 otherwise. Non-strategic filings are those that are not smoothed or bundled. *NumReqX* is the number of accumulative human downloads within X days since the filing date (Ryans, 2017). *NumWord* is the number of total words of the 8-K main report. *NumItem* is the number of total 8-K items in the 8-K filing. *Tone* is the number of net positive words per thousand total words using the LM dictionary. *Fog* is the Gunning Fog index of the 8-K main report. *VolDisc* is the voluntary disclosure indicator which is set to 1 if the 8-K contains any voluntary 8-K items (He & Plumlee, 2020). *Weekday* is the weekday on which the 8-K is filed, where Monday to Friday are denoted by 1 to 5 accordingly. *ATH* is the after-trading-hour indicator which is set to 0 if the 8-K is filed during trading hours (9am - 16pm), and 1 otherwise. *Size* is the natural logarithm of market value of equity at the beginning of the quarter. *BTM* is the book-to-market ratio. *Lev* is the leverage ratio. *Earn* is the quarterly earnings. *AnaCov* is the analyst coverage. *InsOwn* is the percentage of common shares held by institutional investors at fiscal year-end. See detailed variable definitions in Appendix A.

Table 3: Disclosure Strategies and Information Acquisition

Accum. Req. Periods	[0, 1)		[0, 3)		[0, 7)		[0, 30)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Smooth	0.131	0.098	0.165	0.118	0.160	0.108	0.108	0.047
	(10.95)	(9.65)	(12.58)	(12.34)	(11.67)	(11.59)	(7.65)	(5.47)
Bundle	0.100	0.116	0.073	0.091	0.032	0.048	-0.037	-0.022
	(6.69)	(8.10)	(4.40)	(6.66)	(1.83)	(3.52)	(-2.08)	(-1.73)
Smooth = Bundle	(2.80)	(1.16)	(21.60)	(2.80)	(38.04)	(14.30)	(45.69)	(22.94)
Tone	-0.010	-0.008	-0.012	-0.009	-0.013	-0.010	-0.015	-0.010
	(-19.78)	(-13.00)	(-22.16)	(-17.78)	(-23.52)	(-19.33)	(-24.84)	(-20.56)
Fog	0.021	0.004	0.025	0.004	0.024	0.004	0.023	0.004
	(25.81)	(3.96)	(28.16)	(4.13)	(26.32)	(4.16)	(23.86)	(4.61)
VolDisc	0.105	0.109	0.051	0.046	0.039	0.030	0.019	0.015
	(12.95)	(11.83)	(5.75)	(5.34)	(4.20)	(3.74)	(2.00)	(2.08)
Friday	-0.268	-0.221	-0.591	-0.541	-0.095	-0.043	-0.099	-0.045
	(-20.91)	(-22.84)	(-41.92)	(-55.52)	(-6.49)	(-4.87)	(-6.56)	(-5.71)
ATH	0.139	-0.075	0.296	0.037	0.318	0.051	0.321	0.049
	(16.65)	(-8.55)	(32.19)	(4.70)	(33.17)	(6.76)	(32.47)	(6.42)
Size	0.087	0.044	0.114	0.044	0.123	0.050	0.128	0.061
	(26.75)	(2.40)	(32.04)	(2.45)	(33.18)	(2.68)	(33.45)	(3.10)
BTM	0.122	0.052	0.159	0.063	0.181	0.068	0.202	0.079
	(20.58)	(4.29)	(24.30)	(5.26)	(26.50)	(5.20)	(28.76)	(5.51)
Lev	0.460	0.063	0.528	0.062	0.571	0.090	0.624	0.145
	(22.03)	(0.72)	(23.00)	(0.69)	(23.81)	(1.00)	(25.27)	(1.63)
Earn	-0.652	-0.062	-0.748	-0.136	-0.776	-0.192	-0.808	-0.268
	(-13.63)	(-0.94)	(-14.21)	(-2.04)	(-14.13)	(-2.75)	(-14.28)	(-3.66)
AnaCov	0.171	0.023	0.174	0.005	0.187	0.004	0.216	0.007
	(22.14)	(1.25)	(20.53)	(0.25)	(21.04)	(0.19)	(23.63)	(0.37)
InsOwn	-0.162	-0.053	-0.228	-0.041	-0.235	-0.050	-0.210	-0.050
	(-10.96)	(-0.81)	(-13.98)	(-0.59)	(-13.78)	(-0.73)	(-11.97)	(-0.74)
Constant	-0.028	1.069	0.284	1.725	0.388	1.890	0.840	2.336
	(-1.07)	(6.98)	(9.89)	(11.56)	(12.97)	(12.33)	(27.22)	(14.59)
Observations	57,493	57,449	57,493	57,449	57,493	57,449	57,493	57,449
Adjusted R-squared	0.124	0.573	0.170	0.708	0.149	0.745	0.157	0.808
Year-month FE	NO	YES	NO	YES	NO	YES	NO	YES
Firm FE	NO	YES	NO	YES	NO	YES	NO	YES
Clustered SE	NO	YES	NO	YES	NO	YES	NO	YES

$$LogReqX = \beta_0 + \beta_1 Smooth + \beta_2 Bundle + \sum_{n=1}^{n} \beta_n CONTROLS + \epsilon \quad (1)$$

Table 3 presents the regression results of Equation (1). *LogReqX* is the natural logarithm of one plus the of accumulative human downloads within X days since the filing date (NumReqX). *Smooth (Bundle)* is an indicator set to 1 if the 8-K is smoothed (bundled), and 0 if it is non-strategic. CONTROLS denotes a vector of control variables. The row "Smooth = Bundle" presents the F statistic of Wald tests for the null hypothesis "*Smooth = Bundle*". See Appendix A for detailed variable definitions. Even columns include firm and year-month fixed effects and standard errors are clustered at firm level. T-statistics are reported in parentheses.

Table 4: Disclosure Strategies and Information Acquisition Around 8-K Reform

Accum. Req. Periods	(1) [0, 1)	(2) [0, 3)	(3) [0, 7)	(4) [0, 30)
Smooth	0.103	0.117	0.111	0.147
	(1.34)	(1.32)	(1.18)	(1.65)
Bundle	0.105	0.071	0.027	0.000
	(0.87)	(0.56)	(0.22)	(0.00)
Post	0.831	0.775	0.660	0.622
	(5.17)	(5.32)	(4.27)	(4.52)
Smooth×Post	-0.021	-0.006	0.002	0.023
	(-0.32)	(-0.07)	(0.02)	(0.26)
Bundle×Post	-0.213	-0.201	-0.142	-0.096
	(-2.45)	(-2.21)	(-1.64)	(-0.99)
Observations	4,394	4,394	4,394	4,394
Adjusted R-squared	0.239	0.339	0.345	0.450
Year-month FE	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES
Clustered SE	YES	YES	YES	YES
Controls	YES	YES	YES	YES

$$LogReqX_{i,t} = \beta_0 + \beta_1 DisStr_j + \beta_2 Post_t + \beta_3 DisStr_j \times Post_t + \sum \beta_n CONTROLS_{i,t} + \epsilon_{i,t} \quad (3)$$

Table 4 presents the regression results of Equation (2). $LogReqX_{i,t}$ is the natural logarithm of one plus the of accumulative human downloads within X days since the filing date (NumReqX) for filing i at time t. $DisStr_j$ is an indicator for firm j's disclosure strategies which is set to 1 if the 8-K is issued by a smoothing (bundling) firm, and 0 if it is issued by a non-strategic firm. Smoothing (bundling) firms are firms that have ever employed disclosure smoothing (bundling) before the 8-K reform. $Post_t$ is an indicator for time which is set to 1 if the 8-K is issued in the post-reform period and 0 otherwise. $CONTROLS_{i,t}$ denotes a vector of control variables for filing i at time t, including *Tone, Fog, VolDisc, Friday, ATH, Size, BTM, Lev, Earn, AnaCov* and *InsOwn*. *Tone* is the number of net positive words per thousand total words using the LM dictionary. *Fog* is the Gunning Fog index of the 8-K main report. *VolDisc* is the voluntary disclosure indicator which is set to 1 if the 8-K contains any voluntary 8-K items (He & Plumlee, 2020). *Weekday* is the weekday on which the 8-K is filed, where Monday to Friday are denoted by 1 to 5 accordingly. *ATH* is the after-trading-hour indicator which is set to 0 if the 8-K is filed during trading hours (9am - 16pm), and 1 otherwise. *Size* is the natural logarithm of market value of equity at the beginning of the quarter. *BTM* is the book-to-market ratio. *Lev* is the leverage ratio. *Earn* is the quarterly earnings. *AnaCov* is the analyst coverage. *InsOwn* is the percentage of common shares held by institutional investors at fiscal year-end. See Appendix A for detailed variable definitions. All regressions include industry and year-month fixed effects and standard errors are clustered at industry level. T-statistics are reported in parentheses.

Table 5: Disclosure Strategies and Information Acquisition Moderated by News

Accum. Req. Periods	[0, 1)		[0, 3)		[0, 7)		[0, 30)	
News	Good (1)	Bad (2)	Good (3)	Bad (4)	Good (5)	Bad (6)	Good (7)	Bad (8)
Smooth	0.088	0.114	0.105	0.133	0.090	0.124	0.017	0.082
	(7.29)	(7.40)	(9.33)	(8.94)	(8.31)	(8.72)	(1.70)	(6.31)
Bundle	0.123	0.111	0.097	0.084	0.045	0.055	-0.032	-0.004
	(7.82)	(4.78)	(6.36)	(4.03)	(2.94)	(2.61)	(-2.24)	(-0.24)
Observations	36,820	20,412	36,820	20,412	36,820	20,412	36,820	20,412
Adjusted R-squared	0.575	0.571	0.711	0.705	0.748	0.739	0.814	0.798
Year-month FE	YES	YES	YES	YES	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES	YES	YES	YES	YES
Clustered SE	YES	YES	YES	YES	YES	YES	YES	YES
Controls	YES	YES	YES	YES	YES	YES	YES	YES

$$LogReqX = \beta_0 + \beta_1 Smooth + \beta_2 Bundle + \sum_{n=1}^{n} \beta_n CONTROLS + \epsilon \quad (1)$$

Table 5 presents the regression results of Equation (1) by news. An 8-K is classified as bad news if it conveys negative sentiment overall (Tone < 0) and good news otherwise. *LogReqX* is the natural logarithm of one plus the of accumulative human downloads within X days since the filing date (NumReqX). *Smooth (Bundle)* is an indicator set to 1 if the 8-K is smoothed (bundled), and 0 if it is non-strategic. CONTROLS denotes a vector of control variables including *Tone, Fog, VolDisc, Friday, ATH, Size, BTM, Lev, Earn, AnaCov* and *InsOwn*. *Tone* is the number of net positive words per thousand total words using the LM dictionary. *Fog* is the Gunning Fog index of the 8-K main report. *VolDisc* is the voluntary disclosure indicator which is set to 1 if the 8-K contains any voluntary 8-K items (He & Plumlee, 2020). *Weekday* is the weekday on which the 8-K is filed, where Monday to Friday are denoted by 1 to 5 accordingly. *ATH* is the after-trading-hour indicator which is set to 0 if the 8-K is filed during trading hours (9am - 16pm), and 1 otherwise. *Size* is the natural logarithm of market value of equity at the beginning of the quarter. *BTM* is the book-to-market ratio. *Lev* is the leverage ratio. *Earn* is the quarterly earnings. *AnaCov* is the analyst coverage. *InsOwn* is the percentage of common shares held by institutional investors at fiscal year-end. See Appendix A for detailed variable definitions. All regressions include firm and year-month fixed effects and standard errors are clustered at firm level. T-statistics are reported in parentheses.

Table 6: Cumulative Abnormal Returns After 8-K Releases

	Smoothed (N = 7,442)		Bundled (N = 4,435)		Non-strategic (N = 47,401)		Diff. in Mean			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Time Window	Mean	Median	Mean	Median	Mean	Median	(1) - (5)	t-stat	(3) - (5)	t-stat
All News (N = 59,278)										
$[0, 1)$	-0.67	-0.71	-0.54	-0.57	-0.75	-0.76	0.08	4.51	0.21	10.26
$[0, 3)$	-2.25	-2.25	-1.98	-1.96	-2.39	-2.37	0.14	2.97	0.41	7.19
$[0, 7)$	-5.86	-5.61	-5.34	-5.24	-5.89	-5.76	0.03	0.33	0.55	4.35
$[0, 30)$	-28.44	-27.20	-26.46	-25.78	-26.81	-26.06	-1.63	-3.99	0.35	0.66
Good News (N = 29,639)										
$[0, 1)$	0.29	0.02	0.38	0.12	0.22	-0.01	0.07	4.51	0.16	8.72
$[0, 3)$	0.22	-0.28	0.34	-0.19	0.18	-0.34	0.04	0.96	0.16	3.19
$[0, 7)$	-0.68	-1.59	-0.46	-1.46	-0.39	-1.43	-0.29	-3.02	-0.07	-0.65
$[0, 30)$	-9.06	-11.53	-8.22	-11.76	-5.43	-8.88	-3.63	-8.49	-2.79	-5.35
Bad News (N = 29,639)										
$[0, 1)$	-1.68	-1.42	-1.68	-1.39	-1.69	-1.44	0.01	0.59	0.01	0.36
$[0, 3)$	-4.84	-4.22	-4.89	-4.25	-4.88	-4.27	0.04	0.92	-0.01	-0.16
$[0, 7)$	-11.27	-9.98	-11.46	-10.04	-11.25	-9.93	-0.02	-0.20	-0.21	-1.42
$[0, 30)$	-48.71	-42.47	-49.34	-43.38	-47.59	-41.99	-1.12	-2.37	-1.75	-2.81

Table 6 presents the mean and median of cumulative abnormal returns by disclosure strategies and news. Columns 1, 3 and 5 (Columns 2, 4 and 6) present the mean (median) of CARXs for smoothed, bundled and non-strategic groups. Column 7 (Column 9) presents the differences in mean for CARXs between the smoothed (bundled) filings and non-strategic filings, and Column 8 (Column 10) displays their corresponding t-statistics. Smoothed filing are those that share the same event date but different filing date with other 8-Ks, and 0 otherwise. Bundled filing are those that share the same filing date but different event date with other 8-Ks, and 0 otherwise. Non-strategic filings are those that are not smoothed or bundled. An 8-K is classified as bad news if the cumulative abnormal return on the filing date is below median, otherwise it is classified as good news. Cumulative abnormal returns are the sum of market-adjusted daily abnormal returns within X days since the filing date.

Table 7: Cumulative Abnormal Returns and Disclosure Strategies

Dep. Vars.	(1) CAR1	(2) CAR1	(3) CAR3	(4) CAR3	(5) CAR7	(6) CAR7	(7) CAR30	(8) CAR30
All News (N = 57,008)								
Smooth	0.154	0.041	0.377	0.086	0.590	0.184	0.696	-0.067
	(10.80)	(1.72)	(10.45)	(1.21)	(8.37)	(1.17)	(3.02)	(-0.11)
Bundle	0.235	0.138	0.452	0.196	0.672	0.363	0.991	0.497
	(10.08)	(3.74)	(9.08)	(1.95)	(6.91)	(1.47)	(3.10)	(0.53)
LogReqX		0.244		0.743		1.521		4.976
		(25.37)		(27.19)		(24.59)		(16.66)
Smooth×LogReqX		0.056		0.094		0.096		0.176
		(4.22)		(3.28)		(1.78)		(0.95)
Bundle×LogReqX		0.044		0.091		0.099		0.210
		(2.33)		(2.15)		(1.12)		(0.74)
Adjusted R-squared	0.584	0.601	0.680	0.697	0.738	0.751	0.807	0.814
Good News (N = 28,238)								
Smooth	0.141	-0.016	0.330	-0.093	0.470	-0.158	0.262	-0.590
	(8.73)	(-0.60)	(7.91)	(-1.15)	(5.81)	(-0.94)	(0.96)	(-0.84)
Bundle	0.196	0.070	0.336	0.034	0.453	0.096	0.321	0.406
	(8.72)	(1.93)	(6.53)	(0.32)	(4.39)	(0.39)	(0.89)	(0.45)
LogReqX		0.208		0.670		1.358		4.337
		(20.18)		(21.86)		(18.91)		(11.87)
Smooth×LogReqX		0.077		0.141		0.171		0.184
		(5.24)		(4.46)		(2.99)		(0.92)
Bundle×LogReqX		0.058		0.101		0.102		-0.047
		(3.05)		(2.33)		(1.16)		(-0.17)
Adjusted R-squared	0.397	0.432	0.530	0.565	0.631	0.655	0.751	0.761
Bad News (N = 28,462)								
Smooth	0.028	0.045	0.150	0.179	0.249	0.342	0.122	-0.195
	(2.24)	(2.05)	(4.19)	(2.32)	(3.15)	(1.76)	(0.42)	(-0.24)
Bundle	0.055	0.038	0.120	0.027	0.128	-0.009	-0.398	-1.621
	(1.77)	(0.82)	(1.97)	(0.21)	(0.97)	(-0.03)	(-0.85)	(-1.10)
LogReqX		0.066		0.286		0.691		2.555
		(8.39)		(12.11)		(13.07)		(9.96)
Smooth×LogReqX		-0.014		-0.024		-0.058		0.103
		(-1.21)		(-0.78)		(-0.86)		(0.42)
Bundle×LogReqX		0.010		0.045		0.064		0.522
		(0.47)		(0.87)		(0.52)		(1.16)
Adjusted R-squared	0.530	0.531	0.631	0.634	0.682	0.686	0.753	0.755

$$CARX = \beta_0 + \beta_1 DisStr + \sum \beta_n CONTROLS + \epsilon \tag{1}$$

$$CARX = \beta_0 + \beta_1 DisStr + \beta_2 LogReqX + \beta_1 DisStr \times LogReqX + \sum \beta_n CONTROLS + \epsilon \tag{2}$$

Table 7 presents the regression results of Equation (1) and Equation (3). *CARX* is the sum of market-adjusted daily abnormal returns within X days since the filing date. *LogReqX* is the natural logarithm of one plus the of accumulative human downloads within X days since the filing date (NumReqX). *DisStr* is an indicator for disclosure strategies which is set to 1 if the 8-K is smoothed (bundled), and 0 if it is non-strategic. An 8-K is classified as bad news if the cumulative abnormal return on the filing date is below median, otherwise it is classified as good news. CONTROLS denotes a vector of control variables including *Tone, Fog, VolDisc, Friday, ATH, Size, BTM, Lev, Earn, AnaCov* and *InsOwn*. See Appendix A for detailed variable definitions. All regressions include firm and year-month fixed effects and standard errors are clustered at firm level. T-statistics are reported in parentheses.

Appendix

Appendix A: Variable Definition

Variable	Definition	Source
	Filing Level Variables	
NumReqX	Number of accumulative human downloads within X days since the filing date	jamesryans.com
Smooth	Smoothed filing indicator, set to 1 if the 8-K shares the same event date but different filing date with other 8-Ks, and 0 otherwise	EDGAR
Bundle	Bundled filing indicator, set to 1 if the 8-K shares the same filing date but different event date with other 8-Ks, and 0 otherwise	EDGAR
DisStr	Disclosure strategies, set to 1 if the 8-K is smoothed (bundled), and 0 if it is non-strategic	EDGAR
VolDisc	Voluntary disclosure, an indicator set to 1 if the 8-K contains any voluntary 8-K items following He and Plumlee (2020)	EDGAR
Weekday	The weekday on which the 8-K is filed, where Monday to Friday are denoted by 1 to 5 accordingly.	EDGAR
ATH	After-trading-hour indicator, set to 0 if the 8-K is filed during trading hours (9am - 16pm), and 1 otherwise	EDGAR
Tone	Tone, defined as the number of net positive words per thousand total words using Loughran and McDonald (2011) dictionary, calculated as the number of positive words minus negative words, minus negations, deflated by total words and multiply the previous result by one thousand	EDGAR
BadNews	Bad news indicator set to 1 if the 8-K conveys negative sentiment overall (Tone < 0) and 0 otherwise	EDGAR
NumWord	Number of total words of the 8-K main report	EDGAR
NumItem	Number of total 8-K items in the 8-K filing	EDGAR
Fog	Fog index of the 8-K main report	EDGAR
	Firm Level Variables	
Size	Firm size, defined as the natural logarithm of market value of equity at the beginning of the quarter, calculated as natural logarithm of beginning-of-quarter common share price (Compustat data item PRCCQ) times beginning-of-quarter common shares outstanding (Compustat data item CSHOQ)	Compustat
BTM	Book-to-market ratio, defined as beginning-of-quarter book value of equity (Compustat data item CEQQ) divided by beginning-of-quarter market value of equity, calculated as common share price (Compustat data item PRCCQ) times common shares outstanding (Compustat data item CSHOQ)	Compustat
Lev	Leverage ratio, defined as beginning-of-quarter short term debt (Compustat data item DLCQ) plus beginning-of-quarter long term debt (Compustat data item DLTTQ) scaled by beginning-of-quarter total assets (Compustat data item ATQ)	Compustat
Earn	Quarterly earnings, defined as quarterly earnings before extraordinary items (Compustat data item IBQ) scaled by beginning-of-quarter total assets (Compustat data item ATQ)	Compustat
AnaCov	Analyst coverage, calculated as the natural logarithm of one plus the number of analysts who provided at least one forecast of next period earnings during the year (lagged I/B/E/S data item NUMEST)	I/B/E/S
InsOwn	Institutional Ownership, defined as the percentage of common shares held by institutional investors at fiscal year-end	Thomson Reuters 13F
CARX	Market-adjusted cumulative abnormal returns, calculated as the sum of market-adjusted daily abnormal returns within X days since the filing date	Eventus

Online Appendix

1 Tables

Table A1: Correlation Matrix 8-K Full Sample

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) NumReq1		0.905	0.867	0.815	0.014	0.039	0.150	0.073	-0.083
(2) NumReq3	0.665		0.951	0.900	0.006	0.048	0.181	0.093	0.099
(3) NumReq7	0.673	0.996		0.955	0.004	0.048	0.196	0.095	0.114
(4) NumReq30	0.690	0.990	0.996		0.020	0.033	0.207	0.098	0.123
(5) Bundle	0.011	0.000	0.001	0.003		0.108	0.001	0.009	0.016
(6) Smooth	0.015	0.003	0.004	0.004	0.108		0.067	0.042	0.035
(7) NumWord	0.049	0.015	0.018	0.026	0.003	0.045		0.320	0.486
(8) NumItem	0.030	0.009	0.013	0.022	0.009	0.050	0.198		0.165
(9) Tone	0.052	0.014	0.017	0.024	0.019	0.021	0.219	0.150	
(10) Fog	0.054	0.010	0.013	0.022	0.003	0.016	0.135	0.123	0.123
(11) VolDisc	0.036	0.000	0.000	0.000	0.001	0.051	0.053	0.123	0.076
(12) ATH	0.053	0.018	0.021	0.028	0.005	0.005	0.042	0.035	0.039
(13) Size	0.129	0.038	0.049	0.072	0.012	0.006	0.010	0.025	0.054
(14) BTM	0.000	0.002	0.002	0.005	0.002	0.011	0.006	0.021	0.074
(15) Lev	0.057	0.062	0.069	0.092	0.019	0.019	0.021	0.030	0.019
(16) Earn	0.013	0.013	0.014	0.016	0.003	0.013	0.011	0.021	0.015
(17) AnaCov	0.123	0.035	0.043	0.064	0.012	0.014	0.013	0.021	0.028
(18) InsOwn	0.007	0.007	0.006	0.003	0.000	0.014	0.014	0.012	0.035

	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
(1) NumReq1	0.139	0.037	0.085	0.232	-0.012	0.152	-0.030	0.248	0.081
(2) NumReq3	0.162	0.013	0.157	0.253	0.009	0.162	0.034	0.261	0.077
(3) NumReq7	0.168	0.003	0.163	0.276	0.002	0.175	0.036	0.283	0.084
(4) NumReq30	0.169	0.012	0.164	0.303	0.005	0.190	0.035	0.313	0.099
(5) Bundle	0.002	0.001	0.005	0.009	0.002	0.017	0.003	0.012	0.001
(6) Smooth	0.018	0.051	0.005	0.006	0.003	0.018	0.022	0.014	0.011
(7) NumWord	0.286	0.255	0.102	0.016	0.024	0.040	0.058	0.032	0.029
(8) NumItem	0.172	0.141	0.023	0.017	0.029	0.028	0.020	0.022	0.020
(9) Tone	0.145	0.110	0.046	0.061	0.074	0.007	0.059	0.033	0.027
(10) Fog		0.167	0.054	0.073	0.045	0.069	0.003	0.077	0.071
(11) VolDisc	0.150		0.023	0.067	0.025	0.044	0.046	0.044	0.008
(12) ATH	0.050	0.023		0.037	0.055	0.016	0.037	0.057	0.032
(13) Size	0.078	0.068	0.035		0.220	0.253	0.411	0.759	0.362
(14) BTM	0.022	0.012	0.028	0.248		0.001	0.162	0.160	0.002
(15) Lev	0.058	0.049	0.028	0.194	0.040		0.039	0.206	0.151
(16) Earn	0.026	0.022	0.020	0.297	0.020	0.051		0.269	0.206
(17) AnaCov	0.079	0.044	0.058	0.742	0.134	0.184	0.192		0.396
(18) InsOwn	0.057	0.005	0.024	0.345	0.067	0.149	0.244	0.421	

Table A1 presents the correlation matrix of key variables. Pearson (Spearman) correlations are exhibited below (above) the diagonal. See detailed variable definitions in Appendix A.

Table A2: Distribution of 8-K Filings Around 8-K Reform

	Before	row %	**After**	row %	**Total**
Non-strategic	627	30.07	1,458	69.93	2,085
column %	35.38		54.02		46.63
Smooth	597	50.38	588	49.62	1,185
column %	33.69		21.79		26.50
Bundle	548	45.63	653	54.37	1,201
column %	30.93		24.19		26.86
Total	1,772		2,699		4,471

Table A2 presents the distribution of 8-K filings issued by non-strategic and strategic firms one year before and after the 8-K reform on August 23, 2004. Smooth (bundle) firms are firms that have ever employed disclosure smoothing (bundling) before the 8-K reform.