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Are managers strategic in reporting non-earnings news? Evidence on timing and news bundling

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Abstract Using a comprehensive sample of non-earnings 8-K filings from 2005 to 2013, we examine whether firms strategically report mandatory and voluntary news. In particular, we examine whether firms report negative news when investor attention is low and whether they bundle positive and negative news. Our findings support the notion that managers believe in the existence of investor inattention and strategically report negative news after trading hours. These results particularly apply to public firms, where equity market pressures provide stronger incentives to mitigate market reaction to news by exploiting investor inattention. Further analysis of the market reaction to strategic disclosure uncovers no evidence of investor inattention, consistent with market efficiency. We also observe that public firms are more likely to strategically disclose through news bundling and that the likelihood of this increases with the likelihood of strategic disclosure through timing.

Keywords SEC regulation · Form 8-K · Voluntary disclosure · Mandatory disclosure · Investor inattention

JEL Classification G14 · G18 · K22 · M41 · M48

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1 Introduction

A major stream of research examines whether managers strategically report earnings news to exploit investor inattention. Theory suggests that managers should report negative earnings news after trading hours or on Fridays, when investor attention is low, to mitigate the negative reaction to the news (Gennotte and Trueman 1996). Empirical research, however, provides mixed evidence concerning the strategic reporting. Several studies find that firms tend to release negative earnings news outside trading hours and on Fridays (Patell and Wolfson 1982; Penman 1987; Damodaran 1989; Bagnoli et al. 2005; DellaVigna and Pollet 2009; DeHaan et al. 2015). Other studies provide evidence that is inconsistent with and even contrary to the investor inattention hypothesis. Doyle and Magilke (2009) show that the sign of earnings news does not affect the timing of disclosure, while Michaely et al. (2014) find that firms are more likely to release negative news *during* trading hours.

An important empirical explanation of the results supporting the strategic disclosure of negative earnings news is that researchers did not exclude from their analyses firms that had adopted constant reporting policies. Doyle and Magilke (2009) and Michaely et al. (2014) find that most firms currently follow a relatively constant disclosure policy of preliminary earnings announcement, regardless of whether earnings provide positive or negative news (i.e., firms report earnings *either* after trading hours or before market opens). This finding contradicts the whole notion of strategic reporting to exploit investor inattention because constant disclosure implies that firms do not alter the timing of negative earnings news. Moreover, most firms report preliminary earnings and typically announce in advance the exact timing of the earnings release. If investors are informed well in advance about the timing of disclosure, then it seems unlikely managers can then attempt to disclose strategically to exploit investor inattention.

Motivated by mixed results with respect to the existence of investor inattention on the one hand and the inherent difficulty of addressing this issue using earnings announcements on the other (given the constant reporting policy and the advance announcement of the date of the earnings release), we examine, through Form 8-K, whether firms strategically report mandatory and voluntary news that does *not* directly relate to earnings. We examine two facets of strategic reporting. The first is the differential timing in disclosure of negative and positive news. In particular, we examine whether negative news is released when investor inattention is low, that is, after trading hours (ATH), on the last trading day of the week (LTD), and after trading hours on the last trading day of the week (ATH on LTD). The second facet we examine is the bundling of positive and negative news.

We focus on the disclosures of Form 8-K, which are used to announce major events of interest to shareholders, while excluding from the analysis 8-K forms that contain information on results of operations (i.e., quarterly or annual earnings). This particular setting holds several benefits. First, the 8-K form provides economically important information (Lerman and Livnat 2010).[1] Second, the form consists of

[1] Examples of reportable items include entry into a material agreement or its termination, bankruptcy or receivership, and material impairments, to name a few. See Sect. 2 for more detail.

several mandatory items and a voluntary items section, allowing us to examine whether the reporting strategy relating to mandatory and voluntary news differs. Third, in contrast to recent earnings release timing trends, 8-K filings that are not related to earnings announcements are, for the most part, idiosyncratic: a largely unexpected event triggers the reporting, and hence the filing of the forms may be subject to strategic reporting. Indeed, the data reveals significant within-firm and even within-firm-item variation in the reporting timing of non-earnings related 8-K forms, suggesting that focusing on non-earnings events provides a powerful setting for examining strategic reporting. Finally, a unique feature of our setting is the use of (and contrast between) public and nonpublic firms to examine how market pressures affect reporting strategy; differences in stock price availability and linkage to litigation and to compensation provide stronger incentives to strategically report information.

While we focus the analysis on the differential timing of disclosure of negative and positive news, we exploit the richness of the data to examine whether firms also bundle news. The model by Gennotte and Trueman (1996) shows that, when managers have two pieces of information, one of which is earnings, they would prefer to disclose them separately (simultaneously) if the earnings news has positive (negative) implications for the firm. Anilowski et al. (2007) and Rogers and Van Buskirk (2013) provide empirical evidence that management forecasts are increasingly bundled with earnings news as a common practice—in as many as 80 % of the cases. The high frequency of bundled management forecasts with the reported actual earnings suggests that firms lock themselves into a policy of providing forecasts, in which case one cannot learn much from the act of providing a forecast. We extend the empirical evidence by examining whether firms strategically report 8-K items by bundling together mandatory and voluntary news in the context of non-earnings related news.[2] Considering the short allowable window for reporting mandatory items (four business days), inclusion of an independent voluntary item with opposite news sign on the same filing could be evidence of strategic bundling.

Using a sample of all non-earnings 8-K reports filed with the SEC from 2005 through 2013, we find evidence supporting the existence of strategic reporting. In particular, we find that firms are more likely to report negative news when investor attention is low. We also find that public and nonpublic firms differ in their reporting strategies, consistent with equity market pressures providing stronger incentives to mitigate market reaction to news by exploiting investor inattention. We obtain similar results when we analyze voluntary and mandatory news separately; firms are more likely to strategically report negative voluntary as well as negative mandatory news.[3]

[2] Firms could try to strategically bundle mandatory items. However, the reporting requirements for mandatory items afford less flexibility (see Sect. 2). Hence we focus on the bundling of mandatory and voluntary items.

[3] One could argue that reporting ATH is consistent with the SEC's effort to provide investors equal access to the information. While plausible, note that the SEC's effort applies to all information, positive or negative. Our finding that negative news is more likely to be reported ATH is therefore more consistent with strategic reporting (i.e., an attempt to exploit investor inattention).

We also find evidence consistent with strategic reporting using news bundling. Specifically, we document that public firms are more likely to engage in news bundling than nonpublic ones, in general, and in news bundling of voluntary and mandatory news with conflicting signs, in particular. Furthermore, we show that firms that are more likely to strategically report through the timing of negative news disclosure are also more likely to strategically report through news bundling.

The results discussed above are consistent with the conjecture that managers behave as if they believe in investor inattention. We next examine whether strategic disclosure of negative news actually mitigates the negative reaction to the news. We find no evidence that strategic reporting of negative news leads to investor under-reaction. The market reaction to negative news is identical whether the news is reported when investor attention is low or high. This result is consistent with market efficiency: in an efficient market, the news should be impounded in price immediately and fully once it is released. If news is disclosed ATH or on LTD, then the reaction to the news should take place on the following trading day. Nevertheless, the results are puzzling. On the one hand, public firms appear to report negative news strategically; on the other, there is no apparent benefit (in the form of lower market reaction) to such a reporting strategy. One possible explanation is that managers do not get feedback on what the effects of the alternative approach would be ("the road not taken"), or that they choose to heed evidence that confirms what they already believe (confirmation bias), thus observing only half of the picture.

This study contributes to the literature on strategic disclosure. Prior research focuses exclusively on the disclosure of earnings news. Given the conflicting evidence related to the strategic reporting of earnings news, on the one hand, and the trend in recent years towards a fixed disclosure policy of earnings news, on the other, our setting allows for clearer inferences about strategic disclosure and its consequences. Using a comprehensive sample of 8-K filings, we can use the characteristics of the forms to test for disclosure strategies along several dimensions of timing. Our findings support the notion that managers engage in strategic disclosure, attempting to delay and hide negative news and mitigate its potential impact on the market. We do not, however, find evidence that reporting ATH achieves the desired effect.

Second, we contribute to the literature on news bundling. The literature on bundling focuses exclusively on management earnings forecasts, and the practice bundling typically involves bundling an earnings announcement together with the forecast. Hence, if companies routinely provide management forecasts with the reported earnings, then it is hard to argue that the management forecast is associated with strategic disclosure. We suggest that companies use other forms of news bundling—in particular, bundling mandatory and voluntary non-earnings news with opposite signs. For the reasons discussed above, our setting potentially provides a more powerful way to identify the presence of bundling; bundling of non-earnings information may be more indicative of strategic disclosure because the news is unexpected. Another related contribution of our study is that we show that reporting strategy through disclosure timing is positively associated with reporting strategy through news bundling.

Third, we show that public and nonpublic firms differ with respect to disclosure strategy, and our findings that public firms are more likely to strategically disclose through timing and bundling support the argument that one incentive for disclosure strategy is the desire to affect observed value.

The remainder of the paper is organized as follows. Section 2 provides the literature review and institutional details regarding Form 8-K and describes the hypotheses. Section 3 describes the data and provides descriptive statistics. Section 4 presents the empirical results, and Sect. 5 concludes.

2 Literature review, Form 8-K, and hypotheses development

2.1 Form 8-K

In addition to filing annual and quarterly reports, SEC registrants must report certain material corporate events on Form 8-K. Events that would trigger an obligation to file Form 8-K include those affecting the registrant's business and operations, financial information, securities and trading markets, and other aspects of the firm. See Appendix 1 for a complete list of events reported on current Form 8-K.

The importance of Form 8-K filings can be gauged by the fact that between 2005 and 2013 both public and nonpublic firms filed close to 580,000 8-Ks, and prior research shows that 8-K filings contain information that has valuation implications. Specifically, Lerman and Livnat (2010) find that disclosed events are associated with economically and statistically significant abnormal volume and equity return. Furthermore, 8-K filings are associated with analyst revisions (Livnat and Zhang 2012) and improved forecast accuracy (Rubin et al. 2016).

Form 8-K includes a unique catch-all category, labeled "Other Events" (Item 8.01). This item is reserved for events which are *not* mandatory to disclose but are considered by the firm to be of importance to security holders. The SEC defines "Other Events" as follows:

> Item 8.01 Other Events "The registrant can use this Item to report events that are not specifically called for by Form 8-K, that the registrant considers to be of importance to security holders."

This SEC definition indicates that firms have complete discretion with respect to the news reported under "Other Events." Reporting is voluntary as there is no official requirement to report nor time window within which to file. Furthermore, since Item 8.01 is designated for voluntary filings, it does not itself imply a duty to disclose for purposes of Section 10(b) or Rule 10b-5 (SEC release 2004). This suggests that the SEC and plaintiffs are effectively prevented from suing firms under anti-fraud statutes for failing to disclose information under "Other Events." Indeed, the small number of legal cases and articles relating to Item 8.01 supports the above conclusion.[4]

[4] In Re Comverse Tech., Inc. and In Re Browning-Ferris Indus. Also see the following law review articles: Beale (2009), Abril and Olazabal (2010), and Steinberg and Goldman (1987).

Given the broad definition of Item 8.01, companies have latitude related to content and timing, resulting in a variety of news reported under this item. In broad terms, untabulated analysis reveals that approximately one quarter of 8.01 category filings relate to shares or debt issuance or repurchases, about half as many relate to dividends or interest payments, and the remainder are miscellaneous announcements relating to litigation matters, other agreements, appointments, and stock dividends or splits, to name a few.

In addition to disclosing voluntary news via Item 8.01, companies may provide voluntary disclosure through other means such as conference calls. Under Regulation FD (Reg FD), once a company makes a voluntary disclosure, such as earnings guidance, it must file an immediate 8-K report containing the voluntary disclosure; Reg FD disclosures are filed under Item 7.01. Hence we label Item 8.01 and Item 7.01 as voluntary news. All other items are classified as mandatory news. The classification of Items 7.01 and 8.01 as voluntary news is consistent with the work of Cooper et al. (2015).

2.2 Strategic reporting through timing of disclosure

Research provides mixed evidence relating to strategic reporting of negative earnings and dividend news through timing of the news release (commonly referred to as the investor inattention hypothesis). Several studies document that firms tend to release negative earnings news ATH (Patell and Wolfson 1982; DeHaan et al. 2015), on Fridays (Penman 1987; Damodaran 1989; Bagnoli et al. 2005; DellaVigna and Pollet 2009), or on busy reporting days (DeHaan et al. 2015), when investors' attention is low.[5] Consistent with lower investor attention on Fridays, DellaVigna and Pollet (2009) document that Friday announcements have a 15 % lower immediate response and a 70 % higher delayed response in comparison to non-Friday announcements. The underreaction on Fridays suggests that managers who aim to maximize short-term value should prefer to release unfavorable announcements on that day.

However, Doyle and Magilke (2009) show that the early evidence related to strategic disclosure of negative earnings news is likely attributed to firms with constant reporting policies. In particular, they observe that firms tend to adopt constant reporting when the firm reports earnings news either after, before, or during trading hours, irrespective of the news. Given that constant reporting cannot be associated with strategic reporting, they restrict the sample to companies that actively switch reporting timing. Using the sample of switchers, they find no evidence of strategic behavior on average; negative earnings news is no more likely to be reported after trading hours than before market opens. Michaely et al. (2014) find results opposite to the investor inattention hypothesis. They find that firms are more likely to release negative news *during* trading hours and that investor reaction to negative news released during trading hours is *lower*. In addition, Michaely et al.

[5] DeHaan et al. (2015) show that investor attention is indeed low ATH, on Fridays, and on busy days. Specifically, they provide evidence that, when earnings are released ATH or on busy reporting days, there are fewer news articles, EDGAR downloads, Google searches and analysts update their forecasts more slowly.

(2015) show that the lower Friday reaction is attributable to the different characteristics of Friday announcing firms (smaller firms with low institutional ownership and few analysts following) and conclude that limited attention does not explain the lower immediate reaction to Friday earnings announcements.

Effective reporting strategy, whereby managers try to hide negative news, requires the following conditions. First, the timing of the news should be by and large unpredictable. Second, there must be variation in the timing of disclosure. Third, managers should believe that the reaction to the news depends on disclosure strategy. These three conditions suggest that earnings announcements provide a limited setting to examine the investor inattention hypothesis. Earnings are probably the most important information disclosed by firms, and they are disclosed quarterly with the announcement date typically known well in advance. The importance of earnings together with advance announcement of the exact release date and time make it difficult to argue that managers believe that they can gain from strategic disclosure of earnings. In fact, the constant reporting of earnings is prima facie evidence that managers do not believe in strategic disclosure of earnings.

In contrast to earnings announcements, disclosure of material events through 8-K filings is unpredictable because the reporting of the news depends on the occurrence of a largely unexpected event.[6] The unpredictability of the news together with its materiality suggest that their reporting could be strategic. Indeed, as we discuss below, the vast majority of firms do switch the reporting of 8-K forms between ATH and all other times and between Friday and all other days. Hence our first hypothesis is:

H1 Firms are more likely to report negative non-earnings news when investor attention is low (after trading hours or on the last trading day of the week).

One of the key aspects of the Gennotte and Trueman (1996) model is the link between corporate disclosure and *observed* firm value; managers aim to maximize the firm's post announcement value and, according to the model, will strategically disclose negative news.[7] Given that the main incentive for strategic disclosure is to maximize post-announcement value, a useful avenue for investigating strategic disclosure is to examine the link to the availability of market prices and, in particular, to compare strategic disclosure of public firms and nonpublic firms. If indeed managers disclose strategically to maximize post-announcement value, then managers of nonpublic firms (whose prices are not readily observable and whose shares are less liquid) face lower incentive to do it and are therefore less likely to.

[6] Although Gennotte and Trueman (1996) use earnings announcements in the discussion of their model, the model is generalizable to any mandatory public announcements (i.e., to non-earnings news as well).

[7] Managers aim to maximize post-announcement share price for reasons related to compensation, job security, and litigation. Specifically, Jayaraman and Milbourn (2012) find that, as stock liquidity increases, the proportion of equity-based (cash) compensation in total compensation increases (decreases). Hence it is likely that managers of public firms receive a greater portion of their compensation in equity-based instruments, leading to greater compensation sensitivity to stock price. Defond and Hung (2004) and others document a link between CEO turnover and poor stock returns. Also, the likelihood of litigation is affected by stock reaction to negative events (see for example, Kim and Skinner 2012).

Furthermore, managers can also mitigate market reaction to negative events by bundling news of opposite signs. Since firms cannot withhold disclosure of material events more than four business days from the occurrence of the event, the bundling strategy is facilitated mainly through voluntary news (e.g., Item 8.01). In particular, firms have latitude with respect to the timing of the voluntary news disclosure and hence can choose which voluntary news to disclose and, importantly, when. Therefore managers who are interested in mitigating market reaction to negative mandatory news can disclose it together with positive voluntary news. Similarly, they can mitigate the reaction to negative voluntary news by bundling the news with positive mandatory news.[8] Hence our next set of hypotheses:

H2a Public firms are more likely to report negative news when investor attention is low (after trading hours or on the last trading day of the week) in comparison to nonpublic firms.

H2b Public firms are more likely to bundle mandatory and voluntary news with opposite expected stock price impact in comparison to nonpublic firms.

The discussion above assumes that public firms report strategically to mitigate market reaction to negative news. A challenge to this hypothesis is that markets are generally considered to be efficient, and therefore the reaction to the news would be immediate and full regardless of when the news is disclosed. The only difference would be the timing of the reaction; that is, if the negative news is disclosed before market opens or during (after) trading hours, then investors will react fully to the news on the same (following) day. Hence our third hypothesis relates strategic reporting to investor reaction:

H3 Reporting of negative news when investor attention is low (after trading hours or on the last trading day of the week) generates lower (in absolute value) stock reaction.

3 Data and descriptive statistics

We download all 8-K filings from the SEC's Electronic Data Gathering, Analysis, and Retrieval online system (EDGAR) filed between the years 2005 and 2013. We choose 2005 as the starting year because the SEC mandated significant changes to

[8] One could argue that managers have no reason to disclose negative voluntary news. However, voluntary news in the context of 8-K filings are material events that are eventually reported in the subsequent periodic 10-Q/K. Given that the news would eventually be released, the firm bears no real cost in disclosing negative voluntary news early. This is similar to management forecasts, which are used as the main proxy for voluntary disclosure. Once managers decide to issue forecasts, they typically do so regularly whether the news is positive or negative. In addition, the literature indicates that less timely disclosure increases firms' litigation consequences (e.g., Skinner 1994; Kasznik and Lev 1995; Skinner 1997, Baginski et al. 2002). For example, Skinner (1994) argues that U.S. securities laws provide incentives for managers to disclose negative news voluntarily. This is because announcements of negative earnings surprises increase the likelihood of shareholder litigation. Early disclosures both reduce the plaintiffs' ability to claim that managers failed to release material information promptly and limit the size of the plaintiff class by reducing the period of nondisclosure.

Form 8-K that became effective in 2004.[9] We machine-read all 8-K filings to extract the filing date and exact time of filing, event date, and registrant's identification details. We further identify all reported items and extract all words. See Appendix 2 for details on the data extraction.

The initial sample consists of 576,912 8-K reports of public and nonpublic firms. Given our focus on non-earnings information, we eliminate all 8-K reports that contain earnings announcements (Item 2.02) and related financial statements (Item 9.01)—128,891 forms in total. We also exclude forms with exhibits only (i.e., there is no news item reported; these are typically financial statements) and forms with filings of Section 6, which contains specialized disclosure requirements that only apply to asset-backed securities. These restrictions reduce the sample by 18,547 forms. We further remove cases where a firm filed multiple 8-K reports in a single day (26,645), forms filed within 3 days of each other (22,541), and forms filed within 3 days of 10-Q or 10-K filing (26,960). The latter restrictions were imposed to allow for accurate assessment of market reaction to the 8-K. In addition, Doyle and Magilke (2009) show that it is critical to eliminate firms that do not switch their disclosure timing. Hence we exclude firms that did not switch the 8-K reporting between ATH and non-ATH and between LTD and all other days at least once during the sample period, reducing the sample by 18,000 forms. The resulting sample comprises 335,328 8-K forms. We define a company as public if it is included in CRSP. Focusing on the sample of public firms, we eliminate 8-K reports of firms traded over the counter (1931 forms). Using this definition, the data includes 195,750 8-K forms reported by public firms and 137,647 reported by nonpublic companies.[10]

We merge the sample of public firms with Compustat and further require nonmissing data on the control variables that are associated with strategic reporting. Specifically, we require data related to the complexity and riskiness of operations (proxied by the number of business segments and equity return volatility), analyst coverage, institutional ownership, and size. We also require non-missing equity returns around the 8-K filing date. Appendix 3 describes the variables used in this study. These restrictions eliminated 28,280 forms. The final sample consists of 167,470 reports filed by 5685 firms.

We analyzed the textual content of the form and each individual item using the Loughran and McDonald (2011) financial-positive and financial-negative word lists. For each of the 8-K forms we compute Form News as the difference between the total number of positive and negative financial words, and scale the difference by the total number of words. We compute voluntary and mandatory news similarly. See Appendix 2 for details on the textual analysis procedure.

[9] The SEC issued Release No. 34-49424, additional Form 8-K disclosure requirements and acceleration of filing date, in March 2004, and it became effective on August 23, 2004. The rule significantly increased the number of events to be reported in the 8-K report and shortened the period required to disclose these events to no more than four business days after the event.

[10] Both the Exchange Act and Securities Act require a company to register its securities with the SEC if those are held by 500 (and in some situations, 300) or more persons and the company's total assets exceed $10 million. Our definition of public firms is similar to that of Givoly et al. (2010).

Table 1 provides descriptive statistics related to the content and reporting strategy of the 8-K Form. *Panel A* shows that the proportion of 8-K reports containing voluntary news increased over time from 42 % in 2005 to around 52 % in 2013. The mean form news is negative around −0.006, with no discernible pattern across the sample years. The mean voluntary and mandatory news are also negative and stable over the years; the mean voluntary and nonvoluntary news are −0.009 and −0.004, respectively.

Panel B presents the mean of variables related to our proxies for disclosure timing, namely after trading hours (ATH),[11] last trading day (LTD), and after trading hours on last trading day of the week (ATH on LTD).[12] The proportion of forms reported ATH (ATH on LTD) is around 51 % (10.4 %) and is uniformly increasing, from 48 % (9.4 %) in 2005–55 % (12.1 %) in 2013. In contrast, the proportion of forms reported on LTD is stable over the years at around 21 %.

Panel C reports the content distribution of our sample of 8-K reports and the market reaction to the various items. The most commonly reported items are Item 8.01, "Other Events" (30 %); Item 1.01, "Entry into a Material Definitive Agreement" (24 %); Item 5.02, "Departure of Directors or Principal Officers, Election of Directors, Appointment of Principal Officers" (24 %); and Item 7.01, "Reg FD" (20 %). The strongest market reaction (−17.5 %) is to Item 1.03, "Bankruptcy or Receivership." Other items that elicit economically significant market reaction include notice of delisting (Item 3.01), events that trigger an increase in direct financial obligations (Item 2.04), notice of nonreliance on previously filed financial statements, i.e., restatements (Item 4.02), and announcement of material impairments (Item 2.06).

Table 2 reports construct validity analyses related to the news variable. We validate the news construct using equity returns. Table 2, Panel A, shows the mean of 3-day cumulative abnormal returns (CAR). The sign of the mean abnormal returns is consistent with the sign of the news and highly significant (p value <0.01), and the difference between the mean returns for the positive and negative news is positive and highly significant (p value <0.01).[13] Panel B presents the regression results of the 3-day CAR on each of form, voluntary news, and mandatory news. The regressions control for the number of items reported in the 8-K form, length of the filing (measured as the log number of words), and item and year fixed effects. The coefficient on the news is positive and highly significant (p value <0.01) in each of the regressions, indicating that there is linear relation between the magnitudes of the news and market reaction.

[11] Regular stock market hours are 9:30 a.m.–4 p.m. Eastern Time. About 88 % of the ATH cases were disclosed between 4 p.m. and 6 p.m. About 10 % of the observations were filed before market opens (BMO), and we treat them as filed during trading hours. Footnote 17 describes sensitivity analysis related to BMO disclosure.

[12] Throughout our analysis, we assume that the news is disseminated to the market via 8-K report first. We expand on this issue in Sect. 4.5.1.

[13] As a sensitivity analysis, we examine the mean market reaction by deciles formed on the basis of the news score. Untabulated results show that the mean market reaction generally increases with the news deciles, with the lowest (highest) mean return in the bottom (top) news deciles.

Table 1 Descriptive statistics

Panel A: *Form characteristics*

	Voluntary item	Form news	Voluntary news	Mandatory news
2005	0.426	−0.006	−0.009	−0.003
2006	0.451	−0.006	−0.009	−0.003
2007	0.465	−0.006	−0.009	−0.004
2008	0.480	−0.006	−0.009	−0.003
2009	0.524	−0.006	−0.009	−0.003
2010	0.500	−0.006	−0.009	−0.004
2011	0.494	−0.007	−0.009	−0.005
2012	0.523	−0.007	−0.009	−0.005
2013	0.518	−0.007	−0.009	−0.005
Average	0.483	−0.006	−0.009	−0.004

Panel B: *Disclosure strategy*

	After trading hours	Last trading day	After trading hours on last trading day
2005	0.479	0.212	0.094
2006	0.486	0.211	0.097
2007	0.491	0.215	0.099
2008	0.500	0.211	0.101
2009	0.517	0.204	0.105
2010	0.518	0.201	0.103
2011	0.524	0.204	0.108
2012	0.529	0.215	0.117
2013	0.550	0.21	0.121
Average	0.509	0.209	0.104

Panel C: *Reported items*

Item	Proportion	Abnormal return (%)
1.01	0.237	0.18***
1.02	0.019	−0.44***
1.03	0.000	−17.52***
2.01	0.025	−0.02
2.03	0.047	0.01
2.04	0.002	−1.44***
2.05	0.009	0.3*
2.06	0.004	−1.26***
3.01	0.015	−1.48***
3.02	0.019	−0.12
3.03	0.010	−0.21
4.01	0.010	−0.25**
4.02	0.004	−1.23***

Table 1 continued

Panel C: *Reported items*		
Item	Proportion	Abnormal return (%)
5.02	0.244	−0.07***
5.03	0.040	−0.19**
5.04	0.002	0.2
5.05	0.002	−0.27
7.01	0.196	0.18***
8.01	0.297	0.01

Panel A shows the proportion of forms reporting voluntary news (Voluntary Item), the mean of each of the 8-K form news, voluntary news, and mandatory news. Panel B shows the proportion of 8-K forms filed after trading hours, on the last trading day of the week, and after trading hours on the last trading day of the week. Panel C reports the proportion of reported items and the mean 3-day cumulative abnormal returns. ***, **, and * denote two-tailed significance at the 1, 5, and 10 % levels, respectively

Table 2 Construct validity analysis of the news score

	Form news	Voluntary news	Mandatory news
Panel A: *Mean abnormal returns for positive and negative news*			
Positive	0.116***	0.215***	0.049***
Negative	−0.046***	−0.031***	−0.043***
Difference (positive−negative)	0.168***	0.260***	0.096***
Panel B: *Regressions of abnormal returns on news*			
Constant	0.000	0.007***	−0.002*
	(0.799)	(0.002)	(0.093)
News score	0.094***	0.117***	0.044***
	(0.000)	(0.000)	(0.003)
Number of items	0.000	−0.001	0.000
	(0.707)	(0.333)	(0.927)
Filing length	0.000*	−0.000	0.001***
	(0.068)	(0.673)	(0.000)
Observations	167,470	80,956	101,673
R-squared	0.004	0.004	0.005

The results of construct validity analyses of the news variables. Panel A shows mean 3-day cumulative abnormal returns (3-day CAR) for positive and negative news. Panel B presents the regression results of the 3-day CAR on the news score, including item and year fixed effects. The control variables include the number of items and filing length which is computed as the log of the total number of words. In the Form_News column, we use the total number of words of the form. In the Voluntary News (Mandatory News) column, the filing length is measured as the number of words of the voluntary news items (mandatory news items). ***, **, and * denote two-tailed significance at the 1, 5, and 10 % levels, respectively

Taken together, the results in Table 2 indicate that the textual analysis news measure captures the tone of the news. However, similar to the findings in the literature (e.g., Loughran and McDonald 2011), we also observe very low R-squared, which indicates that the news score has low ability to explain abnormal returns. We therefore conduct extensive sensitivity analyses throughout.

4 Results

4.1 Reporting strategy of negative news

We start the analysis by examining firm-level differences in news across the different disclosure timings. These firm-level tests are powerful because they use each firm as its own control. The results are presented in Table 3, Panel A. For each firm, we compute the difference between the mean news reported ATH and non-ATH. The means of the difference in the form news, voluntary news, and mandatory news are presented in the *ATH–Non ATH* row. We compute similarly the mean of the firm level difference between the mean news reported LTD and all other days (*LTD–Non LTD*) and between the mean news reported ATH on LTD and all other times (*ATH on LTD–Non ATH on LTD*). If firms report strategically whereby more negative news is reported when investor attention is low, then we expect to find negative values in each of the cells in the panel. The results are consistent with strategic reporting of negative news. Firms report more negative news forms as well as voluntary and mandatory news ATH in comparison to non-ATH, and the differences are significant at the 5 % level or better. Firms also report more negative 8-K forms and voluntary news on LTD relative to all other days and on ATH on LTD compared to all other times.

We next examine reporting strategy using multivariate regressions. Following Doyle and Magilke (2009), we control for factors that are associated with ATH reporting. Specifically, the likelihood of ATH increases with complexity of operations (proxied by the number of business segments), analyst coverage, and institutional ownership and decreases with size. In addition, companies in the Eastern and Central time zones are less likely to report ATH. Following Baginski et al. (1995), we control for the economic magnitude of the event by including the absolute value of 3-day CAR centered on the filing date. Baginski et al. (1995) show that firms tend to release larger shock earnings forecasts ATH, potentially to allow investors more time to digest the news. Finally, we also control for operating risk, proxied by the volatility of daily stock returns.

Table 3, Panel B, reports the regression results. The coefficient on the news variable is negative and highly significant (p value <1 %) in the ATH regressions, indicating that the likelihood of ATH increases with the negativity of the news. The LTD regressions indicate that firms are more likely to report negative forms (p value <5 %) and voluntary news (p value <1 %) on Fridays. The results of the ATH on LTD regressions are similar to the ATH regressions—firms are more likely to report strategically when news is negative.

The coefficients on the control variables are significant primarily in the ATH regressions. The likelihood of ATH increases with the number of items reported. Like Doyle and Magilke (2009), we generally find that firms with more analysts are more likely to release news ATH and that firms located in the Eastern or Central time zone are less likely to report ATH. However, we find that larger firms are more likely to report ATH. We also find a positive relation between operating risk and the likelihood of ATH reporting.[14]

[14] Kothari et al. (2009) show that litigation risk, distress risk, and information asymmetry moderate the decision of firms to delay the disclosure of negative news. Untabulated results indicate that these variables

Taken together, the results in Table 3 provide evidence in support of strategic reporting of negative news. Firms tend to report negative news ATH, LTD, and ATH on LTD, and these results hold after controlling for the economic magnitude of the event, operating complexity and risk, size, time zone, investor coverage, and form complexity. Hence the results are consistent with managers reporting negative news as if they believe in investor inattention.

To examine whether the results are affected by the way we measure news, we re-estimate the regressions using the sign of equity returns as proxy for news. Specifically, we define negative news indicator as one if the 3-day CAR is negative and zero otherwise. Here a positive coefficient on the negative news indicator would be consistent with strategic reporting. In a separate analysis, we define as negative news all forms containing a priori negative news. In particular, we define negative news 8-K reports as those which include the following items: Item 1.02, "Termination of a Material Definitive Agreement"; Item 1.03, "Bankruptcy or Receivership"; Item 2.04, "Triggering Events That Accelerate or Increase a Direct Financial Obligation or an Obligation under an Off-Balance Sheet Arrangement"; Item 2.06, "Material Impairments"; Item 3.01, "Notice of Delisting or Failure to Satisfy a Continued Listing Rule or Standard; Transfer of Listing"; Item 4.01, "Changes in Registrant's Certifying Accountant"; and Item 4.02, "Non-Reliance on Previously Issued Financial Statements or a Related Audit Report or Completed Interim Review." Table 3, Panel C, presents the regression results. Consistent with the evidence in Panel B, we find in both sets of regressions that the coefficient on the negative news indicator is positive and significant at 5 % or better, except for the LTD regression when we use equity return as proxy for news where the coefficient is significant one-tailed (p value two-tailed =0.167).[15] In an untabulated analysis, we define negative news as one if the news score is in the lowest quartile of the news measure. Consistent with the evidence in the table, we find that firms are more likely to disclose ATH and ATH on LTD when news is negative.

To further rule out alternative explanations, we undertake several sensitivity analyses. First, although we eliminate firms that did not switch between ATH and non-ATH and between LTD and non-LTD the reporting of 8-K forms, one could argue that firms may report systematically certain items strategically. For example, firms may report a priori negative news ATH and positive 8-K forms non-ATH, and hence one could find spurious positive correlation between ATH and negative news. To address this issue, we focus on ATH reporting and include in the sample 8-K reports of firms that switched the reporting of the reported item at least once during the sample period. In other words, for each item, we include in the sample 8-K reports of firms that switched the reporting of the specific item between ATH and non-ATH at least once. Results indicate firms are still more likely to report negative

Footnote 14 continued
are not related to the decision to disclose when investor attention is low, and controlling for these variables does not affect the inferences.

[15] The specification is based on negative news indicator in the equity return regressions because we also control for the absolute value of CAR. If we instead use equity returns as the proxy for news and omit absolute CAR from the regression, we find that the coefficient on the news variable is negative and significant, consistent with strategic reporting of negative news.

Table 3 Disclosure strategy

Panel A: *Firm level analysis of disclosure strategy*

	Form news	Voluntary news	Mandatory news
ATH–Non ATH	−0.033**	−0.098***	−0.030***
LTD–Non LTD	−0.034***	−0.049**	0.000
ATH on LTD–Non ATH on LTD	−0.132***	−0.149***	0.010

Panel B: *Reporting strategy and firm characteristics*

Variables	After trading hours (ATH)			Last trading day (LTD)			ATH on LTD		
	Form	Voluntary	Mandatory	Form	Voluntary	Mandatory	Form	Voluntary	Mandatory
Constant	−0.747***	−0.983***	−0.915***	−1.262***	−1.332***	−1.376***	−2.553***	−3.014***	−2.733***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
News (−)	−3.276***	−3.953***	−1.524***	−1.280**	−2.175***	0.153	−4.275***	−5.977***	−1.501*
	(0.000)	(0.000)	(0.006)	(0.017)	(0.003)	(0.800)	(0.000)	(0.000)	(0.057)
Absolute CAR	−0.107	−0.292	0.062	−0.225	0.012	−0.371*	−0.421*	−0.400	−0.334
	(0.466)	(0.146)	(0.739)	(0.165)	(0.959)	(0.077)	(0.058)	(0.227)	(0.210)
Number of items	0.035***	0.140***	0.023**	−0.036***	0.055**	−0.039***	−0.044***	0.153***	−0.051***
	(0.001)	(0.000)	(0.030)	(0.002)	(0.026)	(0.001)	(0.006)	(0.000)	(0.002)
Standard deviation of daily return	1.392***	0.801***	1.856***	−0.108	−0.664***	0.227*	0.909***	0.140	1.267***
	(0.000)	(0.000)	(0.000)	(0.334)	(0.000)	(0.069)	(0.000)	(0.622)	(0.000)
Number of segments	−0.012*	−0.010	−0.012*	0.000	−0.003	−0.001	−0.005	−0.009	−0.007
	(0.089)	(0.289)	(0.099)	(0.997)	(0.591)	(0.743)	(0.439)	(0.345)	(0.309)
Eastern time zone indicator	−0.201***	−0.160***	−0.213***	0.020	0.035	0.009	−0.111***	−0.042	−0.131***
	(0.000)	(0.000)	(0.000)	(0.226)	(0.178)	(0.633)	(0.000)	(0.293)	(0.000)

Table 3 continued

Panel B: Reporting strategy and firm characteristics

Variables	After trading hours (ATH)			Last trading day (LTD)			ATH on LTD		
	Form	Voluntary	Mandatory	Form	Voluntary	Mandatory	Form	Voluntary	Mandatory
Log market value	0.037***	0.022*	0.051***	0.012*	0.012	0.015**	0.036***	0.043***	0.039***
	(0.000)	(0.098)	(0.000)	(0.070)	(0.236)	(0.043)	(0.000)	(0.003)	(0.000)
Number of analysts	0.010***	0.009**	0.011***	−0.003*	−0.007***	−0.000	0.002	−0.005	0.004
	(0.000)	(0.016)	(0.000)	(0.070)	(0.004)	(0.916)	(0.484)	(0.213)	(0.160)
Institutional ownership	0.011	−0.065	0.063*	−0.068***	−0.091***	−0.054**	−0.054	−0.121**	−0.015
	(0.767)	(0.180)	(0.094)	(0.003)	(0.010)	(0.039)	(0.132)	(0.032)	(0.689)
Observations	167,470	80,956	101,672	167,470	80,949	101,672	167,460	80,949	101,657

Panel C: Reporting strategy using alternative proxies for news

Variables	Equity return as proxy for news			A priori negative news		
	ATH	LTD	ATH on LTD	ATH	LTD	ATH on LTD
Constant	−0.757***	−1.269***	−2.563***	−0.909***	−1.301***	−2.663***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Negative news indicator (+)	0.028***	0.017	0.033**	0.405***	0.138***	0.380***
	(0.004)	(0.167)	(0.045)	(0.000)	(0.000)	(0.000)
Absolute CAR	−0.083	−0.214	−0.395*	−0.410***	−0.461***	−0.732***
	(0.573)	(0.188)	(0.077)	(0.005)	(0.004)	(0.001)

Table 3 continued

Panel C: Reporting strategy using alternative proxies for news

Variables	Equity return as proxy for news			A priori negative news		
	ATH	LTD	ATH on LTD	ATH	LTD	ATH on LTD
Number of items	0.038***	−0.035***	−0.041**	0.132***	0.005	0.030**
	(0.000)	(0.003)	(0.011)	(0.000)	(0.624)	(0.039)
Standard deviation of daily return	1.398***	−0.107	0.916***	1.461***	−0.088	0.989***
	(0.000)	(0.339)	(0.000)	(0.000)	(0.439)	(0.000)
Number of segments	−0.012*	−0.000	−0.005	−0.012*	−0.001	−0.006
	(0.088)	(0.997)	(0.430)	(0.093)	(0.885)	(0.381)
Eastern time zone indicator	−0.201***	0.019	−0.112***	−0.209***	0.012	−0.124***
	(0.000)	(0.233)	(0.000)	(0.000)	(0.462)	(0.000)
Log market value	0.037***	0.011*	0.036***	0.026***	0.003	0.023**
	(0.000)	(0.072)	(0.000)	(0.009)	(0.600)	(0.023)
Number of analysts	0.010***	−0.003*	0.002	0.010***	−0.003*	0.002
	(0.000)	(0.077)	(0.437)	(0.000)	(0.081)	(0.354)
Institutional ownership	0.011	−0.068***	−0.054	0.019	−0.064***	−0.048
	(0.767)	(0.003)	(0.135)	(0.621)	(0.005)	(0.194)
Observations	167,470	167,470	167,460	167,470	167,470	167,460

Table 3 continued

Panel D: Reporting strategy for within item switchers

Variables	Within item switchers			Within item-year switchers		
	Form	Voluntary	Mandatory	Form	Voluntary	Mandatory
Constant	−0.642***	−1.015***	−0.736***	−0.311***	−0.681***	−0.317***
	(0.000)	(0.000)	(0.000)	(0.004)	(0.000)	(0.001)
News (−)	−3.383***	−4.007***	−1.403**	−2.928***	−3.478***	−0.761
	(0.000)	(0.000)	(0.019)	(0.000)	(0.000)	(0.305)
Absolute CAR	−0.086	−0.289	0.093	−0.272	−0.469**	−0.108
	(0.580)	(0.162)	(0.645)	(0.136)	(0.044)	(0.667)
Number of items	0.054***	0.144***	0.042***	0.054***	0.103***	0.051***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Standard deviation of daily return	1.078***	0.735***	1.448***	0.542***	0.236	0.928***
	(0.000)	(0.001)	(0.000)	(0.000)	(0.241)	(0.000)
Number of segments	−0.008	−0.009	−0.006	−0.005	−0.005	−0.003
	(0.242)	(0.352)	(0.360)	(0.389)	(0.542)	(0.612)
Eastern time zone indicator	−0.173***	−0.154***	−0.173***	−0.072***	−0.062*	−0.076***
	(0.000)	(0.000)	(0.000)	(0.001)	(0.057)	(0.000)
Log market value	0.021**	0.016	0.031***	0.006	0.010	0.009
	(0.026)	(0.221)	(0.002)	(0.463)	(0.456)	(0.246)
Number of analysts	0.011***	0.010***	0.011***	0.007***	0.007**	0.007***
	(0.000)	(0.005)	(0.000)	(0.001)	(0.034)	(0.000)

Table 3 continued

Panel D: Reporting strategy for within item switchers

Variables	Within item switchers			Within item-year switchers		
	Form	Voluntary	Mandatory	Form	Voluntary	Mandatory
Institutional ownership	0.007	−0.072	0.070*	−0.028	−0.081*	0.018
	(0.843)	(0.144)	(0.059)	(0.357)	(0.067)	(0.547)
Observations	143,685	76,195	82,153	87,912	51,801	46,929

The results concerning the relation between disclosure timing and the sign of news. Panel A presents the mean differences in news score across disclosure timing. For each firm, we compute the mean news score of the 8-K form as a whole and of voluntary and mandatory news separately for news reported ATH and non-ATH. The mean of the differences between the news reported ATH and news reported non-ATH is presented in the ATH–Non ATH row. Similarly, for each firm we compute the mean difference in the news reported on the last trading day (LTD) and all other days and the mean difference in the news reported after trading hours on the last trading day and all other times. The mean differences across all firms are presented in the LTD–Non LTD and the ATH on LTD–Non ATH on LTD rows, respectively. Panel B shows the regression results of the disclosure strategy variables on form and firm characteristics. p values are reported in parentheses. Expected sign for main variables of interest appear next to variable name. We estimate the following model

$$\begin{aligned} \textit{Disclosure Strategy Variable} = {} & a0 + a1 \times \textit{News} + a2 \times \textit{Absolute CAR} + a3 \times \textit{Number of Items} \\ & + a4 \times \textit{SD of Daily Returns} + a5 \times \textit{Number of Segments} \\ & + a6 \times \textit{Eastern Time Zone Indicator} + a7 \times \textit{Log Market Value} + a8 \times \textit{Number of Analysts} \\ & + a9 \times \textit{Institutional Ownership} + \textit{Year/Item/Industry Fixed Effects} + \varepsilon. \end{aligned}$$

The disclosure strategy variables are indicators for after trading hours (ATH), last trading day (LTD), and after trading hours on last trading day (ATH on LTD). Absolute CAR is the absolute value of the 3-day cumulative abnormal returns. All other variables are defined in Appendix 3. The regressions are estimated using logit, and include year, item, and Fama and French (1997) industry classification fixed effect. The standard errors correct for firm clustering. Panel C shows the disclosure strategy regression using equity returns as proxy for news and a priori negative news. In the first three columns from the left, the negative news variable is an indicator with a value of 1 if 3-day abnormal returns are negative and zero otherwise. In the second set of regressions, the negative news indicator takes the value of 1 if the 8-K form includes one of the following: Item 1.02, "Termination of a Material Definitive Agreement"; Item 1.03, "Bankruptcy or Receivership"; Item 2.04, "Triggering Events That Accelerate or Increase a Direct Financial Obligation or an Obligation under an Off-Balance Sheet Arrangement"; Item 2.06, "Material Impairments"; Item 3.01, "Notice of Delisting or Failure to Satisfy a Continued Listing Rule or Standard; Transfer of Listing"; Item 4.01, "Changes in Registrant's Certifying Accountant"; and Item 4.02, "Non-Reliance on Previously Issued Financial Statements or a Related Audit Report or Completed Interim Review" and zero otherwise. Panel D, replicates the ATH regressions in Panel A for sample of within-item switchers. The first three columns show the results when we include in the sample 8-K reports of firms that switched the reporting of the reported item at least once during the sample period. In other words, for each item, we include in the sample 8-K reports of firms that switched between ATH and non-ATH at least once the reporting of the specific item. The columns labeled Within Item-Year Switchers show the regression results we include in the sample 8-K reports of firms that switched between ATH and non-ATH at least once during the calendar year the reporting of the specific item. ***, **, and * denote two-tailed significance at the 1, 5, and 10 % levels, respectively

news ATH. In an even more restrictive criterion, we include in the sample 8-K reports of firms that switched between ATH and non-ATH at least once during the calendar year the reporting of the specific item. The results are reported in Table 3, Panel D. Similar to the results reported in previous panels, firms are more likely to report ATH when news is negative, except for mandatory news, when we require switching of the same item during the calendar year. We also compare the mean news reported ATH and non-ATH at the firm level for the two samples above. Untabulated results indicate that news reported ATH is more negative than the mean news reported non-ATH, again consistent with the investor inattention hypothesis.

Second, one can argue that the reporting of negative news after trading hours is not related to investor inattention but rather to the desire of managers to give investors more time to understand the implications of the reported event. Specifically, negative news may generate a larger price reaction and may be considered a high profile event, and therefore managers may choose to disclose it after the market closes. To rule out this explanation, we rank the sample forms to quartiles based on the sign and size of the 3-day CAR of the event. We then restrict the sample to those forms that generated the largest positive 3-day CAR (top quartile of the positive abnormal returns forms) and to those observations that generated the lowest (in absolute value) negative abnormal returns. Hence the sample comprises the highest profile *positive* events (mean 3-day CAR is 9 %) and the lowest profile *negative* events (mean 3-day CAR is −0.4 %). If the alternative explanation that the reporting of the news is determined by the extent of its impact on firm value is correct, then we would expect to find that the negative events are *less likely* to be reported after trading hours. Although in this setting the positive news forms are of much higher profile and have much larger effect on firms' value than the negative news forms, untabulated results show that the latter are still more likely to be reported ATH or LTD, consistent with investor inattention.

Third, Michaely et al. (2014) suggest that firms with better corporate governance tend to release earnings outside trading hours, potentially to allow investors time to absorb and process the information and to level the playing field among them. However, the limited-attention argument would also suggest that opportunism (likely correlated with weaker governance) is associated with the reporting of negative news ATH. Hence we do not make a prediction with respect to the association between strategic reporting of negative news and the quality of corporate governance. We measure the quality of governance using the GIM index in one specification and the entrenchment index in another.[16] The results (untabulated) indicate that the quality of corporate governance does not affect the decision to report 8-K events ATH and, importantly, that firms report negative news after trading hours even when controlling for the quality of governance. Fourth, we examine whether the results are affected if we hold the sample firms constant. We continue to find that firms report negative news after trading hours.[17]

[16] We do not control for governance in the reported results because data on the GIM and entrenchment variables is limited, resulting in a significantly smaller sample.

[17] We also examine whether filing before market opens (BMO) is associated with strategic reporting of negative news. We find that there is no association between the type of news and BMO reporting; the likelihood of negative news reported BMO is similar to that of positive news.

4.2 Strategic reporting through disclosure timing by public and nonpublic firms

One of the key aspects of the Gennotte and Trueman (1996) model is the link between corporate disclosure and *observed* firm value; managers want to maximize the firm's post-announcement value and hence engage in strategic disclosure of earnings news. Given that the main incentive is to maximize post-announcement value, another useful way for investigating strategic disclosure is to examine the link to the availability of market prices and, in particular, to compare the strategic disclosure of public and nonpublic firms. For this purpose, we augment the sample of 8-K reports filed by public companies by adding 8-K reports of nonpublic companies (137,647), bringing the total sample size to 305,117 8-K reports.

Untabulated results indicate that public and nonpublic firms differ in the characteristics of their 8-K reports. Public firms annually report more 8-Ks on average (5.67 vs. 4.32) and a greater proportion of voluntary news. They also report less negative news on average as well as less negative voluntary and mandatory news. In addition, public companies are more likely to report when investor attention is presumably low, especially ATH in general and ATH on LTD.

We start the analysis by comparing the mean news reported strategically versus all other times separately for public and nonpublic companies. Consistent with the results in the previous table, Table 4, Panel A, shows that public firms report more negative news ATH relative to non-ATH and ATH on LTD relative to all other times and the differences are highly significant (p value <0.01). In addition, public firms report more negative voluntary news on LTD relative to all other days. In contrast, nonpublic firms report *less* negative form and voluntary news ATH and ATH on LTD and more negative mandatory news LTD and ATH on LTD. Hence these results indicate that the two types of firms differ in the reporting of negative news; consistent with the conjecture of Gennotte and Trueman (1996), we observe greater likelihood of strategic reporting for companies with observed market values.

Table 4, Panel B, presents the regression results of the disclosure strategy variables on news. We estimate the following model:

$$\begin{aligned} \textit{Disclosure Strategy Variable} = {} & a0 + a1 \times \textit{News} + a2 \times \textit{Dummy}(\textit{Public}) \\ & + a3 \times \textit{Dummy}(\textit{Public}) \times \textit{News} \\ & + a4 \times \textit{Number of Items} \\ & + \textit{Fixed Effects} + \varepsilon, \end{aligned}$$

where the dependent variables are the ATH, LTD, and ATH on LTD indicators. The independent variables include the news, an indicator for public firms, an interaction of the public company indicator and the news variable, and the number of items. In the above specification, a negative (positive) $a1$ coefficient indicates greater (lower) likelihood of strategic disclosure of negative news by nonpublic firms; $a2$ represents the difference in the likelihood of disclosure when investor attention is low between public and nonpublic firms; and $a3$ captures the difference in the association between strategic disclosure and news between public and nonpublic firms. The sum of the coefficients $a1$ and $a3$ provides the overall association between the strategic

Table 4 Unconditional analysis of reporting strategy of public versus non-public companies

Panel A: *Mean news by disclosure timing*

	After trading hours (ATH)			Last trading day (LTD)			After trading hours on last trading day (ATH on LTD)		
	Non-ATH	ATH	Difference	Non-LTD	LTD	Difference	Non-ATH on LTD	ATH on LTD	Difference
Public firms									
Form_News	−0.612	−0.646	−0.034***	−0.617	−0.610	0.007	−0.606	−0.625	−0.019***
Voluntary news	−0.893	−1.070	−0.178***	−0.897	−0.949	−0.052***	−0.855	−0.970	−0.116***
Mandatory news	−0.395	−0.428	−0.033***	−0.398	−0.402	−0.004	−0.377	−0.416	−0.039***
Non-public firms									
Form_News	−1.005	−0.919	0.086***	−0.963	−0.977	−0.014	−0.971	−0.923	0.048***
Voluntary news	−1.382	−1.288	0.094***	−1.343	−1.340	0.003	−1.350	−1.259	0.091***
Mandatory news	−0.716	−0.709	0.007	−0.707	−0.731	−0.024*	−0.709	−0.743	−0.034**

Panel B: *Reporting strategy and news type—public versus non-public companies*

	After trading hours (ATH)			Last trading day (LTD)			ATH on LTD		
	Form	Voluntary	Mandatory	Form	Voluntary	Mandatory	Form	Voluntary	Mandatory
Constant	−0.732***	−0.742**	−0.931***	−1.335***	−1.265***	−1.505***	−2.591***	−2.628***	−2.857***
	(0.000)	(0.010)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
News (?)	0.668	1.165*	0.198	−0.784*	0.051	−0.619	−0.298	1.391	−1.537*
	(0.178)	(0.066)	(0.756)	(0.078)	(0.928)	(0.300)	(0.683)	(0.184)	(0.050)

Table 4 continued

Panel B: Reporting strategy and news type—public versus non-public companies

	After trading hours (ATH)			Last trading day (LTD)			ATH on LTD		
	Form	Voluntary	Mandatory	Form	Voluntary	Mandatory	Form	Voluntary	Mandatory
Public company indicator (?)	0.320**	0.035	0.571***	0.029	−0.184*	0.182	0.215	−0.123	0.402**
	(0.021)	(0.857)	(0.000)	(0.745)	(0.069)	(0.106)	(0.173)	(0.546)	(0.017)
Public company indicator*news (−)	−3.891***	−5.228***	−2.135***	0.124	−2.025**	1.009	−3.444***	−7.271***	0.107
	(0.000)	(0.000)	(0.008)	(0.854)	(0.031)	(0.213)	(0.001)	(0.000)	(0.919)
Number of items (+)	0.081***	0.102***	0.080***	−0.001	0.030*	−0.001	0.030***	0.104***	0.030***
	(0.000)	(0.000)	(0.000)	(0.850)	(0.056)	(0.921)	(0.001)	(0.000)	(0.001)
Observations	305,117	138,281	193,542	305,117	138,275	193,542	305,108	138,272	193,533
F test: public firms news (−)	−3.223***	−4.064***	−1.937***	−0.660	−1.974***	0.390	−3.742***	−5.880***	−1.429*
T	−5.189	−4.747	−3.590	−1.254	−2.642	0.666	−4.660	−4.990	−1.865

The results of the analysis related reporting strategy through disclosure timing for nonpublic and public companies. Panel A presents the mean news for each reporting strategy timing versus all other times and the difference in the news. For example, in the first three columns from the left, we show the mean news reported not after trading hours (labeled Non-ATH), mean news reported after trading hours (labeled ATH), and the difference between the news reported ATH and non-ATH. Panel B shows the regression results of the disclosure strategy variables on form characteristics and type of company. We estimate the following model

$$\begin{aligned} Disclosure\ Strategy\ Variable = {} & a0 + a1 \times News + a2 \times Dummy(Public) + a3 \times Dummy(Public) \\ & \times News + a4 \times Number\ of\ Items + Year/Item/Industry\ Fixed\ Effects + \varepsilon. \end{aligned}$$

The disclosure strategy variables are indicators for after trading hours (ATH), last trading day (LTD), and ATH on LTD. All other variables are defined in Appendix 3. The regressions are estimated using logit. *p* values are reported in parentheses. Expected signs for main variables of interest appear next to variable name. The regressions include year, item, and Fama and French (1997) industry classification fixed effects. The standard errors correct for firm clustering. ***, **, and * denote two-tailed significance at the 1, 5, and 10 % levels, respectively

disclosure variables and the news for public firms, and its interpretation is similar to $a1$. We also estimate the regression by restricting the sample to each of voluntary and mandatory news to examine whether firms strategically report voluntary and mandatory items, respectively. The regressions are estimated using Logit, and the standard errors are corrected for firm clustering. The regressions include year, item, and Fama and French (1997) industry classification fixed effects.

The first three columns indicate that the likelihood of reporting 8-K ATH is significantly greater for public firms (p value <0.01). The coefficient on the news variable is generally not significant, indicating that the likelihood of ATH reporting by nonpublic firms is not related to the news. The coefficient on the interaction variable of the public indicator and news variable is negative and significant (p value <0.01), indicating that public firms are more likely to report negative news ATH relative to nonpublic firms. The F-test reported at the bottom of the table indicates that the overall coefficient on the news variable for public firms is negative and highly significant (p value <0.01). Taken together, these results suggest that the likelihood of ATH reporting is higher for public firms in general (relative to nonpublic firms) and especially higher when news are negative.

The next three columns show the LTD regression results. The coefficients by and large are not significant, indicating that there is no relation between the likelihood of LTD reporting and the sign of the news for both public and nonpublic firms. The only exception is voluntary news. We observe that, while public firms are less likely to report voluntary news in general on LTD (relative to nonpublic firms), they are more likely to report LTD (relative to nonpublic firms) when the voluntary news is negative. In addition, the F-test indicates that public firms report negative voluntary news LTD in general.

The LTD regressions do not control for the possibility that the news on LTD is released before market opens or during trading hours, thereby allowing investors to react promptly. The last three columns show the regression results where the dependent variable is the ATH on LTD indicator variable. The results are similar to the ATH regressions. In particular, except for mandatory news, the likelihood of 8-K reporting ATH on LTD is higher for public firms when the news is negative. Both types of firms are more likely to disclose negative mandatory news ATH on LTD when the news is negative.

Overall, the results are consistent with the strategic timing of disclosure of negative news by public firms. Whereas there is no relation between the signs of the news and disclosure timing for nonpublic firms, we find that public firms are more likely to report negative news when investor attention is low.[18]

The differences that we document between public and nonpublic companies could be attributed to some unobserved correlated omitted variable, primarily firm size, which is likely the main difference between public and nonpublic companies. Absent financial statement data on nonpublic companies, we cannot examine the

[18] We examine whether the results are sensitive to the measurement of the news variable. Specifically, we re-estimate the regressions defining as negative news all forms containing a priori negative news (see Sect. 4.1 for detail). In an additional analysis, we define negative news as one if the news score is in the lowest quartile. In both analyses, we observe that the likelihood of strategic reporting of negative news is higher for public firms than nonpublic ones.

moderating impact of size directly. However, to test whether size potentially affects the results, we focus on public companies and examine whether the likelihood of strategic reporting is moderated by size. We define small firms as those firms in the lowest quartile formed on the basis of market value of equity at the beginning of the year. We find no difference in the likelihood of strategic reporting of negative news between small firms and all others.

4.3 Strategic reporting through news bundling

In this subsection, we examine whether firms engage in strategic bundling, and whether the likelihood of strategic reporting using bundling increases with the likelihood of strategic reporting through disclosure timing. Throughout the analyses, we compare the likelihood of strategic bundling by public firms with nonpublic firms. This allows us to examine whether capital market pressure motivates strategic reporting using bundling.

We define strategic reporting using bundling as incidences where firms report both voluntary and mandatory news with conflicting signs in the same 8-K report, i.e., positive (negative) voluntary news together with negative (positive) mandatory news. As indicated above, firms have discretion regarding whether to disclose voluntary news, and importantly, when to report the news. This flexibility allows firms to strategically disclose voluntary items to mitigate the impact of negative mandatory news. Firms may choose to release positive voluntary news together with negative mandatory news to mitigate the negative impact of the latter. Alternatively, firms may choose to release negative voluntary news together with positive mandatory news to reduce the negative impact of the former.[19]

Given that managers engage in strategic reporting to minimize the reaction to negative news, we predict that firms that do so through disclosure timing are also more likely to use bundling in general and bundling of voluntary and mandatory news with conflicting signs in particular. To this end, we construct a firm-year proxy of strategic reporting through disclosure timing, which is based on the proportion of negative news reported ATH or LTD. Specifically, for each firm year, we compute the number of negative news forms reported ATH or LTD, starting from the beginning of the sample period until the beginning of the current year, scaled by the total number of negative forms reported during the same period.[20] A ratio closer to 1 indicates greater propensity to report negative news strategically. Untabulated descriptive statistics indicate that the mean (median) of the ratio is 0.61 (0.62); around 7 % (16 %) of the firm-years have a ratio of 0 (1), indicating that these firms never (always) report negative news when investor attention is low.

[19] An alternative strategy is analogous to the "big bath" strategy—reporting all negative news together or, conversely, bundling positive voluntary and mandatory news. We choose to focus on the more plausible motivation for strategic reporting (that is, mitigating the reaction to negative events) and thus concentrate on cases where the firms report both voluntary and mandatory items but with conflicting signs.

[20] We construct this cumulative measure, rather than an annual measure, because the filing of 8-K reports varies considerably over time, and the average number of 8-K reports filed annually is fairly small, with an even lower number of forms with negative news.

Table 5, Panel A, shows the number of forms by the number of items reported in the 8-K form and the proportion of forms that include voluntary news by the number of items reported on the 8-K form. The majority of multiple-item forms include two items (40,701 forms out of a total of 56,565 multiple-item forms), and the frequency of forms decreases rapidly with the number of items—only 1296 forms include more than five items. The table also shows that the likelihood of reporting a voluntary item together with a mandatory item is an inverted U-shape function; it increases up to four items and then decreases uniformly.

Panel B reports the frequency of 8-K filings, which includes both voluntary and mandatory items, by positive and negative voluntary and mandatory news, for public and nonpublic firms. Conditioning on negative mandatory news, public firms are more likely than nonpublic ones to report positive voluntary news—48.2 % compared with 43.8 %. When we condition on negative voluntary news, we find that the likelihood of reporting positive mandatory news for public firms is 0.36 [2627/(2627 + 4625)], and the corresponding statistic for nonpublic firms is also 0.36. Hence these results suggest that public firms are more likely to bundle news with conflicting signs than nonpublic firms, especially if the firm reports negative mandatory news.

Table 5, Panel C, presents the regression results of the proxies for strategic reporting through news bundling on the proxy for strategic reporting through disclosure timing. For each bundling proxy, we report two sets of regressions. The first examines whether public firms are more likely to report bundled news, and the second is based on public companies only, controlling for the complexity of operations and disclosure environment. The dependent variables are indicator variables. In the likelihood of bundling regressions, the dependent variables take the value of one if the firm reported at least one bundled form during the year and zero otherwise. In the positive voluntary and negative mandatory (negative voluntary and positive mandatory) regressions, the dependent variables take the value of one if the firm reported bundled 8-K with positive voluntary and negative mandatory news (negative voluntary and positive mandatory news) and zero otherwise. In the disagreement between voluntary and mandatory regressions, the dependent variables takes the value of one if the firm reported bundled news with conflicting sign and zero otherwise. The regressions are estimated using logit with year and industry fixed effects (untabulated). The standard errors correct for firm clustering.[21]

The regressions indicate that public firms are significantly (p value <0.01) more likely to report bundled news compared to nonpublic firms across all specifications of news bundling. The coefficient on the proxy for strategic reporting through disclosure timing is also positive and significant in all regressions (except for the regression of positive voluntary and negative mandatory when the control variables are included), indicating that firms which are more likely to engage in strategic reporting through disclosure timing are also more likely to report strategically using news bundling in general and by bundling voluntary and mandatory items with conflicting signs. The coefficients on the control variables indicate that the

[21] Since the regressions are estimated at the firm-year level (as opposed to firm-form level in previous regressions), we do not control for item fixed effect or the economic impact of the form.

Table 5 Reporting strategy and news bundling

Panel A: *Proportion of voluntary and mandatory items by form complexity*

Number of items	Number of forms (56,565 in total)	Proportion with voluntary news
2	40,701	48.61
3	10,344	54.78
4	3052	61.24
5	1172	52.05
≥6	1296	44.06

Panel B: *Positive and negative voluntary and mandatory news*

Mandatory news	Public firms		Non public firms	
	Voluntary news		Voluntary news	
	Positive	Negative	Positive	Negative
Positive	3619	2627	2884	2072
	(57.94 %)	(42.06 %)	(58.19 %)	(41.81 %)
Negative	4291	4625	2885	3708
	(48.15 %)	(51.85 %)	(43.76 %)	(56.24 %)

Table 5 continued

Panel C: Regressions of strategic reporting through bundling on strategic reporting of negative news through disclosure timing

	Likelihood of bundling		Positive voluntary and negative mandatory		Negative voluntary and positive mandatory		Disagreement between voluntary and mandatory	
Constant	−1.504***	−2.163***	−3.208***	−4.161***	−3.357***	−2.924***	−2.617***	−2.931***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Public company indicator	0.344***		0.407***		0.218***		0.352***	
	(0.000)		(0.000)		(0.000)		(0.000)	
Strategic reporting (+)	0.199***	0.220***	0.120*	0.054	0.269***	0.296***	0.176***	0.154**
	(0.000)	(0.001)	(0.050)	(0.531)	(0.000)	(0.004)	(0.001)	(0.040)
Standard deviation of daily return		2.237***		1.755***		1.625***		1.783***
		(0.000)		(0.000)		(0.000)		(0.000)
Number of segments		0.043***		0.054***		0.026		0.045***
		(0.000)		(0.000)		(0.120)		(0.000)
Eastern time zone indicator		0.062		0.069		−0.015		0.060
		(0.133)		(0.191)		(0.815)		(0.193)
Log market value		0.032**		0.055***		−0.015		0.032*
		(0.035)		(0.005)		(0.525)		(0.061)
Number of analysts		0.011***		0.000		0.009*		0.004
		(0.002)		(0.987)		(0.097)		(0.283)

Table 5 continued

Panel C: Regressions of strategic reporting through bundling on strategic reporting of negative news through disclosure timing

	Likelihood of bundling		Positive voluntary and negative mandatory		Negative voluntary and positive mandatory		Disagreement between voluntary and mandatory	
Institutional ownership		−0.046		−0.158*		−0.024		−0.108
		(0.440)		(0.053)		(0.800)		(0.121)
Observations	45,839	23,795	45,839	23,795	45,839	23,795	45,839	23,795

The results of news bundling analysis. Panel A shows the number of 8-K forms and the proportion of forms with voluntary news, by the number of items included in the 8-K. For example, there are 40,701 8-K forms containing two items, and 48.6 % of these 8-K reports include voluntary news. Panel B presents the frequency of positive and negative voluntary and mandatory news for all 8-K reports, which include both voluntary and mandatory news separately for public and nonpublic firms. Panel C provides the regression results. We estimate the following model

$$Bundling\ Variable = a0 + a1 \times Dummy(Public) + a2 \times Strategic\ Reporting + Controls + Year/Industry\ Fixed\ Effects + \varepsilon.$$

The bundling variables are indicators with a value of 1 if the 8-K report includes both voluntary and mandatory items (likelihood of bundling); 1 if the form includes positive voluntary news and negative mandatory news (positive voluntary and negative mandatory columns); 1 if the 8-K report includes negative voluntary news and positive mandatory news (negative voluntary and positive mandatory columns); 1 if the 8-K report includes voluntary news and mandatory news with conflicting signs (disagreement between voluntary and mandatory columns). All other variables are defined in Appendix 3. The regressions are estimated using Logit and include year and Fama and French (1997) industry classification fixed effects. The standard errors correct for firm clustering. ***, **, and * denote two-tailed significance at the 1, 5, and 10 % levels, respectively

likelihood of bundling increases with firm size, number of segments, and equity return volatility, indicating that larger firms and firms with greater operational uncertainty are more likely to bundle news.[22]

Taken together, the evidence in Table 5 is consistent with the evidence in Tables 3 and 4. Public firms are more likely to strategically report, either through disclosure timing or news bundling. Also, firms that tend to strategically report negative news through disclosure timing are also more likely to do so through news bundling.

4.4 Market reaction to strategic reporting through disclosure timing

The previous subsections provide evidence that public firms tend to report negative news ATH and ATH on LTD. A plausible explanation for this reporting strategy is that firms seek to mitigate market reaction to negative news by releasing the news when investors' attention is supposedly lower. A challenge to this hypothesis is that markets are generally considered to be efficient, and therefore the reaction to the news would be immediate and full, regardless of when the news is disclosed. The only difference would be the timing of the reaction; that is, if the negative news is disclosed non-ATH (ATH), then investors will react fully to the news on the same (following) trading day. Hence, in this section, we examine whether investors do in fact underreact to negative news disclosed strategically.

However, simply examining the association between market returns and strategic news reporting is likely to indicate that market reaction to news disclosed strategically is *more* negative simply because firms tend to report more negative news strategically. In other words, since firms report negative news ATH, market reaction is likely to be more negative for news reported ATH. To address this issue, we take advantage of the richness of the data and restrict the sample to forms with a priori negative news (as discussed above in the sensitivity analysis in Sect. 4.1). We then examine whether investors under-react to negative news disclosed strategically.[23]

Table 6, Panel A, shows descriptive statistics related to the selected negative items. The abnormal return column shows the mean abnormal returns for each item. We calculate abnormal returns on the date of filing if the 8-K is filed non-ATH and on the following trading day if the form is filed ATH. With the exception of Item 1.02 and Item 4.01, abnormal returns are negative and highly significant as expected. The next three columns show the proportion of forms filed ATH, LTD, and ATH on LTD, respectively. Consistent with strategic disclosure of negative news, the columns show that the likelihood of strategic disclosure of these items is

[22] One potential concern with our measure of strategic reporting is that it may be noisy in the early years of the data because of the smaller number of observations. To address this issue we measure strategic reporting using all of the data. While this measure is less noisy, the analysis involves look-ahead bias. Nevertheless, the results are similar to those reported—the likelihood of news bundling increases with strategic reporting through disclosure timing.

[23] To ensure that the analysis is not contaminated by the presence of additional items reported in the form, we include only single-item forms. In a sensitivity analysis, we remove this restriction and examine all forms including multi-item filings. None of the inferences change.

Table 6 Market reaction analysis

Panel A: *Descriptive statistics*

Item	Obs	Abnormal return (%)	Proportion ATH	Proportion LTD	Proportion ATH on LTD
D_102	972	−0.285	0.560	0.200	0.107
D_204	276	−1.518***	0.674	0.243	0.167
D_206	315	−0.883***	0.619	0.267	0.143
D_301	2901	−1.801***	0.661	0.296	0.213
D_401	1828	−0.129	0.571	0.237	0.119
D_402	566	−1.010***	0.670	0.224	0.152
Average		−1.01 %***	62.13 %	25.51 %	16.19 %

Panel B: *Difference in return*

	After trading hours (ATH)		Last trading day (LTD)		ATH on LTD	
	Diff in news	Diff in returns (%)	Diff in news	Diff in returns (%)	Diff in news	Diff in returns (%)
D_102	0.001	0.293	0.001	−0.133	−0.001	0.860
D_204	0.005**	0.766	0.002	0.019	0.009**	1.209
D_206	−0.001	0.110	0.000	−0.032	−0.012***	2.613
D_301	0.000	0.342	−0.004***	0.525	−0.003***	0.555
D_401	0.001	0.362	0.005***	0.407	0.010***	0.852
D_402	0.000	−2.940***	−0.003	−3.637***	0.002	−1.811**
Average	0.000	0.098	0.000	0.070	0.000	0.549

Table 6 continued

Panel C: Regression of return on proxies for reporting strategy

	Abnormal returns	3-day CAR	Abnormal returns	3-day CAR	Abnormal returns	3-day CAR
Constant	−0.027	−0.040*	−0.029	−0.038	−0.041	−0.045
	(0.273)	(0.068)	(0.340)	(0.144)	(0.344)	(0.243)
Form_News	−0.138	−0.031	−0.047	0.076	−0.079	0.171
	(0.211)	(0.842)	(0.735)	(0.666)	(0.503)	(0.293)
After trading hours (ATH) indicator	−0.002	−0.004				
	(0.451)	(0.324)				
Last trading day (LTD) indicator			−0.001	−0.001		
			(0.853)	(0.732)		
ATH on LTD indicator					−0.005	−0.005
					(0.110)	(0.276)
Observations	3888	3888	2922	2922	1918	1918
R-squared	0.022	0.014	0.024	0.020	0.042	0.036

The analysis of the relation between disclosure strategy and equity returns. Panel A provides descriptive statistics related to selected 8-K items, which provide negative news. Abnormal return is the abnormal return on the filing date if the form was filed non-ATH or the abnormal return on the following trading day if the form was filed ATH. Proportion ATH, proportion LTD, and proportion ATH on LTD are the proportions of 8-K reports containing the specific item reported ATH, LTD, and ATH on LTD, respectively. Panel B shows univariate statistics on the difference in news and abnormal returns for the proxies for disclosure strategy. The ATH columns show the difference in news and market reaction between the return on forms that were filed ATH and matched forms from the control sample. The control sample includes forms that were reported non-ATH and not on LTD. The LTD (ATH on LTD) columns show the differences between the forms that were filed on LTD (ATH on LTD) and matched forms from the control sample. Panel C provides the regression results. We estimate the following regression model

$$Return\ Variable = a0 + a1 \times Form\ News + a2 \times Timing\ Indicator + Year/Item/Industry\ Fixed\ Effects + \varepsilon.$$

The return variables are abnormal return and the 3-day CAR. The timing indicator is the ATH indicator, LTD indicator, and ATH on LTD indicator. The regressions are estimated using OLS. The standard errors correct for firm clustering. ***, **, and * denote two-tailed significance at the 1, 5, and 10 % levels, respectively

higher relative to the population of 8-K forms. For example, the average proportion of ATH (LTD) reporting is 62 % (25.5 %) compared with an average of 51 % (21 %) for all forms (see Table 1, Panel B). Importantly, the proportions indicate that there is variation among the disclosure strategy variables across the various items. This variation allows us to examine whether indeed firms can mitigate the expected negative market reaction through the strategic timing of the reporting of negative news.

While focusing on a priori negative news addresses the concern that negative news is typically disclosed strategically, the decision to disclose ATH or LTD of an a priori negative event may depend on the severity of the event. For example, firms could choose to report more negative news concerning impairments ATH to give investors more time to digest the news. Hence this suggests that one cannot compare investors' reaction to news reported ATH with news reported non-ATH without controlling properly for differences in the severity of the news. To this end, we use matched sample research design. Specifically, we define all forms with a priori negative news that were reported non-ATH on any day of the week except LTD as the control sample. We then match, within each of the a priori negative news items, each observation reported ATH during the same year with an observation from the control sample with the closest news score. That is, for each of the negative items, we create a matched sample of observations reported ATH with observations reported non-ATH on any day of the week except for LTD. We repeat this process, matching forms that were reported LTD or ATH on LTD.

Table 6, Panel B, shows the mean difference in the news score and abnormal returns for each of the three matched samples. The ATH columns show the difference in news and abnormal returns between forms that were filed ATH and the matched forms. The overall differences are not significant, indicating that there is no difference in the news or returns across disclosure timing venues. With the exception of Item 4.02, the differences in returns across items are also not significant. The difference in returns for Item 4.02 is negative and significant (p value <0.01), implying a *more* negative market reaction to ATH filing. The differences in the news score are also not significant except for Items 2.04, where the positive difference indicates that the less negative news are reported ATH. The results are similar for the LTD and ATH on LTD matched samples. In particular, there is no difference in the overall abnormal returns between the disclosure timing categories and no significant difference in returns for all items, except for Item 4.02, where the market reaction is more negative when the news is reported LTD or ATH on LTD. While there are some differences in the news score across the various items, there is no discernable pattern in the differences, and the overall difference in the news is not significant, indicating that we can eliminate differences in news score as a potential explanation for the results concerning the differences in returns.

Table 6, Panel C, presents the regression results of abnormal returns on the proxies for strategic reporting—ATH, LTD, and ATH on LTD indicators for each of the respective matched samples. We also control for the news score to control for remaining differences in news within the same items, and for item, industry, and year fixed effects. The regressions are estimated using OLS with robust standard error clustered by firm. We supplement the analysis with cumulative abnormal

returns in the 3 days centered on the first trading day where the news is at the public domain. Consistent with the univariate results, none of the coefficients on the timing indicators is significant, indicating that strategic disclosure of negative news does not result in a less negative market reaction.

In summary, we find no evidence that strategic disclosure leads to underreaction; the timing of reporting negative news is irrelevant as far as investor reaction is concerned, as predicted by market efficiency theory.

4.5 Additional analyses

4.5.1 Disclosure timing

The analyses so far implicitly assume that the news in the 8-K form arrives to the market first via the 8-K form. However, given that the filing may be done within four business days of the reportable event, firms may release the news via press release before filing the 8-K. In this case, the analysis may be incorrect because the timing of the news release via the early press release can differ from the timing of the 8-K release. To address this issue, we obtain the press release data used by Neuhierl et al. (2013) for 2010. They examine market reaction to press releases to various types of news. The data includes the date and time stamp of the press release.

The 8-K sample for 2010 contains 19,697 reports issued by public firms. We merge the 8-K data with the press release data and classify a release that was released in the 3 days centered on the 8-K filing date as a related press release. In other words, we assume that, if the company issued a press release in the 3 days centered on the 8-K filing date, then the release reports the information in the 8-K.

We find that of a total of 19,697 8-K reports, 6169 are accompanied by a related press release (1612 issued on $t - 1$; 3674 issued on date t; and 883 on date $t + 1$; date t is the 8-K filing date). In other words, for 69 % of the 8-K cases, the market could learn of the information only from the 8-K filing. The proportion is clearly much higher if we consider nonpublic firms as well.

Our main proxy for strategic disclosure is the disclosure of negative news ATH. Hence, for this analysis, the important issue is to examine whether the timing of any preceding PR release (i.e., non-ATH or ATH) differs from the timing of the subsequent 8-K, which is the one used in this study. We measure error in timing classification as follows. We compare the release timing of the press releases that were issued on date $t - 1$ with the release timing of the 8-K. We find that in 968 cases there is a reporting conflict; that is, the release was released ATH (non-ATH), whereas the 8-K form was released non-ATH (ATH). In addition, we compare the release timing on date t. We find that in 873 cases the 8-K report was released ATH whereas the press release was released non-ATH; that is, the release preceded the 8-K. Together, the total number of error cases is 1841 (about 9 %).

To examine whether the results are sensitive to the error in classification, we use the 2010 data and estimate the disclosure timing regressions once using the entire 8-K data for 2010 and once when we exclude the error cases. Untabulated results show that the results for 2010 are similar to those in Table 3; the coefficient on the

news variable is negative and significant, indicating greater likelihood of ATH reporting when the news is negative. More importantly, the classification error has little impact—the magnitude and significance of the news coefficient is similar when we exclude the error cases.

We also examine whether errors in classification and in the identification of the exact date when the news become public affect the return analysis. Before we describe the analysis, note that we report the results using 3-day CAR, thereby mitigating the impact of error in identifying the exact time where the news became public. Further, given that the return analysis in this study focuses on a priori negative news, the number of error cases is much smaller—12 cases out of 214 a priori negative news forms. Replicating the regressions in Table 6, Panel C, we find that the coefficient on the ATH indicator is not significant and that the exclusion of the error cases does not affect the conclusion from the analysis.

Taken together, while we find that for the majority of 8-K cases in our sample the news was disseminated first via 8-K reports, there are errors in the data. Yet further analyses indicate that these errors do not affect the inferences from the strategic disclosure and return analyses.

As another sensitivity analysis, we restrict the sample to 8-K forms that elicited abnormal equity returns greater than 1 % in absolute value on the first day the news became public. That is, if the news is released ATH (non-ATH) on day *t*, we include in the sample forms where the absolute value of abnormal returns on day t + 1 (day t) is greater than 1 %. This procedure likely ensures that the 8-K report was not preceded by a press release. Replicating the analysis in Table 3, we continue to find that the likelihood of strategic reporting increases with the negativity of the news.

4.5.2 Positive news

The discussion related to the disclosure timing thus far has focused exclusively on negative news. We complement the analysis by examining whether firms highlight positive news by disclosing it before market opens or during trading hours (non-ATH), and whether the reaction to positive news is heightened when the news is disclosed when markets are open.

Untabulated results indicate that public firms are more likely to report positive news non-ATH than nonpublic firms. In addition, the overall likelihood of positive news reporting non-ATH is positive and significant. These results are consistent with the capital market pressure hypothesis, which suggests that managers use disclosure strategy that would maximize (minimize) investors' reaction to positive (negative) news.

Similar to the arguments above, given the tendency of managers to disclose positive news non-ATH, it is expected that market reaction to news disclosed non-ATH would be more positive. To mitigate this issue when examining whether there is heightened market reaction to disclosure of positive news non-ATH, one has to identify a priori positive news and match forms reported non-ATH with forms reported ATH based on the news score. However, among the items reported on Form 8-K, only Item 3.02 "Unregistered Sale of Equity" is considered positive news ex ante (see Lerman and Livnat 2010). Since there are only 1300 8-K forms

with Item 3.02, the power of the test is likely low. To increase the power of the test, we also include Item 1.01 "Entry Into Material Agreement," which in our sample appear to provide positive and economically significant news on average (see Table 1, Panel C). While the number of forms reporting items 1.01 is much greater and the average reaction to these items is positive, about 50 % of the forms are classified as negative news events.

We use research design similar to the analysis above related to negative news, and match each observation reported ATH, LTD, or ATH on LTD with an observation reported non-ATH on any trading day other than the LTD. The results concerning the three matched samples are reported in Table 7. Similar to the results in Table 6, we find that the market reaction to positive news reported when investor attention is low is not significantly different except for one-day abnormal return ATH regression. We observe that the coefficient on ATH is negative, indicating that positive news reported ATH elicits lower reaction. However, given that the coefficients are not significant in any of the other regressions, we conclude that highlighting positive news by reporting it during trading hours or before the market opens would overall not affect investors' reaction, again consistent with market efficiency.

5 Summary

This study investigates reporting strategies of corporate events using Form 8-K filings. We test whether firms strategically disclose mandatory and voluntary information. Going beyond the ubiquitous earnings announcements and their limitations, we investigate multiple dimensions of material events disclosures to determine whether firms are strategic in their disclosure timing of negative versus positive news or in bundling news items. Using a comprehensive set of material events filings (including information on nonpublic firms), we provide evidence relevant to the debate regarding limited attention, the effect of capital market pressure, and management incentives with respect to stock prices, trading days and trading hours, and the bundling of positive and negative news.

We find evidence of strategic reporting, especially in the case of public firms reporting negative news. We find that firms attempt to delay and obfuscate the disclosure of negative news, possibly to mitigate their potential negative market impact. In particular, public firms are more likely to disclose negative news after trading hours in general and on the last trading day of the week in particular. In addition, public firms are also more likely to report positive news with negative news, again to mitigate the negative reaction to the latter. However, we find no evidence that strategic disclosure via timing leads to investor underreaction.

The combination of these results is interesting. While managers are clearly timing the release of negative news to exploit perceived investor inattention, there is no evidence of this strategy bearing fruit. A possible explanation for this disconnect may be the absence of feedback on the effects of an alternative reporting approach or confirmation bias with respect to what managers observe.

Table 7 Market reaction to positive news

	Abnormal returns	3-day CAR	Abnormal returns	3-day CAR	Abnormal returns	3-day CAR
Constant	0.005	0.007	0.008	0.012	0.002	−0.005
	(0.132)	(0.101)	(0.219)	(0.103)	(0.744)	(0.459)
Form_News	0.072**	0.125**	0.037	0.071	0.045	0.093
	(0.014)	(0.026)	(0.328)	(0.252)	(0.283)	(0.224)
After trading hours (ATH) indicator	−0.003***	−0.002				
	(0.001)	(0.273)				
Last trading day (LTD) indicator			−0.001	−0.001		
			(0.271)	(0.616)		
ATH on LTD indicator					−0.001	−0.002
					(0.358)	(0.278)
Observations	15,594	15,594	8068	8068	4624	4624
R-squared	0.005	0.005	0.009	0.008	0.015	0.014

The analysis of the relation between disclosure strategy of positive news and equity returns. We estimate the following regression model

$$Return\ Variable = a0 + a1 \times Form\ News + a2 \times Timing\ Indicator + Year/Item/Industry\ Fixed\ Effects + \varepsilon.$$

The return variables are defined in the notes to Table 6. The timing indicator is the ATH indicator, LTD indicator, and ATH on LTD indicator. The regressions are estimated using OLS. The standard errors correct for firm clustering. ***, **, and * denote two-tailed significance at the 1, 5, and 10 % levels, respectively

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Appendix 1: Form 8-K items—number and description

Item description	Item number
Entry into a Material Definitive Agreement	1.01
Termination of a Material Definitive Agreement	1.02
Bankruptcy or Receivership	1.03
Mine safety—reporting of shutdowns and patterns of violations	1.04
Completion of acquisition or disposition of assets	2.01
Results of operations and financial condition	2.02
Creation of a Direct Financial Obligation or an Obligation under an Off-Balance Sheet Arrangement of a Registrant	2.03
Triggering Events That Accelerate or Increase a Direct Financial Obligation or an Obligation under an Off-Balance Sheet Arrangement	2.04
Costs associated with exit or disposal activities	2.05
Material Impairments	2.06
Notice of Delisting or Failure to Satisfy a Continued Listing Rule or Standard; Transfer of Listing	3.01
Unregistered sales of equity securities	3.02
Material modification to rights of security holders	3.03
Changes in Registrant's Certifying Accountant	4.01
Non-Reliance on Previously Issued Financial Statements or a Related Audit Report or Completed Interim Review	4.02
Changes in control of registrant	5.01
Departure of directors or certain officers; election of directors; appointment of certain officers; compensatory arrangements of certain officers	5.02
Amendments to articles of incorporation or bylaws; change in fiscal year	5.03
Temporary suspension of trading under registrant's employee benefit plans	5.04
Amendment to registrant's code of ethics, or waiver of a provision of the code of ethics	5.05
Change in shell company status	5.06
Submission of matters to a vote of security holders	5.07
Shareholder director nominations	5.08
Asset-backed securities	6.01–6.05
Regulation FD disclosure	7.01
Other events	8.01
Financial statements and exhibits	9.01

Appendix 2

Form 8-K data

We use the FTP access and Index files to download the entire universe of 8-K filings from the SEC's Electronic Data Gathering, Analysis and Retrieval online system (EDGAR) filed between the years 2005 and 2013.[24] We machine read the 8-K forms to identify and extract the information in the form. Edgar filings contain in the header section of the form a submission date-and-time stamp (YYYYMMDDHHMMSS), submission type (form type, e.g., 8-K), Filed As of Date (filing date), and several company identifiers including company name, central index key (CIK), SIC code, IRS number, and address. We further identify the beginning and end of all reported items in the body of the form based on their captions and extract their text. Finally, we count total words as well as financial positive and financial negative words in each item text, based on the Loughran and McDonald (2011) word lists described below.

Textual analysis

Textual analysis has been widely used in the literature to identify and classify the sentiment of text. In a recent paper, Kearney and Liu (2014) provide a detailed survey of the textual sentiment literature and describe the information sources analyzed and content analysis methods. Textual analysis has been used to examine the tone of press releases (Davis et al. 2012), analysts reports (De Franco et al. 2015), management discussion and analysis in 10-Ks (Feldman et al. 2010), and annual reports (Lehavy et al. 2011), to name a few.

A growing recent literature uses the Loughran and McDonald (2011) word lists, a modified version of the Harvard dictionaries, to identify the tone of the news. Loughran and McDonald created a list of financial-negative and financial-positive words based on a comprehensive sample of 50,115 firm-year 10-Ks filed between 1994 and 2008. In particular, they map all the words in their 10-K sample, and they examine words occurring in at least 5 % of the documents to determine their most likely usage and classification in financial documents. They include inflections and take into account negation when constructing their final word lists. They produce a list of 2337 words in their financial-negative category (e.g., loss, impairment, decline) and 353 words in their financial-positive category (e.g., achieve, attain, efficient, improve, profitable).[25] Some papers focus on the negative word lists only (e.g., Chen et al. 2014) or on both positive and negative terms (e.g., Garcia 2013), while others (e.g., Hanley and Hoberg 2010), including this manuscript, use "net sentiment," defined as the difference between the proportion of negative and

[24] For information on EDGAR FTP access and use of EDGAR Index files, see https://www.sec.gov/edgar/searchedgar/ftpusers.htm.

[25] Complete lists of positive and negative words can be downloaded from Bill McDonald's website: http://www3.nd.edu/~mcdonald/Word_Lists.html.

positive words based on the Loughran and McDonald word lists.[26] Specifically, for each of the 8-K forms we compute Form News as the difference between the total number of positive and negative financial words and then scale the difference by the total number of words. We compute voluntary and mandatory news similarly. Voluntary news is computed as the difference between the number of positive and negative financial words in Item 8.01 scaled by the total number of words in the item. Mandatory news is computed as the difference between the number of positive and negative financial words in all other items scaled by the total number of words in the corresponding items.

Appendix 3

Variable definition

Three-day cumulative abnormal returns—Abnormal returns are computed based on Carhart (1997) four-factor model. The CAR is centered on the first day investors could trade on the information. Specifically, if the news is disclosed non-ATH (ATH), we use CAR centered on the filing date (day following the filing date).

After Trading Hours (*ATH*)—an indicator with 1 if the 8-K form is filed after trading hours (4 p.m.–12 a.m.).

After Trading Hours on Last Trading Day (*ATH on LTD*)—an indicator with 1 if the 8-K form is filed after trading hours on the last trading day of the week.

Eastern Time Zone Indicator—an indicator with 1 if the firm headquarters are located either in the Eastern or Central time zone.

Form News—the news score obtained using the Loughran and McDonald (2011) financial-positive and financial-negative word lists; for each form, we compute the difference between the number of positive and negative financial words and scale the difference by the total number of words in the form.

Institutional Ownership—percentage of common shares held by institutional investors at fiscal year-end.

Last Trading Day (*LTD*)—an indicator with 1 if the 8-K form is filed on the last trading day of the week.

Log Market Value—natural log of market value of equity at fiscal year-end.

Mandatory News—News score calculated similar to Form News, over all items in the form except Item 8.01.

Number of Analysts—number of analysts who provided at least one forecast of next period earnings during the year.

Number of Items—number of unique items reported in the 8-K form.

Number of Segments—number of business segments.

Public Company Indicator—indicator with 1 if the firm shares are publicly traded (appear on CRSP).

[26] For a comprehensive review of papers using the LM measure and related literature, see Loughran and McDonald (2015).

Standard Deviation of Daily Return—computed based on daily stock returns during fiscal year.

Strategic Reporting—the total number of negative news forms reported after trading hours or on the last trading day of the week from the beginning of the sample period through the beginning of the year, scaled by the total number of 8-K form with negative news reported in the same period.

Voluntary News—News score calculated similar to Form News, over Item 8.01 only.

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