The Disappearing Earnings Announcement Premium*

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Abstract

The earnings announcement premium, whereby a stock earns abnormal returns over its earnings announcement period, has been the subject of extensive research. We provide the first evidence that this premium has disappeared in the US in recent years. We theorize that the increased filings of material information (Form 8-K) due to a regulatory change is responsible for this disappearance. Information traditionally contained in earnings announcements is now preempted by 8-K filings, and the announcement premium has shifted to 8-K filing dates. These results are consistent with our information uncertainty resolution model and inconsistent with attention-based behavioral explanations.

Keywords: Earnings announcement premium, Disclosure, 8-K filings.
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1 Introduction

Historically, stock prices behave in a predictable fashion over firms' earnings announcement windows. Unconditional on the information contained within the announcements, stocks earn higher returns on earnings announcement days, as compared to non-announcement days. This premium, referred to as the earnings announcement premium (EAP), is among the earliest documented stock market anomalies. First identified by Beaver (1968), it has subsequently been reported by Chari et al. (1988), Ball and Kothari (1991), Frazzini and Lamont (2007), and Savor and Wilson (2016), among others. A monthly trading strategy exploiting this premium has earned excess returns between 7% and 18% on an annualized basis with Sharpe ratios larger than those of several other popular anomalies (Frazzini and Lamont, 2007). Despite the fact that several recent studies have questioned the robustness of other anomalies (Harvey et al., 2016; Linnainmaa and Roberts, 2018; McLean and Pontiff, 2016; Hou et al., 2017; Green et al., 2017), the EAP has been shown to remain resiliently robust (Hou et al., 2017).

We present the first evidence that this long enduring anomaly has disappeared from the US markets in recent years. Compared to an average weekly portfolio excess return of 43 bps (32 bps FF adjusted) over a 10-year period prior to 2004, the earnings announcement portfolio weekly return is 40 bps lower (24 bps FF adjusted) in the period after 2004. In cross-sectional tests (treating each firm announcement as a separate observation), the average abnormal announcement returns are 36 basis points (27 bps FF-adjusted) lower after 2004.

In this study, we identify the enhanced real-time disclosures of the 2004 Disclosure Regulation as a possible cause for the disappearance of the EAP. In response to the accounting scandals in the early 2000s, as part of the Sarbanes Oxley Act, Congress enacted new rules legislating increased use of real-time disclosures by corporations. The SEC implemented these legislative changes effective August 23, 2004 as additional reporting requirements for 8-K filings (Lerman and Livnat, 2010).[1] Following this implementation, the frequency of

[1] A firm can file an 8-K following one or more material events. These include the signing, amending or termination of material contracts, bankruptcies, senior officer and director appointments and departures, etc. Appendix A outlines 8-K sections and the types of events covered by the disclosure.

8-K filings increased dramatically. More importantly, the Disclosure Regulation mandated the filing of 8-Ks in a timely fashion (within four days) following the occurrence of material events (Noh et al., 2018).

We first show that 8-K filings are accompanied by an additional 32 bps excess return suggesting that they indeed contain material information about the firm. Second, the volatility of returns around 8-K filing dates has increased significantly relative to the pre-2004 period. These changes in 8-K return patterns indirectly suggest that 8-Ks contain information that could have historically been conveyed by earnings announcements. In direct tests of this preemption, we find that the earnings announcement returns are inversely related to the 8-K filing returns. Moreover, the 8-K filings occur on random dates that are staggered across companies. Fama et al. (1969) argue that such randomness lends itself to causal inference similar to that of event studies. Given the inherent difficulty in predicting returns, the presence of such a relationship between 8-K returns and announcement returns provides strong evidence of preemption.

We also consider several potential alternatives for the disappearance of the premium related to learning and market structure. The learning hypothesis posits that investors learn about anomalies following academic publication and the consequent increased arbitrage leads to the disappearance of the anomaly (McLean and Pontiff, 2016). With respect to the EAP, the extended elapsed time between the first related academic publication in 1968 (Beaver, 1968) and eventual disappearance in 2004 does not appear to support this hypothesis.

The market structure arguments rely on the marked changes in trading behavior over the past two decades. In the early 2000s, high-frequency trading (HFT) accounted for fewer than 10% of equity orders, but this proportion soon increased rapidly worldwide. According to data from the NYSE, trading volume due to HFT grew by about 164% between 2005 and 2009.[2] The HFT trend is not just restricted to US markets. In 2010, HFT had grown to make up 56% of equity trades in the US and 38% in Europe.[3]

[2]Duhigg, Charles (July 23, 2009). "Stock Traders Find Speed Pays, in Milliseconds". New York Times. Retrieved Sep 10, 2010.

[3]Grant, Justin (Sep 2, 2010). "High-frequency trading: Up against a bandsaw". Financial Times. Retrieved Sep 10, 2010.

International markets, thus, offer a setting to examine whether worldwide trends in investor trading behavior can explain the disappearance of the earnings announcement premium. Barber et al. (2013) document the robustness of the anomaly in nine non-US countries. We examine the robustness of the EAP in these nine countries, and it is still present after 2004 in all nine markets. For example, after 2004 in the UK, the market-adjusted premium in the earnings announcement week remains economically large at 88 bps. Therefore, worldwide international trends related to trading technologies or investor behavior, such as the rise of HFT, are unlikely to explain this disappearance in US markets.

The international evidence appears to rule out worldwide trends in investor behavior and trading frictions. However, US-specific changes to trading frictions like Decimalization and Reg NMS have also been hypothesized to contribute to the disappearance of anomalies in general (Chordia et al., 2014). Considering a shorter time period when the SEC rolled Decimalization in a staggered fashion, we find no differences in EAP between firms subject to decimilazation and the control firms. Additionally, exploiting the natural experiment conducted in US markets where a set of firms were de-decimalized from 2016-2018 (Chen et al., 2017), we find no difference in the EAP for de-decimalized stocks and non-de-decimalized stocks. suggesting that (removal of) trading frictions like higher tick size are unlikely, by themselves, to have led to the disappearance of the earnings announcement premium.[4]

The disappearance of the EAP provides an ideal setting to examine why it existed in the first place. Prior studies have attributed the earnings announcement premium to either information-based uncertainty (Ball and Kothari, 1991; Savor and Wilson, 2016; Barber et al., 2013) or limited attention (Frazzini and Lamont, 2007). Under the information-based theories, uncertainty about upcoming earnings depresses prices, and the earnings announcement resolves the uncertainty leading to a premium. Under the limited attention theory, certain classes of investors only pay attention and buy stocks surrounding their earnings announcement and such buying pressure leads to the earnings announcement premium (Frazzini

[4]It is not possible to rule out Reg NMS as an explanation by just examining time trends since Reg NMS was promulgated around the same time as the Disclosure Regulation. However, our cross-sectional tests regarding filers and nonfilers serve to provide added corroboration for 8-K filings being the cause rather than Reg NMS since ex-ante there is no reason to believe that filers are affected differently from nonfilers by Reg NMS.

and Lamont, 2007; Chapman, 2018).

We expand on these theories to incorporate the effect of 8-Ks and derive cross-sectional predictions on the effect of the earnings announcement premium. Under the information-based theory, earnings announcements resolve uncertainty. If 8-Ks preempt information in earnings announcements that resolve uncertainty, the premium would shift to the 8-K filing dates from the earnings announcement dates. According to the limited attention theory, if investors attention only increased during earnings announcement periods, such a shift to the 8-k dates would not happen. If we relax the assumptions of the limited attention theory and allow for the possibility that the act of 8-K filing (not the information in the filing) can garner investors' attention, then it is still possible that such enhanced investors' attention can result in a premium around 8-k filing dates and attenuate the premium around the earnings announcement for the filing companies. The observed premium during 8-K announcements documented above can therefore be consistent with both the uncertainty-based theory as well as the limited attention theory (with the relaxed assumption).

It is, however, possible to distinguish between the two theories by examining firms that do not have 8-K filings (nonfilers). The main feature of the uncertainty-based model is that, before 2004, nonfilers could still possess material information that they elect not to disclose. The theory therefore predicts that pre 2004, we will observe the EAP only for the nonfilers. Similarly, the limited attention theory also predicts that the EAP will be observed only for the nonfilers (since there is no preemption of attention by an 8-K filing for the nonfilers). However, the uncertainty and attention hypotheses offer different predictions for nonfilers post 2004. For firms that do not file an 8-K after 2004, the resolution of information uncertainty hypothesis predicts no EAP, whereas the limited attention theory predicts a continuation of the earnings announcement premium.[5] These differential predictions for filers and nonfilers also help to rule out several alternative explanations for the disappearance (like

[5]In our model, we treat limited attention as a behavioral trait (leading to market inefficiency), which is unrelated to information revelation. It is possible that firms with more information garner greater media attention. However, we do not consider such information-based media attention to be a purely behavioral trait, since no test can distinguish between information-based and attention-based theories if we allow attention to also be affected by information.

trading behavior, investor learning) which, we have no $ex-ante$ reason to believe will vary between filers and nonfilers.

Comparing 8-K filers and nonfilers, we find that the earnings announcements of 8-K filers have an insignificant EAP even in the pre-2004 period. We also show that the EAP decreases with the informativeness of firms' 8-K filings.[6] There is a significant negative relationship between the total returns realized on 8-K filing dates and earnings announcement returns. The relationship does not change materially after 2004 despite the increased number of 8-Ks. Overall, these results are consistent with model predictions that the pre-2004 EAP is attributable to nonfilers. Subsequent to the regulation, the earnings announcement premium vanishes for both filers and nonfilers, as all firms with information had to file an 8-K. Given that nonfilers demonstrate no earnings announcement premium in the post-2004 period, our findings support the resolution of information uncertainty rather than the limited attention theory.

In our model, pre 2004, we distinguish between filers (type A firms), nonfilers with material information (type B firms), and nonfilers without material information (type C firms). The uncertainty-based theory predicts an EAP for B and C firms, since the market cannot distinguish between them. We argue that following the regulation, B firms will become filers, enabling the market to distinguish between B and C firms. We attempt to $ex-post$ distinguish between these types of firms by categorizing pre 2004 below median 8-K filers into two groups based on their filing frequncy post 2004. Post 2004 above (below) median filers are classified as B (C) firms. Our theory suggests that both B and C firms will exhibit the EAP pre 2004 but not post 2004. Indeed, we find pre 2004 EAP of 56 bps (47 bps) and post 2004 EAP of -6 bps (1 bp) for C firms (B firms).

We augment our cross-sectional filer/nonfiler tests with direct tests of the limited attention hypothesis by employing two empirical measures of investor attention from DeHaan et al. (2015): SEC EDGAR downloads and the speed of analyst revisions. If limited attention is a

[6]Noh et al. (2018) document a decrease in management guidance along with an increase in 8-K filings post 2004. Typically, management guidance is bundled with earnings announcements. We note that 8-Ks substituting for guidance only serves to bias against our finding of a preemption effect of 8-Ks.

cause of the earnings announcement premium, these measures should be positively related to the premium. Additionally, we should observe a decline in the magnitude of these measures post 2004. We find that these measures are negatively related to the premium and that their magnitudes increased post 2004. Therefore, limited attention is unlikely to have been a cause of the premium in the first place.

With only information uncertainty as a viable alternative, we seek to distinguish between the two primary information uncertainty-related reasons hypothesized for the existence of the earnings announcement premium. Barber et al. (2013) attribute the premium to an increase in idiosyncratic risk due to uncertainty of firms' earnings information, whereas Savor and Wilson (2016) and Patton and Verardo (2012) attribute it to an increase in systematic risk due to positive covariance of earnings announcers' news with market-wide news. To directly examine which type of information-based uncertainty – systematic or idiosyncratic – is resolved by the 8-K filings, we examine the effect of systematic and idiosyncratic proxies pre- and post-2004.

For systematic risk, we follow the procedure used by Patton and Verardo (2012) and use weekly data to measure stock betas ($Announce\beta$) in narrow windows around earnings announcements. We, however, find no change in $Announce\beta$ post 2004. Since Savor and Wilson (2016) argue that traditional return covariance with a market portfolio may not capture all systematic risk, we also conduct tests on the ability of the earnings announcement premium to predict future aggregate earnings. We find that the ability of the premium to explain future aggregate earnings has increased post 2004. Our evidence suggests that it is unlikely that decreased systematic uncertainty resolution lead to a decline in the premium post 2004. For idiosyncratic uncertainty, we adopt a measure of idiosyncratic volatility employed by Ang et al. (2006) and Barber et al. (2013). We find a decline in the magnitude of idiosyncratic volatility post 2004. Consequently, it appears that idiosyncratic volatility, rather than systematic volatility, was the likely cause behind the EAP.

In summary, we show that a long enduring anomalous puzzle in the equity markets has disappeared in recent times. The continuing international robustness of the premium narrows the attribution of the disappearance to a US-specific cause. We identify the 2004 Disclo-

sure Regulation affecting 8-K filings as a likely cause for the disappearance of the earnings announcement premium. While prior studies document an increase in 8-K filings (Lerman and Livnat, 2010) and find that intra-period timeliness of the incorporation of information into stock prices has improved following the 2004 Disclosure Regulation (Noh et al., 2018; McMullin et al., 2018), they do not examine the preemption of the earnings announcement premium by 8-K filings or the mechanism by which such preemption occurs. We also consider and rule out several potential explanations for the disappearance. Focusing on why the premium existed in the first place, our evidence supports an uncertainty-based, rather than a limited-attention based, explanation for the premium.

Our findings have significant policy implications as well. To the extent that the information in the 8-Ks is being impounded into individual and aggregate stock prices in a timely fashion, the disclosure requirements improve price discovery. The disclosure regulation, therefore, appears to enhance market efficiency and, by extension, improve capital allocation in the economy.

2 Background

In this section, we first discuss the background literature on the earnings announcement premium, as well as the filing of 8-Ks and the 2004 Disclosure Regulation that altered their nature. We then make the case for why the changing nature of 8-K filings has the potential to impact the earnings announcement premium.

2.1 Earnings announcement premium

Firms regularly schedule announcements of quarterly financial results. It is now well known that these announcements, labeled earnings announcements, cause substantial price volatility and are associated with substantial increases in volume. Both these effects were first documented by Beaver (1968). In addition, stock prices on average rise after these earnings announcements. This earnings announcement premium was studied by Chari et al.

(1988), Ball and Kothari (1991), and Cohen et al. (2007). Beaver (1968) documents that the magnitude of price changes during earnings reporting periods was significantly larger than during non-reporting periods and attributed it to the notion that earnings reports convey potentially useful information for investors. Subsequently, Chari et al. (1988) show that the higher abnormal returns and higher variability of returns around earnings announcements was concentrated in small firms. Ball and Kothari (1991) hypothesize that the earnings announcement premium can be attributed to risk increases during announcement periods. Using pooled tests, they document a 0.067 increase in average beta during the three-day announcement period. Patton and Verardo (2012) use high frequency data, and similar to Ball and Kothari (1991), document an increase in market beta around earnings announcements. They further show that the increase in beta is more pronounced for early announcers as opposed to late announcers within a given reporting period.

Savor and Wilson (2016) also argue that the earnings announcement premium is driven by uncertainty regarding market-wide information. In addition, they document a larger premium for early, rather than late, announcers. However, similar to Ball and Kothari (1991), they argue that the increase in market beta is not sufficiently large to explain the premium. As such, they attribute the market wide uncertainty to effects not captured by estimated market beta.

Barber et al. (2013) extend the earnings announcement premium literature globally by examining whether cross-country variations in the magnitude of its effect could shed light on potential explanations. They find that the phenomenon is robust internationally and appears to be driven by idiosyncratic, rather than market-wide, volatilities.

Aside from the information uncertainty-based explanation presented so far, behavioral explanations for the phenomenon have also been advanced. Frazzini and Lamont (2007) argue that market participants have limited attention. The earnings announcement premium is therefore a manifestation of the increased investor attention that a stock receives during its earnings announcement period. The evidence in Barber et al. (2013), however, is inconsistent with limited attention theories.

2.2 New Disclosure Requirements for Form 8-K

The SEC requires public companies to file reports of material events in a timely fashion. By filing Form 8-K, companies alert shareholders of potentially significant events (see Appendix A for a complete list). On August 23, 2004, as part of the Sarbanes Oxley Act, Congress mandated the use of real-time disclosures by companies. Previously, the filing deadline for an 8-K form was between five and 15 business days, depending on the item (Lerman and Livnat, 2010). However, the new legislation required companies to disclose all material events within four business days. It also increased the number of 8-K items from 12 to 22 and required both positive and negative news to be disclosed.

After the law went into effect, the number of 8-Ks that firms file has gone up (Lerman and Livnat, 2010), and the filings have become timelier. Li (2013) documents that, prior to the regulation, over 20% of firms within his sample waited more than 220 days to file material contracts with the SEC and typically elect to include the information in their 10-K and 10-Q forms instead. Post regulation, Lerman and Livnat (2010) find that nearly 95% of mandatory 8-K filings meet the four business day disclosure requirement.

The law has also made the content of 8-K forms more informative. Lerman and Livnat (2010) find abnormal volume and return volatility around both the event and SEC filing dates, indicating that there is information contained within these forms. Despite more timely and expansive 8-K requirements, they find that the information content of these reports has not diminished and suggest that investors may use these filings to interpret the effects of the material events. McMullin et al. (2018) show that after the regulation, price formation improves and that firms with the largest increases in mandatory disclosure experience the greatest improvements in price formation.

After the legislation was enacted, there is evidence suggesting that Form 8-K became a substitute for other sources of firm information, including 10-K/Q filings, voluntary guidance, and earnings news. Before the 2004 regulation, firms were able to postpone the reporting of material events until quarter-end and include the new information in their 10-K/Q filing (Li, 2013). Furthermore, reporting requirements and enforcement prioritized mandatory

disclosures of negative news as compared to positive news (Kothari et al., 2010), though the 2004 regulation was designed to eliminate this asymmetry. Noh et al. (2018) show that mandatory 8-K filings act as a substitute for voluntary guidance, and this relationship is strengthened after the regulatory change. Their results also indicate that after 2004, there was an asymmetric increase in the extent to which 8-K filings substituted for good news relative to bad news guidance.

We analyze the regulatory filing environment of three countries besides the US: UK, France, and Germany. The SEC's EDGAR filing repository equivalents in the three countries are: Companies House, InfoGreffe, and BaFin, respectively. In the UK, the Companies Act of 2006 replaced the Companies Act of 1985.[7] From a detailed reading of the Act, we only observed three newly imposed deadlines for filing with the registrar. These deadlines relate to auditor dismissal, redenomination of shares, and register of interests disclosed. However, the filing deadlines pertaining to other material information (change of directors, purchase of own shares, etc.), which varied from 14 to 30 days, were unaltered from 1985. Compared to the US deadline change to four days, the UK's filing requirement changes in 2006 appear less drastic. In France, Infogreffe introduced an online filing mechanism in 2008, which likely resulted in a timelier dissemination of material information. However, firms still had the option to file physically. More importantly, to the best of our knowledge, there were no corresponding changes to the filing deadlines in either France or Germany.

2.3 8-K filings and the Earnings Announcement Premium

In this sub-section, we further explore how 8-K filings, in general, and the 2004 Disclosure Regulation, in particular, have implications for the earnings announcement premium. The SEC requires registrants to provide 8-K filings for material events. As discussed earlier, prior to the 2004 Disclosure Regulation, 8-K filings were asymmetrically enforced (Noh et al., 2018). While there was a push to enforce the timely filing of 8-Ks for bad news material events, firms were allowed to push the reporting of good news material events to the 10-K/Q

[7] http://www.legislation.gov.uk/ukpga/2006/46/notes

filings. However, the 2004 Disclosure Regulation mandated the filing of *all* 8-Ks within a four-day period. We contend that this change in 8-K reporting has led to a preemption of material information well before the earnings release.

We present here a reduced-form model of an 8-K filing release and its empirically testable consequences for the earnings announcement premium. Besides showing how an 8-K filing can lead to an attenuation in the earnings announcement premium, the model also has differential predictions for whether the earnings announcement premium was due to a resolution of uncertainty (Savor and Wilson, 2016; Barber et al., 2013) or limited attention from market participants (Frazzini and Lamont, 2007; Chapman, 2018).

Prior to the 2004 Disclosure Regulation, assume there are three kinds of firms in the market place:

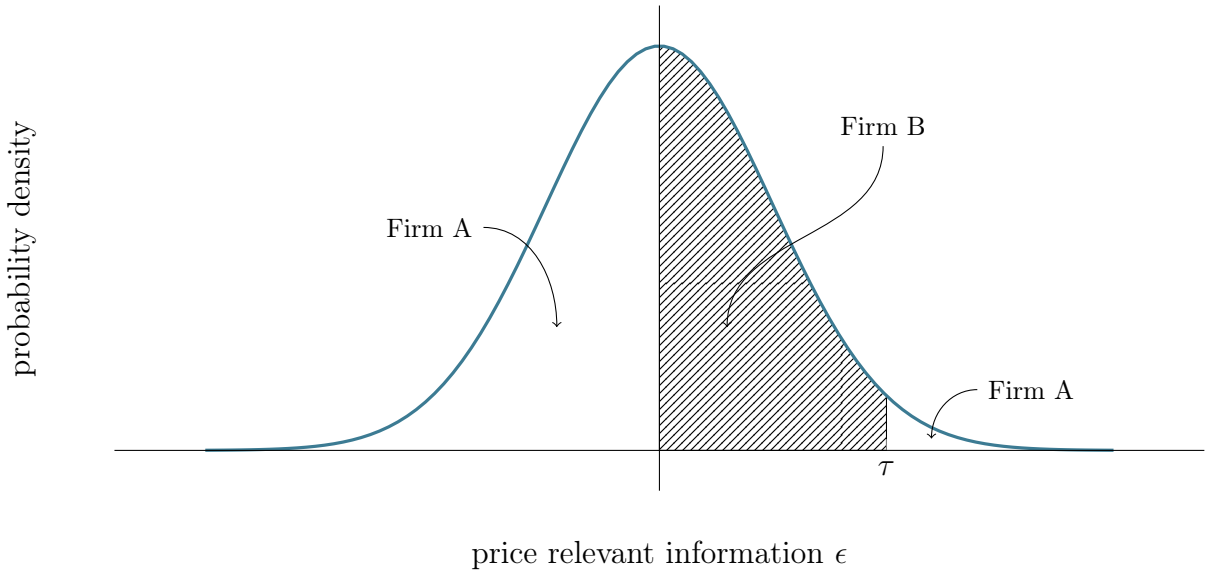
A. Firms with material events happening during a fiscal period and file 8-K reports.

B. Firms with material events happening during a fiscal period that do not file 8-K reports.

C. Firms with no material events during a fiscal period and consequently do not file 8-K reports.

The first theory we seek to test is that the non-reporting of material events in a timely fashion (8-Ks) and the resolution of uncertainty at the earnings release is responsible for the earnings announcement premium. Under this theory, firms in category A, who were 8-K filers, would have no earnings announcement premium. The observed earnings announcement premium would, thus, be entirely attributable to firms in categories B and C.

We assume that price relevant information, ϵ, is unconditionally distributed as $N(0, \sigma^2)$. A firm observes ϵ with probability $\lambda > 0$ which, without loss of generality, is independent of ϵ. Under the pre-Disclosure Regulation enforcement regime, the asymmetric reporting of material information is represented by the following graph:



In the above graph, the x-axis represents ϵ and the y-axis represents the probability density. The shaded portion of the graph represents the category B firms, that is firms that have material information but do not report it until the earnings announcement. The interval (0, τ) represents the range of ϵ where no 8-Ks were filed prior to 2004. The unshaded portions of the graph represent the category A firms. Note that with probability $1 - \lambda$ the firm is of type C, which is not represented in the graph.

The materiality threshold τ indicates information events that are significant and, hence, necessitate disclosure. Given the pre-2004 propensity to only disclose negative information, τ represent the threshold for only positive information. As a result, negative news ($\epsilon < 0$) and very positive news ($\epsilon > \tau$) trigger disclosure and the firm is of type A. Firms without any information (with probability $1-\lambda$) do not disclose and constitute type C. Type B firms have positive information that does not cross the materiality threshold τ and therefore do not report.

To formalize the model, we assume that the stock has a terminal value P_T at some terminal time T. We can think of T as the earnings announcement date when the true intrinsic value of the stock is revealed. When no price relevant material information exists, then $P_T = \mu$. To capture the effects of uncertainty on stock returns, we assume that a risk averse representative agent exists. We can then derive the stock price as the certainty equivalent of its payoff. Without loss of generality, we assume that the stock price P_t at $t \in [0, T)$ is:

$$P_t = E_t[P_T] - \kappa(var_t(P_T)),$$

where $E_t(.)$ denotes expectations relative to information at t, and the function $\kappa(.)$ is strictly increasing in $var_t(P_T)$ with $\kappa(0) = 0$.

We first address the consequences of not filing 8-Ks for information uncertainty and the earnings announcement premium. To convey the intuition behind these consequences, we first consider type A firms. We then discuss the implications of adding firms of type B and C. It is clear that for firms of type A, there is no information uncertainty. The firm and the investors observe $\epsilon = \epsilon_0$ and the price at time T^-, which represents the time just prior to the earnings announcement T, is:

$$P_{T^-} = E_{T^-}[P_T] - \kappa(var_{T^-}(P_T)) = \mu + E[\epsilon|\epsilon = \epsilon_0] = \mu + \epsilon_0.$$

For the firms that do not disclosure their signal, either because they did not receive one (Type C) or because the signal did not cross the materiality threshold (type B), the price at T^- is:

$$E_{T^-}[P_T] = \mu + \lambda E[\epsilon|0 < \epsilon < \tau] + (1-\lambda)E[\epsilon] = \mu + \lambda\sigma\frac{\phi(0) - \phi(\frac{\tau}{\sigma})}{\Phi(\frac{\tau}{\sigma}) - 1/2},$$

and

$$var_{T^-}(P_T) = \lambda(1-\lambda)\Big(var[\epsilon|0 < \epsilon < \tau] + var[\epsilon]\Big) = \lambda(1-\lambda)\sigma^2\Big[2 - \frac{\frac{\tau}{\sigma}\phi(\frac{\tau}{\sigma})}{\Phi(\frac{\tau}{\sigma}) - 1/2} - \Big(\frac{\phi(0) - \phi(\frac{\tau}{\sigma})}{\Phi(\frac{\tau}{\sigma}) - 1/2}\Big)^2\Big].$$

These closed form solutions arise from employing a truncated normal distribution to the material news that was not revealed pre-2004. The key insight (from the graph and the above expression) is that $var_{T^-}(P_T)$ is strictly increasing in τ.

We can approximate the instantaneous continuous return at time T for stocks of type B by:

$$log(P_T) - log(E_{T^-}[P_T]) \approx \kappa(var_{T^-}(P_T)).$$

Given that $var_{T^-}(P_T)$ is increasing in τ, the announcement premium is increasing in τ as well. If we consider the regime change with the 2004 Disclosure Regulation as a reduction of τ so that $\tau \approx 0$, then the premium disappears.

Just like the investors, we cannot empirically differentiate between a type B and type C firm. Therefore, we predict that pre-2004, we will see a premium for nonfilers (depicting the weighted average of categories B and C) and no premium for the filers. Based on the prior discussion, we characterize the Disclosure Regulation as forcing firms in category B to become filers. In other words, post-2004 category B firms do not exist anymore. Following earlier arguments, we only have firms that belong to categories A and C, and thus, we expect neither the filers (A) nor the nonfilers (C) to show a premium after 2004. Figure 1 depicts the above testable predictions. In summary, we predict that the earnings announcement premium will only manifest for the nonfilers in the pre-2004 period. Both filers and nonfilers in the post-2004 period will not show any EAP.

The above model does not explicitly account for the possibility of limited attention driving the announcement premium (Frazzini and Lamont, 2007; Chapman, 2018). A key distinction between information uncertainty and limited attention is warranted here. Significant information events, such as a catastrophic incident or a major breakthrough, likely garner media mentions and become attention grabbing events. If we allow media attention to depend upon the nature of information, it will be impossible to distinguish between information driven actions of investors and attention driven actions. For this reason, we elect to define limited attention more narrowly as a purely behavioral trait to correspond to investor reactions that are not driven by information.

If the elevated investor attention is only during earnings announcements (as posited by the limited attention theory), increased 8-K filings, as a consequence of the 2004 Disclosure Regulation, not should not alter the earnings premium. However, it is possible that the act of an 8-K filing can increase investor attention and, if such an increase were assumed independent of the information contained in the 8-Ks, it could still affect the EAP. Specifically, intermittent 8-K filings can cause investors to pay attention to firms earlier, resulting in an attenuation of the announcement premium.

Figure 1 outlines the predictions of this limited attention theory and contrasts them to those of the information uncertainty theory. Under both theories, filers, as discussed above, will have no earnings announcement premium, both before (A firms) and after (A and B firms) the regulation. However, the two theories have differing predictions for the nonfilers. Before the regulation change, both theories predict a premium for nonfilers with information (B firms). Under the limited attention view, these firms did not have any intermittent filings that would have distracted investors. The earnings announcement is the only attention event and therefore results in buying pressure and a premium.

Nonfilers without information (C firms) do not draw the attention of investors intermittently either and only garner attention during earnings announcements. Therefore, these firms should command a premium when investors suffer from limited attention. The change in regulation does not alter this relationship, and these firms ought to exhibit the premium post regulation. In contrast, the resolution of information uncertainty predicts that these firms (type C) command a premium before but not after the disclosure regulation.

3 Empirical Results

In this section, we first outline our data sources and summary statistics. We then provide evidence of the disappearing earnings announcement premium. Finally, we investigate the changing nature of 8-K filings as a potential reason behind the disappearance of the premium.

3.1 Data Sources and Summary Statistics

The primary data source that we use in our analysis is the Center for Research in Security Prices (CRSP) daily file with common shares outstanding from 1994-2016. We augment this dataset with additional firm financial information from Compustat and the Securities and Exchange Commission's filings database (EDGAR). The Compustat sample matches the CRSP sample, but EDGAR coverage begins in 1994. We use the metadata of the EDGAR database to create a set of all filings for all available firms. For earnings analysis, we use

Compustat quarterly data to determine the announcement dates for earnings (RDQ). To determine information surprises in earnings announcements, we use IBES data for analyst forecasts from 1980 to 2016.

Appendix A outlines the various reasons 8-Ks are issued, and Appendix B lists our variable definitions. Table 1 provides the summary statistics for our study, which spans the period 1994-2016. In Panel A, we list variables calculated either at year end or spanning the year-long period. The $YearlyFiler$ variable is a dummy variable that equals one if the firm made at least one 8-K filing over the course of the year. Approximately 82% of firms are 8-K filers in a given year, and the average firm makes about 7.75 8-K filings per year ($Yearly8Ks$). The average firm has Total Assets of about \$150 million, which equates to $LogAssets$ equal to 5.943. Furthermore, the average firm has a Tobin's Q of about 2, cash as a fraction of firm assets of 12%, and year over year sales growth of 10.7%.

We calculate the volatility and skewness of returns over each calendar year for all firms in the sample. The average (median) daily volatility is 3.7% (3.1%) and the average (median) skewness is 0.465 (0.351). We also aggregate the daily volume to calculate the total annual trading volume of each firm. We then divide the total volume over the number of shares outstanding at the beginning of the year to obtain a turnover measure for each firm-year observation. The average (median) firm in the sample experiences an 18.71 (11.25) turnover of shares outstanding each year.

In Panel B, we provide summary statistics of the variables we compute at the quarterly level. The analysis features an average of 4,197 firms with 7,144 8-K filings in each quarter. At the firm-level, each sample firm has an average of 1.943 8-K filings per quarter, indicated by $QuarterlyFirm8K$, which is consistent with the firm filing approximately 7.75 8-K filings per year, as shown in Panel A. The average for $Filer$ is 0.663, which indicates that nearly two-third of the firm-quarters have at least one 8-K filing (33.7% of the firm-quarters featured zero 8-K filings).

We calculate three versions of earnings surprises following Livnat and Mendenhall (2006). The first two versions of standardized unexpected earnings ($SUE1$ and $SUE2$) are based on

a random walk model of earnings. Specifically,

$$SUE = \frac{EPS_q - EPS_{q-4}}{P_q}$$

where EPS are quarterly earnings per share before extraordinary items (after excluding special items) for $SUE1$ (for $SUE2$), and P is the stock price. The last version uses IBES analyst median forecasts as a proxy for analyst consensus, so that

$$SUE = \frac{EPS_q - Consensus_{q-1}}{P_q}.$$

The average value of all three measures is between 11 bps and 17 bps. However, the standard deviation of $SUE3$ is significantly lower at 1.35%, whereas $SUE1$ and $SUE2$ have standard deviations of 5.41% and 4.21% respectively.

Finally, in Panel C, we summarize daily excess returns. The average daily return over our sample is 8.3 bps. The distribution of returns is highly skewed as the median return in our sample is 0.

3.2 The Disappearance of the Earnings Announcement Premium

For comparability to earlier work (e.g. Savor and Wilson (2016)), we form portfolios at the weekly frequency. Specifically, we form a portfolio of firms that had earnings announcements and a portfolio of those that did not for each week in our sample. We conduct the analysis for the period 1994 to 2016, resulting in a sample of over 1,100 weeks for both the announcers and non-announcers portfolios. For our primary analysis, we exclude the year 2004, since one potential reason for the disappearance of the earnings announcement premium pertains to an increase in disclosure regulation effective as of August 23, 2004, as discussed in Lerman and Livnat (2010).

We examine these portfolios over time and present the results in Table 2. The first two columns present portfolio excess returns, whereas the second and third sets of columns provide portfolio alphas from Fama-French three factor (FF-adjusted) and Carhart four-factor

(FFC-adjusted) regressions. In each set, the portfolios of announcers and nonannouncers are constructed by equal weighting all the stocks in the portfolio (equal weight) and then again by value-weighting all stocks in the portfolio (value-weight).

Panel A provides the returns for the full sample. The equal-weight (value-weight) index adjusted excess returns are 21.8 bps (14.7 bps) for non-announcers and 42.3 bps (35.1 bps) for announcers, which translate into a premium of 20.5 bps (20.4 bps) for announcers relative to non-announcers. The premium numbers in Columns 2 and 3 are nearly identical to the ones reported in Column 1. Next, we separate our sample into pre- and post-2004 regulation subsamples and present our results in Table 2 Panels B and C. In untabulated results, we find that our results are robust to examining a three-day window, a five-day window, and the exclusion of the financial crisis period from the sample.

Our pre-regulation sample shown in Panel B shows the existence of the earnings announcement premium that has been well-documented in previous literature (Beaver, 1968; Chari et al., 1988; Ball and Kothari, 1991; Cohen et al., 2007; Frazzini and Lamont, 2007; Barber et al., 2013; Savor and Wilson, 2016; Hou et al., 2017). The equal-weight (value-weight) excess returns in column one are 24.9 bps (14.1 bps) for non-announcers and 68.3 bps (46.6 bps) for announcers. This translates into a premium of 43.4 bps (32.6 bps) for announcers relative to non-announcers. Again, the numbers in Columns 2 and 3 are nearly identical to the numbers reported in Column 1, suggesting that commonly employed risk adjustments do not play a significant role in the earnings announcement premium.

In contrast, our post-regulation sample, which is presented in panel C shows no evidence of the earnings announcement premium. The equal-weight (value-weight) excess returns are 17.8 bps (14.7 bps) for non-announcers and 18.1 bps (23.4 bps) for announcers, which translates into a premium of 0.3 bps (8.7 bps) for announcers relative to non-announcers. These earnings announcement premium numbers are not statistically different from zero and are mirrored in Columns 2 and 3. The post-regulation results from Panel C present strong evidence that the earnings announcement premium has completely vanished after 2004.

In Table 3, we report cross-sectional weekly returns instead of portfolio returns. Within these tests, we treat each firm-week as a separate observation, as opposed to forming the

weekly portfolios as in Table 2. We then perform a firm fixed effect regression of weekly returns on an announcement indicator that is one if the firm announced earnings on that week (*Announce*), and an indicator for the post 2004 period (*Post 2004*), as well as the interaction between the two variables. The changing earnings announcement premium is captured as the coefficient on the interaction variable (*Announce* × *Post*2004). Panel A indicates that for the full sample, The excess (FF adjusted) weekly returns are 35.7 bps (27.3 bps) lower for announcements post 2004 relative to the previous period, which leads to earnings announcement premiums of 27.0-35.7 = -8.7 bps (-18 bps). If we examine a three-day (five-day) window, the FF adjusted returns are 29.3 bps (40.6 bps) lower for announcements post 2003 relative to the pre period, corresponding to earnings announcement premiums of -2.3 bps (-7.7 bps).

Table 3 columns 3 and 4 report coefficient estimates for absolute returns instead of signed returns. The coefficient on *Announce* is significantly positive, indicating that pre 2004, earnings announcements conveyed greater information to the market. The *Post 2004* coefficient is significantly negative, suggesting a decrease in volatility in nonannouncement periods after 2004. The coefficient on the interaction term is also significantly positive (0.910 in column 4), which shows that earnings announcement periods have become more informative relative to non-earnings announcement periods post 2004. This result is consistent with the findings in Beaver et al. (2018), who document a significant post 2001 increase in Beaver's U-Statistic, which is the ratio of volatilities in announcement to nonannouncement periods.

3.3 The International Earnings Announcement Premium

In Section 3.2, we documented that the earnings announcement premium in the United States has vanished after 2004. In order to better understand the cause of this disappearance, we examine whether this anomaly has vanished internationally after 2004. If the earnings announcement premium persists internationally, we can preclude worldwide stock market trends as potential explanations. These trends include market structure changes, new trading technologies, and more importantly the rise of algorithmic and high frequency trading.

Barber et al. (2013) document that of the twenty countries with enough observations to analyze, the earnings announcement premium is positive in nine: England, France, Germany, Switzerland, New Zealand, Singapore, Australia, South Africa, and Japan. To the best of our knowledge, there were no major shifts in disclosure requirements for material events within these countries.

For example, Companies House is the UK equivalent of the SEC's EDGAR filing mechanism. As of March 2018, UK firms still have between 14 days and a month to file with Companies House, depending on the nature of the material information.[8] Such a requirement is similar to the pre-2004 US filing environment and given the less stringent timeliness requirement, UK firms can include such material information with their 10-K / 10-Q equivalent filings.

We use Datastream's Worldscope database to obtain daily returns and earnings announcement dates for companies in all nine countries. We also use Compustat's global database as a second source of daily returns. To ensure data quality of the returns, we keep only those daily observations available in both databases and where the calculated returns are less than 2 bps apart. We aggregate the daily stock observations to obtain weekly return data and consider a calendar week to be an earnings announcement week if it contains the day of the earnings announcement. Additionally, for each country, we calculate an equally-weighted average of all stock returns as the market return and use the difference between the realized stock return and this market return as the market-adjusted return for each stock.

We present our cross-sectional weekly results in Table 4 for all nine countries. Aside from New Zealand, the coefficient on *Announce* $\times$ *Post 2004* is negative, though not statistically different from zero, for all nine countries, and the premium is economically large and persistent post 2004 for all nine countries. For example, the United Kingdom has returns (market-adjusted) that are 104 bps (114 bps) higher on announcement dates pre 2004. Post 2004, the earnings announcement premium attenuates slightly to 79 bps (88 bps market-adjusted).

Using market-adjusted absolute returns as measure of volatility, in Panel B earnings an-

[8] https://companieshouse.blog.gov.uk/2018/03/20/dont-be-late-for-those-very-important-dates/

nouncements are associated with higher volatility in all nine countries. Moreover, the interaction term is not significant when absolute returns are examined for five of the nine countries. These coefficients indicate that little changed in terms of the information environment around earnings announcements for these countries. The earnings announcement volatility appears to decrease in Germany, Singapore, and Japan, while it increases in New Zealand.

Advances in trading technologies and the rise of algorithmic trading have undoubtedly affected the US and European markets alike. The results reported in Table 4 indicate that the earnings announcement premium is still prominent in the nine countries featured in Barber et al. (2013). It is therefore unlikely that the disappearance of the premium in the United States is driven by global phenomena such as new technologies. Instead, this disappearance appears localized and specific to US markets.

3.4 Disclosure Regulation and the Earnings Announcement Premium

In Table 5, we examine the returns and absolute returns associated with 8-K filings in more detail. As previously discussed in Section 2, the new 8-K regulation was designed to make firms file 8-K forms in a more timely and comprehensive manner. In Table 5, we find that 8-K excess (FF-adjusted) returns are 31.9 bps (19 bps) higher post-2004. Additionally, 8-K filings were associated with higher absolute returns. Together, these findings support the notion that firms were asymmetrically reporting negative news before 2004. The regulation change was designed to reduce this asymmetry and mandate the timely reporting of good news, which is why post-2004, 8-K returns go up.

Next, we examine the relationship between the information content within 8-K filings and their effect on the earnings announcement premium. In Table 6, we directly examine the market effects and information content of firms' 8-K filings. We hypothesize that if a firm releases more information prior to its earnings announcements, the earnings announcements should be less informative. More specifically, if the firm releases more, timely news through

8-K filings, the earnings announcement premium should be smaller, regardless of whether the pre- or post-regulation time period is examined.

To test this theory, for each quarter, we aggregate the magnitude of the firm's FF-adjusted returns associated with all 8-K filings. We use these returns as a proxy for the amount of information contained within firm 8-K filings. Specifically, we first calculate the excess and FF-adjusted returns of each of the firm's 8-K filing weeks and take the algebraic sum over the quarter. This variable is indicative of the total amount of information a firm released about itself over the course of a given quarter. In Table 6 Panel A, we examine the earnings announcement premium, defined as the FF-adjusted weekly returns in the earnings announcement week, as a function of a firm's quarterly aggregate 8-K returns (8-K $returns$), a post 2004 dummy ($Post2004$), and an interaction term (8-K $returns \times Post2004$).

The earnings announcement returns are lower (-78.7 bps) after 2004, consistent with the disappearance of the earnings announcement premium. The coefficient on the 8-K returns variable is negative, indicating that there is a substitution between 8-K returns and earnings announcement returns. Combined with the results in Table 5 that show an average 8-K return increase of 32 bps after 2004, these results suggest that the earnings announcement premium is now preempted by an 8-K announcement premium. Consistent with our hypothesis, this relationship is unchanged post-2004, as indicated by the insignificant coefficient on 8-K $returns \times Post2004$. Regardless of the information contained within the 8-K filings, the more information revealed before the earnings announcement, the lower the earnings announcement premium.

We note that these numbers presented in Panel A likely understate the post-2004 importance of 8-K filings, since they represent the algebraic sum of the returns from all the 8-K filings in one quarter. It is possible that while one 8-K filing contained good news for the market leading to positive returns, another in the same quarter contained bad news leading to negative returns. In Panel B, we directly compare the absolute earnings announcement returns to the the sum of the absolute 8-K returns over the quarter. The 8-K absolute returns show an increased impact of 4.87% (4.142%) in market adjusted excess (FF-adjusted) returns. Consistent with Panel A, the corresponding interaction term 8-K $absolutereturns \times Post2004$

is not statistically significant.

Next, we compare the earnings announcement premium of filers and nonfilers. If filers are preempting the information contained in the earnings with 8-K filings, we would expect firms that are filers to have a lower earnings announcement premium and higher absolute earnings announcement premium. In Table 7, we show that filing firms are associated with earnings announcement premiums that are 13 bps (15 bps FF-adjusted) less than nonfilers. Furthermore, the absolute earnings announcement returns are 33 bps (27 bps FF-adjusted) higher for filers. The interaction term $Filer \times Post2004$ is positive and statistically significant at 27 bps (36 bps FF-adjusted). The interaction coefficient estimate indicates that the drop in the earnings announcement premium was more pronounced for nonfilers. This result is consistent with the model prediction that increased preemption by 8-Ks post 2004 resulted in only type C firms remaining nonfilers after the regulation change.

Prior research has distinguished between earnings related and non-earnings related 8-K filings (Noh et al., 2018). We predict that all material information, and not only earnings-related information, should have a price impact $ex-ante$. In untabulated empirical tests, we confirm that both kinds of filings mitigate the earnings announcement premium.

Beaver et al. (2018) find an increase in earnings informativeness post 2001. Our argument of a preemption of information in the earnings announcements by 8-Ks may, at first, appear contradictory to their findings. They use a *relative* measure, Beaver's U-Statistic, which focuses on the differences between earnings announcement and nonannouncement periods. This measure does not capture the *absolute* informativeness of earnings. In fact, absolute informativeness does not appear to have increased post 2004. For example, in Table 3 column 4, the difference between the absolute informativeness before and after 2004 is the sum of -1.169 and 0.910, which is still negative.

3.5 Filing Frequency as a Firm Characteristic

A key prediction from our model is that only firms of type B and C command an uncertainty premium. Given the lack of information about these firms in the pre-regulation regime,

earnings announcements resolve uncertainty, resulting in a premium. Thus, B and C firms serve as the treatment firms of the disclosure regulation. In this section, we further assume that during the short window surrounding the Disclosure Regulation, firm types remained relatively constant. The purpose of this assumption is to categorize the firms in our sample into the three types in the model. Specifically, under this assumption, we can distinguish B and C-type firms by considering their filing status before and after the regulation. Firms of type B change from not filing 8-Ks before the deregulation to filing 8-Ks afterwards, whereas type C firms do not file 8-Ks either before or after the regulation.

We use the three years before and after the regulation to define our sample and classify firms with above median frequency of 8-K filings as filers in both the before and after sub-samples. For each firm, we define two indicator variables that take the value 1 if the firm had above-median 8-K filings before ($FrequentBefore$) and after ($FrequentAfter$) 2004, respectively. Table 8 presents the results of regressions of firm-level earnings announcement (excess and FF-adjusted) returns on these variables as well their interaction. Focusing on the specification using FF-adjusted returns, the positive intercept of 26.9 bps corresponds to the earnings announcement returns of a firm with infrequent filings both before and after 2004, which loosely proxies for type C firms in our model. Firms with infrequent filings before but frequent filings after (type B firms) had a comparatively lower premium of about 22.3 bps ($26.9 - 4.6$) with no statistical difference, whereas firms that were frequent filers before 2004 had no premium at -3.5 bps ($26.9 - 30.4$).

Table 8 also presents the parameter estimates of regressions that include a $Post2004$ indicator variable as well as interactions with the filing frequency-based indicator variables. To the extent that the infrequent filers before 2004 represent the type B and C firms in our model, both firm types experience earnings announcement premiums in the pre-deregulation period of 46.8 ($56.2 - 9.4$) and 56.2 bps, respectively. The coefficient on the $FrequentBefore$ variable is significantly negative (-75.4 bps) and the interaction term ($FrequentBefore \times FrequentAfter$) has a positive and insignificant coefficient (35.4 bps). These two coefficients indicate that the frequent filers (our proxy for type A firms) had either slightly negative or slightly positive earnings announcement returns before the regulation. The coefficient on

*Post*2004 is significantly negative at -62 bps, indicating that former infrequent filers have lower earnings announcement abnormal returns.

The results from this analysis are consistent with the model predictions. Namely, infrequent filers are more likely to represent the type B and C firms in our model, and both types realize a premium during the pre-regulation window. However, the frequent filers, which correspond closely to the type A firms, did not realize a premium during that period. After the deregulation, both frequent and infrequent filers revert to earnings announcement abnormal return close to 0.

Since B firms had material information for stock markets and C firms did not, their fundamental characteristics are likely to be different. More importantly, these characteristics are likely to undergo different changes post 2004 relative to pre 2004. We examine four different characteristicsâ size (total assets), Tobinâs Q, Leverage, and ROE. B firms were much smaller than C firms pre 2004 but appear to grow much faster between the periods. Similarly, Tobinâs Q and ROE change drastically for B firms but remain almost unchanged for the C firms. While leverage for the B firms almost doubles, it actually falls for the C firms. These results suggest that B and C firms are fundamentally different, yet our theory predicts that both these diverse sets of firms will experience a similar decline in the earnings announcement premium. The EAP for C (B) firms falls from 62 (47) bps pre 2004 to -6 (1) bps post 2004. In additional untabulated tests, we find that these two types of firms differ significantly in their fundamental characteristics, yet as hypothesized, behave in a remarkably similar fashion with respect to the EAP.

3.6 Tests for Limited Attention

The model presented in Section 2.3 suggests that an increase in market attention could be one possible explanation for the attenuation of the earnings announcement premium. In this section, we test if there is an increase in firm attention post 2004, which could have led to the disappearance of the earnings announcement premium.

We utilize two proxies of attention from DeHaan et al. (2015).[9] Our first proxy for market attention is based on the number of 8-K downloads from EDGAR. Following DeHaan et al. (2015), we measure EDGAR activity on earnings announcement days relative to activity on other days by employing the following formula:

$$EDGAR = log(EDGAR_t) - log(\frac{1}{14}(\sum_{s=1w}^{7w} EDGAR_{t+s} + \sum_{s=-7w}^{-1w} EDGAR_{t+s})) \quad (1)$$

The first term is the sum of EDGAR 8-K downloads for the two days around the earnings announcement, while the second term is the average EDGAR 8-K downloads for the same two weekdays over the preceding seven weeks. We examine the relationship between attention and the earnings announcement premium in Table 9 Panel A. Since EDGAR data is not available before 2003 or after 2015, we perform our analysis for three windows: 2003-2005, 2003-2009, and 2003-2015, which all exclude 2004. The coefficient on $EDGAR$ is negative for all windows examined, indicating a negative relationship between attention and the earnings announcement premium. The coefficient on $EDGAR \times Post2004$ is negative for all samples, though it is only statistically significant when excess returns are utilized from 2003-2009.

Our second proxy for attention, *AnalystSpeed*, is the speed at which equity analysts impound earnings news into their future forecasts, which assumes that when analysts are distracted, it takes them longer to update their future forecasts. We collect data on the analyst forecasts, j, that are updated within 30 days of the firm's earnings announcement and then calculate the number of weekdays between the earnings announcement and the forecast update, as expressed in the following equation:

$$AnalystSpeed = -1 \times log(\frac{1}{j}\sum_{j=1}^{j}[1 + Weekdaysuntilforecastupdate_j]) \quad (2)$$

Higher values of *AnalystSpeed* indicate faster analyst updating. In Table 9 Panel B, we regress the earnings announcement premium on our measure of analyst speed, a post 2004

[9]While DeHaan et al. (2015) feature four attention proxies, we are unable to implement two due to data limitations. Google search volume is not available pre-2004, and we do not have access to the Ravenpack database.

dummy variable, and the interaction between the two for three sample periods: 2001-2007, 1999-2009, and 1995-2016. For all time periods examined, the coefficients on $AnalystSpeed$ and $AnalystSpeed \times Post2004$ are not statistically significant, indicating that there is no relationship between this measure of attention and the earnings announcement premium either pre or post 2004.

Taken together, these results suggest that there has not been a material change in the relationship between attention and the earnings announcement premium post 2004. Therefore, limited attention and more specifically a change in attention are unlikely to explain the disappearance of the premium. The hypotheses outlined in Section 2.3 suggest a positive relationship between investor attention and the earnings announcement premium. This relationship appears to be negative empirically, which also casts doubt on the limited attention hypothesis.

4 Systematic Vs. Idiosyncratic Information

The presence of an earnings announcement premium and its eventual disappearance in the US provide a laboratory for revisiting the causes of the premium in the first place. Our evidence regarding the informational content of 8-K filings being related to this disappearance indicates that informational hypotheses are likely the true causes of the premium. Two of the most prominent informational hypotheses for the premium's presence posit that the premium is due to: i) the release of market-wide information along with earnings announcements (Savor and Wilson, 2016; Patton and Verardo, 2012), or ii) an aversion to the earnings announcement-related idiosyncratic volatility by investors (Barber et al., 2013).

Both hypotheses are consistent with the disappearance of the premium if the information traditionally contained in earnings announcements is now pre-empted by the release of periodic 8-K filings. Market-wide information can be gleaned from such filings under the first hypothesis, and idiosyncratic volatility will no longer rise in anticipation of new information around earnings announcements under the second hypothesis. Both hypotheses are therefore

testable by contrasting the changes in stock sensitivity to the market and its idiosyncratic volatility around earnings announcements both before and after the premium's disappearance.

In this section, we use the frameworks of Savor and Wilson (2016) and Patton and Verardo (2012) to test the change in aggregate cash flow predictability and market sensitivity, and the framework of Barber et al. (2013) to test the change in idiosyncratic volatility. Table 10 presents the results of this analysis.

In Panel A of Table 10, we replicate the analysis of Savor and Wilson (2016) by analyzing the relationship between portfolio returns related to earnings announcements and aggregate earnings growth. Specifically, each week, we construct a long-short portfolio with the long legs consisting of all announcers and the short leg consisting of non-announcers. We aggregate the returns of this portfolio at the quarterly level, and use these returns to predict the seasonally-adjusted aggregate earnings over the next two quarters. The predictive regression also uses the returns to the market portfolio as predictor. Consistent with Savor and Wilson (2016), we find a strong positive relationship between the announcement returns and aggregate earnings growth both one quarter and two quarters ahead. These results are consistent with the hypothesis that earnings announcements contain information about future aggregate cash flow. However, this relationship does not decline after 2004 making it an unlikely reason for the disappearance. In other words, if the disappearance of the premium were due to fundamental changes to the nature of the information contained in earnings announcements such that earnings no longer predict cash flows, we would expect the predictability relationship to diminish after 2004. In fact, the ability of the earnings announcers portfolio to predict future aggregate earnings increases nearly two fold (by 0.770 from 0.371) when the prediction regression uses two quarters ahead aggregate earnings.

In Panel B of Table 10, we calculate the betas from calendar-year regressions of weekly stock return data on market excess returns, an indicator for the earnings announcements weeks, and the interaction of the two explanatory variables. For each stock-year, we obtain estimates of the market sensitivity (beta) and the change in this sensitivity around the earnings announcement. The table represents the average of these estimates before and

after the regulation change. For the period between 2001 and 2007 (excluding 2004), the market sensitivity around earnings announcement decreases. This decrease, however, is not statistically significant. For longer periods (1999 through 2009 or 1995 through 20016), the change in sensitivity is positive. Given that the sensitivity to market conditions remained the same or increased after the regulation change, it is unlikely that a decrease in systematic information is the reason for the EAP's disappearance.

Panel C of Table 10 provides results using a modification of the Ang et al. (2006) measure. The measure is based on the idiosyncratic volatility for a given stock around earnings announcements. Specifically, we run annual regressions on the market for each stock using weekly returns. We use the residuals from this regression to calculate volatility. For this analysis, we are interested in are the magnitudes of the residuals during earnings announcement weeks, and we compare these estimates before and after the regulation change. For all the windows that we consider, this estimate of idiosyncratic volatility decreases after deregulation.

4.1 Earnings Surprises Before and After Disclosure Regulation

It is important to note that our analysis depicts the earnings announcement premium without conditioning on the earnings outcome. The distribution of earnings outcomes is very likely to affect the announcement returns. Next, we estimate whether the distribution of earnings surprises has changed post regulation. Such a change can potentially explain the disappearance of the earnings announcement premium. The results are presented in Table 11.

We consider four different measures of earnings surprises. Our first measure (*Earnings*) uses a naïve measure of zero as the earnings expectation. The second specification (*SUE1*) employs a rolling seasonal random walk model to form earnings expectations, and the third specification (*SUE2*) augments the second specification by explicitly excluding special items. The last specification (*SUE3*) uses the consensus of IBES analyst forecasts. Analyst-based earnings surprises (*SUE3*) are widely considered to be the most accurate, both in content and time (Brown et al., 1987).

In Table 11 Panel A, we present the average surprise before and after 2004 as well as the differences between the two sub-periods for all four metrics. Our naïve earnings measurement has a t-statistic of -12.02, suggesting that overall, US firms have had lower earnings in recent years, which is consistent with Irvine and Pontiff (2008). However, we find no statistical differences in earnings surprises between the pre and post 2004 periods for *SUE1*, *SUE2*, and *SUE3*. If anything, these differences are positive and hence cannot explain a decline in the earnings announcement premium.

In Table 11 Panel B, we use a regression framework to examine the difference between filers and nonfilers in relation to the regulation change. We focus on analyst-based surprises since we seek to infer implications for announcement returns. The coefficient on the *post 2004* indicator variable shows that earnings surprises have decreased post 2004. Our theory argues that pre-regulation, nonfilers either had no material events to report or failed to report good news events. Consistent with this theory, we find that pre 2004, time series-based earnings surprises ($SUE1$ and $SUE2$) for nonfilers were more positive as compared to filers.

Analyst forecasts are a better proxy for investor expectations, and therefore, analyst-based surprises ($SUE3$) are more relevant for analyzing earnings announcement returns. The coefficients for $SUE3$ ($Post2004$ and $Post2004 \times Filer$) are insignificant, indicating that analyst-based surprises did not change for both filers and nonfilers. This finding suggests that post 2004 there has been no change in analysts' ability to forecast earnings on average. Thus, any change in the earnings announcement premium post 2004 cannot be attributed to biased investor expectations. Given the invariance of the average analyst forecast accuracy, the change in the earnings announcement premium can only be attributed to a change in information uncertainty post 2004.

5 Conclusion

The Earnings Announcement Premium has been a long-enduring anomaly in the capital markets. Buying a stock just prior to its earnings announcement yields abnormal returns over

short windows unconditional on the earnings outcome. First documented for US companies in 1968, it has been subsequently documented in several studies in Accounting and Finance, such as Beaver (1968); Chari et al. (1988); Ball and Kothari (1991); Cohen et al. (2007); Frazzini and Lamont (2007); Barber et al. (2013); Savor and Wilson (2016); Chapman (2018), among others. It has also been shown to be robust internationally (Barber et al., 2013). While several previous anomalies have been shown to be artifacts of data mining, micro-caps or have lost robustness in recent times due to active trading (Harvey et al., 2016; Hou et al., 2017; Green et al., 2017; McLean and Pontiff, 2016), this anomaly has hitherto remained robust.

We document the first evidence that this trading strategy no longer produces abnormal returns. We then argue that a reason behind the disappearance of this anomaly lies in the increase in 8-K filings of material events by companies following the 2004 Disclosure Regulation. These filings appear to preempt the uncertainty-resolving information previously disclosed in earnings announcements. Our evidence thus supports information-related theories for the premium (Ball and Kothari, 1991; Savor and Wilson, 2016; Barber et al., 2013), rather than limited attention-based theories (Frazzini and Lamont, 2007; Chapman, 2018). In additional tests, we find support for both an idiosyncratic as well as market-wide information uncertainty theories.

Finally, our findings provide evidence regarding the market efficiency implications of disclosure regulation. By showing that additional mandated disclosure is associated with the attenuation of the earnings announcement premium, we highlight the regulators' role in reducing information uncertainty, and hence, consequently reducing the information risk for market participants.

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Figure 1. 8-Ks and the Earnings Announcement Premium
This figure presents the predictions for the earnings announcement premium under the different hypothesized theories. Panel A depicts the prediction of the information uncertainty theory, whereas Panel B depicts them under the limited attention theory. Both panels show the premium before and after a regulation change that alters the information environment in 2004. Regarding the information environment, there are three types of firms. Firms can either have information or not have information. Within the set of firms that can have information, they may choose to disclose it (Firm A) or not disclose it (Firm B). The remaining firms (Firm C) do not have material information.

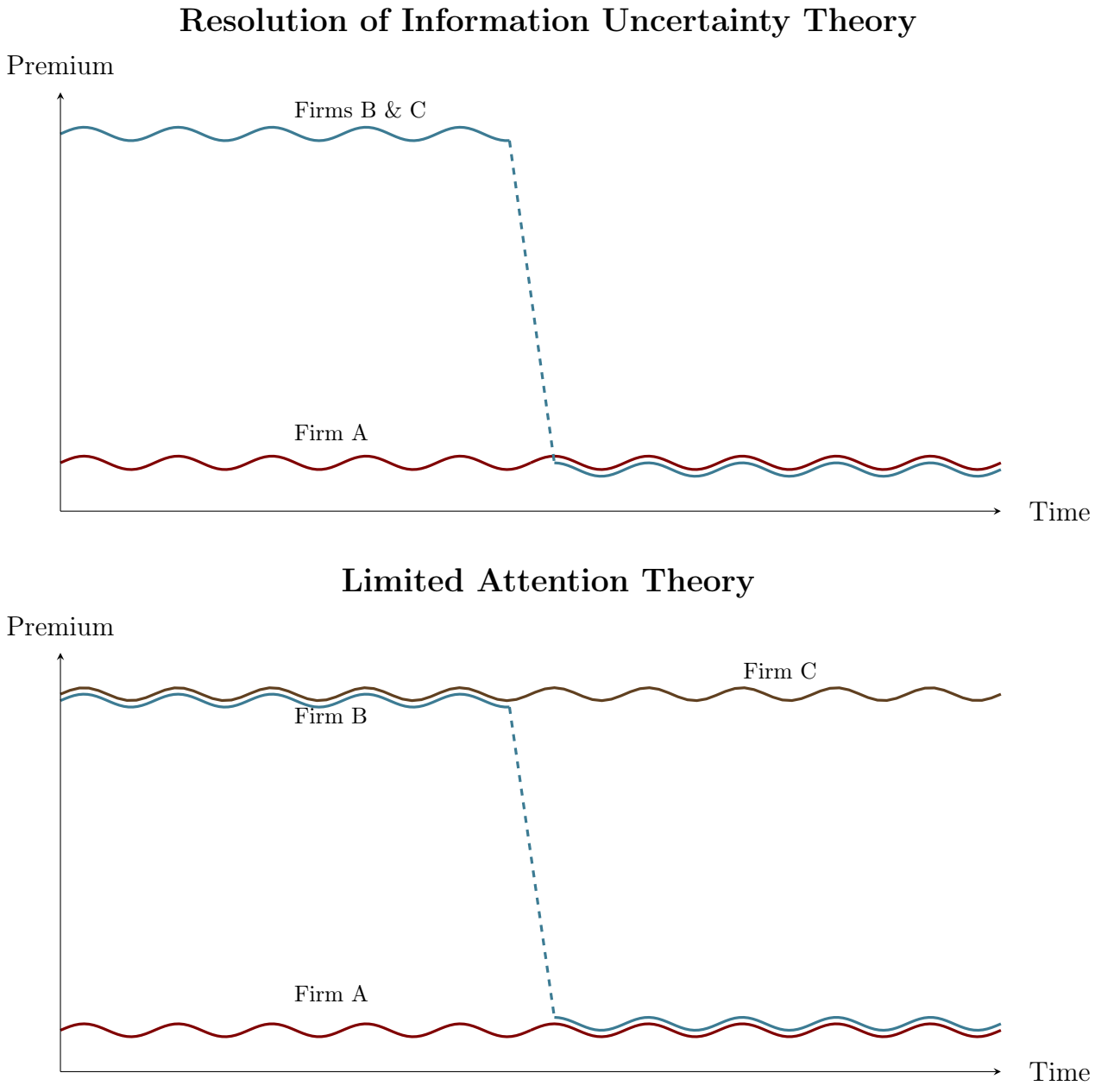


Table 1. Summary Statistics

Panel A indicates the yearly-level (Panel A), quarterly-level (Panel B), and daily-level (Panel C) variables used for analysis. Log firm assets ($LogAssets$) is the natural log of firm assets in millions of USD. $TobinsQ$ is calculated as total assets + market value of equity − the book value of equity scaled by total assets, while $Cash$ is firm cash scaled by total assets. $SalesGrowth$ represents the year-over-year sales growth scaled by firm assets. $YearlyFiler$ is an indicator variable that takes a value of 1 if a firm files an 8-K in a given year, while $Yearly8ks$ counts the number of 8-K filings that a firm makes over the course of a year. $LogYearly8Ks$ is the natural log of $Yearly8ks$. Within Panel B, all variables are calculated at the quarterly level. $FirmsinQuarter$ and $QuarterlyTotal8Ks$ count the total number of firms and 8-K filings analyzed in a given quarter. $QuarterlyFirm8k$ counts the number of 8-K files for a given firm-quarter, while $LogQuarterlyFirm8Ks$ is the log of $QuarterlyFirm8k$. $QuarterlyFiler$ is an indicator variable that takes the value of 1 if a firm made an 8-K filing in a given quarter. $SUE1$ and $SUE2$ represent earnings surprises relative to a random walk model of earnings and earnings after adjusting for special items, respectively. $SUE3$ is the surprise in earnings relative to analyst forecasts. All three earnings surprise variables are scaled by stock price and winsorized at the 1% and 99% levels. Panel C presents daily returns which are the delisting-adjusted stock returns. Further details about each variable as well as the data sources are contained in Appendix B.

	mean	SD	p25	p50	p75	N
Panel A: Yearly Variables						
LogAssets	5.943	2.190	4.360	5.922	7.403	80,726
TobinsQ	1.986	2.396	1.042	1.340	2.088	80,726
Cash	0.120	0.158	0.018	0.056	0.160	80,726
SalesGrowth	0.107	0.352	-0.007	0.036	0.172	80,726
YearlyFiler	0.816	0.387	1	1	1	80,726
Yearly8Ks	7.748	5.057	2.106	11.782	12.655	80,726
LogYearly8Ks	1.707	1.062	0.693	1.946	2.565	80,726
Panel B: Quarterly Variables						
FirmsinQuarter	4,197	866	3,455	4,018	5,045	320,649
QuarterlyTotal8Ks	7,144	4,106	2,681	8,501	10,764	320,649
QuarterlyFirm8K	1.943	2.275	0.000	1.000	3.000	320,649
LogQuarterlyFirm8Ks	0.829	0.703	0.000	0.693	1.386	320,649
QuarterlyFiler	0.663	0.473	0.000	1.000	1.000	320,649
QuarterlyRSQ	0.255	0.195	0.102	0.194	0.367	320,649
$SUE1$	-0.218	7.560	-0.505	0.139	0.571	296,542
$SUE2$	-0.145	5.050	-0.434	0.140	0.531	296,571
$SUE3$	-0.141	2.230	-0.104	0.033	0.197	314,812
Panel C: Daily Variables						
Returns	0.083	4.605	-1.493	0.000	1.426	25,895,082

Table 2. The Disappearance of the Earnings Announcement Premium
The table presents the weekly returns to portfolios of announcers and nonannouncers. Panels A, B, and C provide the weekly returns over three different sample periods: 1994-2016 (Panel A), 1994-2003 (Panel B), and 2005-2016 (Panel C). All samples exclude observations from 2004, the year of the disclosure regulation. For each sample week, we construct both equal-weighted and market-value weighted weekly portfolios that include firms that had earnings announcements in that week ($Announcers$) and firms that did not have earnings announcements ($Non - Announcers$). Subsequently, we test for the difference in returns between $Announcers$ and $Non-announcers$. The first set of columns (1 and 2) report the average excess return over the risk free rate for the portfolios. The second (3 and 4) and third (5 and 6) sets of columns report portfolio alphas with respect to the Fama-French three-factors and the Carhart four-factor models, respectively. Heteroscedasticity-consistent standard errors are utilized, and t-statistics are presented in parentheses.

	Excess Returns		FF-adjusted		FFC-adjusted	
	Equal Weight	Value Weight	Equal Weight	Value Weight	Equal Weight	Value Weight
Panel A. Full Sample (1994 - 2016)						
Non-announcer	0.218	0.147	0.045	-0.008	0.080	-0.007
	(2.92)	(2.09)	(2.02)	(-1.34)	(4.27)	(-1.07)
Announcer	0.423	0.351	0.246	0.200	0.282	0.208
	(4.91)	(3.73)	(5.34)	(3.26)	(6.30)	(3.38)
Difference	0.205	0.204	0.201	0.208	0.201	0.215
	(5.18)	(3.26)	(5.06)	(3.33)	(5.05)	(3.42)
Panel B. Pre-regulation sample (1994 - 2003)						
Non-announcer	0.249	0.140	0.078	-0.009	0.139	-0.005
	(2.51)	(1.35)	(2.07)	(-1.13)	(4.74)	(-0.61)
Announcer	0.683	0.466	0.512	0.313	0.579	0.305
	(5.92)	(3.20)	(7.81)	(3.44)	(9.54)	(3.33)
Difference	0.434	0.326	0.434	0.322	0.439	0.310
	(8.22)	(3.51)	(8.13)	(3.46)	(8.17)	(3.30)
Panel C. Post-regulation sample (2005 - 2016)						
Non-announcer	0.178	0.147	0.013	-0.010	0.026	-0.009
	(1.56)	(1.44)	(0.47)	(-1.01)	(1.07)	(-0.96)
Announcer	0.181	0.234	0.014	0.083	0.027	0.095
	(1.38)	(1.78)	(0.21)	(0.94)	(0.41)	(1.08)
Difference	0.003	0.087	0.001	0.093	0.001	0.104
	(0.05)	(0.97)	(0.02)	(1.04)	(0.01)	(1.17)

Table 3. The Cross-Sectional Earnings Premium

The table presents regression estimates of the earnings announcement premium (Columns 1-2) and the magnitude of earnings announcement returns (Columns 3-4) as calculated using weekly returns (Panels A and D), three-day returns (Panel B), and five-day returns (Panel C). The full sample includes all firms in CRSP with a valid earnings announcement date between 1994 and 2016, excluding 2004, while Panel D spans 2001-2007, excluding 2004. In columns 1 and 2, the dependent variable is the excess return and Fama-French adjusted return on a given stock. The general model estimated is:

$r_{it} = \alpha_i + \beta_1 Announce_{it} + \beta_2 Post2004_t + \beta_3 Announce_{it} \times Post2004_t + \epsilon_{it}$

In columns 3 and 4, the dependent variable is the absolute excess return and absolute Fama-French adjusted return on a given stock. The *Announce* variable is an indicator that takes a value of 1, if the firm makes an earnings announcement. The *Post 2004* is an indicator variable that takes a value of 1 if the observation date is after 2004; and *Announce* × *Post 2004* is the interaction between the two variables. Heteroscedasticity-consistent standard errors are utilized, and t-statistics are presented in parentheses. The firm fixed effect parameters α_i are not reported.

	Returns		Absolute Returns	
	Excess	FF-adjusted	Excess	FF-adjusted
Panel A: Weekly returns 1994-2016				
Announce	0.270	0.093	1.391	1.278
	(19.88)	(4.74)	(128.07)	(83.68)
Post 2004	-0.166	-0.002	-0.805	-1.169
	(-17.66)	(-0.13)	(-107.54)	(-111.06)
Announce x Post 2004	-0.357	-0.273	1.331	0.910
	(-13.92)	(-7.36)	(65.01)	(31.61)
Panel B: Three-day window (t-1, t+1) for full sample				
Announce	0.340	0.270	1.791	1.754
	(19.53)	(15.75)	(129.12)	(129.74)
Post 2004	-0.145	-0.137	-0.786	-1.101
	(-35.72)	(-33.79)	(-243.10)	(-344.24)
Announce x Post 2004	-0.390	-0.293	1.010	1.151
	(-15.44)	(-11.81)	(50.25)	(58.81)
Panel C: Five-day window (t-2, t+2) for full sample				
Announce	0.406	0.329	1.641	1.599
	(18.65)	(15.42)	(95.43)	(95.98)
Post 2004	-0.277	-0.218	-0.994	-1.360
	(-54.54)	(-43.04)	(-247.91)	(-344.96)
Announce x Post 2004	-0.520	-0.406	1.001	1.110
	(-16.47)	(-13.12)	(40.17)	(46.02)
Panel D: Weekly returns 2001-2007				
Announce	0.493	0.037	2.064	1.795
	(13.41)	(0.69)	(74.26)	(45.80)
Post 2004	-0.434	-0.044	-1.612	-2.352
	(-26.56)	(-1.86)	(-130.39)	(-134.96)
Announce x Post 2004	-0.688	-0.028	0.493	0.245
	(-12.72)	(-0.36)	(12.05)	(4.25)

Table 4. The International Earnings Announcement Premium
The table presents regression estimates of the weekly market-adjusted earnings announcement returns (Panel A) and the absolute market-adjusted earnings announcement returns (Panel B) for nine countries: England, France, Germany, Switzerland, New Zealand, Singapore, Australia, South Africa, and Japan. The sample includes all firms in Datastream and Compustat with a valid earnings announcement date between 1998 and 2016 excluding 2004. The general model for the market-adjusted returns estimated is:
$r_{it} = \alpha_i + \beta_1 Announce_{it} + \beta_2 Post2004_t + \beta_3 Announce_{it} \times Post2004_t + \epsilon_{it}$
In Panel B, the dependent variable is the weekly absolute market-adjusted return on a given stock. The *Announce* variable is an indicator that takes a value of 1, if the firm makes an earnings announcement. The *Post 2004* is an indicator variable that takes a value of 1 if the observation date is after 2004, and *Announce* × *Post 2004* is the interaction between the two variables. Heteroscedasticity-consistent standard errors are utilized, and t-statistics are presented in parentheses. The firm fixed effect parameters α_i are not reported.

	England	France	Germany	Swizerland	New Zealand	Singapore	Australia	South Africa	Japan
Panel A: Weekly Market-Adjusted Returns									
Announce	1.135	0.558	0.405	0.391	0.229	0.522	0.404	0.967	0.249
	(9.01)	(6.17)	(3.59)	(4.89)	(1.24)	(3.72)	(2.82)	(7.19)	(8.03)
Post 2004	-0.070	-0.001	-0.083	-0.007	-0.056	-0.112	-0.280	-0.103	-0.049
	(-2.01)	(-0.04)	(-2.38)	(-0.32)	(-1.02)	(-2.90)	(-6.94)	(-2.44)	(-6.13)
Announce x Post 2004	-0.258	-0.169	-0.162	-0.096	0.511	-0.126	-0.083	-0.076	-0.046
	(-1.85)	(-1.58)	(-1.23)	(-0.99)	(2.39)	(-0.82)	(-0.53)	(-0.46)	(-1.32)
Panel B: Weekly Absolute Market-Adjusted Returns									
Announce	2.511	0.943	0.947	1.056	0.934	0.850	0.995	1.306	0.259
	(23.61)	(11.86)	(9.72)	(17.50)	(6.24)	(7.19)	(8.39)	(11.59)	(10.95)
Post 2004	-0.581	-0.913	-1.166	-0.702	-0.209	-0.117	-0.351	-1.069	-0.948
	(-19.67)	(-37.90)	(-38.92)	(-40.78)	(-4.69)	(-3.58)	(-10.50)	(-30.37)	(-156.04)
Announce x Post 2004	0.062	-0.038	-0.539	0.048	0.443	-0.353	-0.042	-0.135	0.802
	(0.53)	(-0.40)	(-4.75)	(0.65)	(2.55)	(-2.74)	(-0.33)	(-0.98)	(30.29)

Table 5. 8-K Returns

This table presents the change after 2004 in quarterly returns (Columns 1 and 3) and absolute returns (Columns 2 and 4) realized over weeks with an 8-K filing. The dependent variable is excess returns in Columns 1-2 and returns adjusted for the three Fama-French factors in Columns 3-4. The variable *Post 2004* is an indicator variable that takes a value of 1 if the observation date is after 2004. All specifications include firm fixed effects. Heteroscedasticity-consistent standard errors are utilized, and t-statistics are presented in parentheses. The sample covers all stocks between 1994 and 2016 excluding 2004.

	Excess		FF-adjusted	
	Return	Absolute return	Return	Absolute return
Post 2004	0.319	11.351	0.190	15.375
	(5.38)	(174.98)	(2.88)	(161.16)

Table 6. Earnings Announcement Returns and 8-K Returns
The table presents the relationship between earnings announcement (absolute) returns and 8-K filing (absolute) returns. Earnings announcement returns and 8-K returns are calculated as excess returns (column 1) or Fama-French-adjusted returns (column 2). Panel A presents results where returns for both events are used, whereas Panel B uses absolute returns for earnings announcements and 8-K filings. The variable *Post 2004* is an indicator variable that takes a value of 1 if the observation date is after 2004. The 8-K (absolute) return is the sum of (absolute) returns on 8-K filing weeks over the fiscal quarter. All specifications include firm fixed effects. Heteroscedasticity-consistent standard errors are utilized, and t-statistics are presented in parentheses. The sample covers all stocks with an earnings announcement between 1994 and 2016 excluding 2004.

	Excess	FF-adjusted
Panel A. Earnings announcement returns		
Post 2004	-0.787	-0.436
	(-14.69)	(-6.23)
8-K returns	-0.010	-0.010
	(-3.00)	(-3.10)
8-K returns x Post 2004	0.005	0.002
	(1.39)	(0.54)
Panel B. Absolute earnings announcement returns		
Post 2004	-0.523	-1.379
	(-11.77)	(-24.15)
8-K absolute returns	0.049	0.041
	(23.10)	(21.77)
8-K absolute returns x Post 2004	0.001	0.000
	(0.40)	(-0.04)

Table 7. Earnings Announcement Returns and 8-K Filings
The table contrasts the earnings announcement (absolute) returns for 8-K filers and nonfilers. Earnings announcement returns are calculated as excess returns (columns 1 and 2) or Fama-French-adjusted returns (columns 3 and 4). The variable *Post 2004* is an indicator variable that takes a value of 1 if the observation date is after 2004. *Filer* is an indicator variable that takes a value of 1 if the firm files at least one 8-K in quarter t, and $Filer \times Post2004$ is the interaction between *Filer* and *Post 2004*. All specifications include firm fixed effects. Heteroscedasticity-consistent standard errors are utilized, and t-statistics are presented in parentheses. The sample covers all stocks with an earnings announcement between 1994 and 2016 excluding 2004.

	Excess		FF-adjusted	
	Return	Absolute return	Return	Absolute return
Intercept	0.688	7.158	0.122	9.973
	(20.60)	(267.55)	(2.68)	(279.28)
Post 2004	-0.755	-0.152	-0.519	-0.825
	(-6.16)	(-1.54)	(-3.24)	(-6.45)
Filer	-0.127	0.332	-0.149	0.272
	(-2.03)	(6.64)	(-1.76)	(4.09)
Filer x Post 2004	0.274	-0.166	0.363	-0.477
	(2.01)	(-1.51)	(2.03)	(-3.34)

Table 8. Earnings Announcement Returns and 8-K Filings
The table contrasts the earnings announcement returns of frequent 8-K filers to those of non-frequent filers. Earnings announcement returns are calculated as excess returns (columns 1 and 2) or Fama-French-adjusted returns (columns 3 and 4). The variable *Post 2004* is an indicator variable that takes a value of 1 if the observation date is after 2004. *Frequent Before* is an indicator variable that takes a value of 1 if the firm filed more 8-Ks than the median firm before 2004, and *Frequent After* is an indicator variable that takes a value of 1 if the firm filed more 8-Ks than the median firm after 2004. Interactions between these variables are indicated with the operator $\times$. Heteroscedasticity-consistent standard errors are utilized, and t-statistics are presented in parentheses. The sample covers all stocks with an earnings announcement between 2001 and 2007 excluding 2004.

	Ret - Rf		FF-Adjust. Ret	
Intercept	0.631	1.265	0.269	0.562
	(8.25)	(12.02)	(2.79)	(4.24)
Frequent Before	-0.107	-0.403	-0.304	-0.754
	(-0.90)	(-2.55)	(-2.05)	(-3.79)
Frequent After	-0.193	0.019	-0.046	-0.094
	(-1.52)	(0.11)	(-0.29)	(-0.41)
Frequent Before x Frequent After	0.029	-0.073	0.161	0.354
	(0.17)	(-0.31)	(0.77)	(1.22)
Post 2004		-1.338		-0.620
		(-8.75)		(-3.22)
Post 2004 x Frequent Before		0.530		0.994
		(2.22)		(3.32)
Post 2004 x Frequent After		-0.253		0.158
		(-0.99)		(0.49)
Post 2004 x Frequent Before x Frequent After		0.171		-0.511
		(0.51)		(-1.22)

Table 9. Earnings announcement returns and attention
This table presents regression estimates pertaining to the relationship between two measures of attention and the earnings announcement weeks for several time periods. The variable *EDGAR* measures EDGAR download activity on earnings announcement days relative to activity on other days by employing the following formula:
$EDGAR = log(\sum_{t=0}^{1} EDGAR_t) - log(\frac{1}{7}\sum_{w=1}^{7}\sum_{t=-7w}^{7w+1} EDGAR_t)$
The first term is the sum of EDGAR 8-K downloads for the two days around the earnings announcement, while the second term is the average EDGAR 8-K downloads for the same two weekdays over the preceding seven weeks. We collect data on the analyst forecasts that are updated within 30 days of the firm's earnings announcement and then calculate the number of weekdays between the earnings announcement and the forecast in the following equation where j is the number of analyst forecasts occurring within 30 days of earnings announcements:
$AnalystSpeed = -1 \times log(\frac{1}{j}\sum_{j=1}^{j}[1 + Weekdaysuntilforecastupdate_j])$
The *Post 2004* is an indicator variable that takes a value of 1 if the observation date is after 2004, while *EDGAR* × *Post 2004* and *Analyst Speed* × *Post 2004* represent interactions between the two variables. Heteroscedasticity-consistent standard errors are utilized, and t-statistics are presented in parentheses. The firm fixed effect parameters α_i are not reported.

	Ret - Rf	FF-Adj. Ret	Ret - Rf	FF-Adj. Ret	Ret - Rf	FF-Adj. Ret
Panel A: EDGAR attention						
	2003 - 2005		2003 - 2009		2003 - 2015	
EDGAR	-0.032	-0.035	-0.026	-0.033	-0.026	-0.032
	(-2.51)	(-2.16)	(-1.74)	(-1.71)	(-1.90)	(-1.86)
Post 2004	-0.915	0.415	-0.979	0.016	-1.242	-0.259
	(-8.95)	(3.24)	(-9.43)	(0.12)	(-13.42)	(-2.23)
EDGAR x Post 2004	0.009	-0.043	-0.059	-0.003	-0.024	0.007
	(0.44)	(-1.62)	(-3.29)	(-0.11)	(-1.57)	(0.37)
Panel B: Analyst updating speed						
	2001 - 2007		1999 - 2009		1995 - 2016	
Analyst Speed	-0.003	0.151	0.013	0.022	0.034	0.082
	(-0.03)	(1.55)	(0.20)	(0.26)	(0.78)	(1.50)
Post 2004	-0.550	-0.108	-0.417	-0.123	-0.671	-0.414
	(-3.23)	(-0.51)	(-2.68)	(-0.62)	(-6.25)	(-3.06)
Analyst Speed x Post 2004	0.089	-0.079	-0.067	-0.092	-0.028	-0.036
	(0.81)	(-0.57)	(-0.69)	(-0.75)	(-0.46)	(-0.47)

Table 10. Systematic and idiosyncratic resolution of uncertainty

This table presents parameter estimates for models of aggregate earnings predictability (Panel A), earnings announcement period market beta (Panel B), and idiosyncratic volatility around earnings (Panel C). In Panel A, presents parameter estimates from a predictability regression of total earnings using the earnings announcement long-short portfolio from section 4. The general model uses quarterly returns of the earnings announcers portfolio and the market portfolio to predict aggregate earnings before and after 2004. In the first set of columns, the prediction is for one quarter ahead (t), and in the second set of columns, the prediction is for two quarters ahead (t+1). In Panel B, weekly returns are used to estimate a market factor regression for each stock each year, using an indicator variable for earnings announcement weeks. The point estimates are winsorised at the 5% level and used to estimate the change in parameters before and after 2004. In Panel C, weekly returns are used to estimate a market factor regression for each stock each year and the volatility of residual estimates from this regression is used as a proxy for idiosyncratic volatility. The Panel reports the change in these volatility estimates during earnings announcement weeks before and after 2004.

Panel A. Aggregate Earnings Predictability

	Earnings Growth (t)			Earnings Growth (t+1)		
EAP Portfolio	**0.432**		**0.445**	**0.371**		**0.360**
	(2.88)		**(3.05)**	**(2.67)**		**(2.56)**
EAP x Post 2004	**0.306**		**-0.029**	**0.770**		**0.671**
	(1.36)		**(-0.13)**	**(3.69)**		**(3.00)**
Mkt - RF		-0.001	-0.003		0.004	0.003
		(-0.19)	(-0.62)		(0.83)	(0.56)
Mkt x Post 2004		0.051	0.042		0.035	0.011
		(4.82)	(3.80)		(3.21)	(0.99)
Post 2004	0.001	-0.001	0.000	0.000	-0.001	0.000
	(0.53)	(-1.57)	(-0.09)	(0.09)	(-1.16)	(-0.11)
Intercept	0.000	0.001	0.000	0.000	0.001	0.000
	(0.00)	(2.91)	(0.03)	(0.34)	(2.66)	(0.32)

Panel B. Market β around earnings announcements

	2001-2007	1999 - 2009	1996 - 2016
MKT - RF			
Intercept	0.823	0.714	0.705
	(145.02)	(164.37)	(215.63)
Post 2004	0.170	0.317	0.334
	(20.20)	(49.36)	(74.64)
Earnings Week			
Intercept	0.175	0.220	0.302
	(3.62)	(5.79)	(10.92)
Post 2004	-0.389	-0.299	-0.426
	(-6.26)	(-5.60)	(-11.61)
(MKT - RF) x Earnings Week			
Intercept	0.066	0.024	0.041
	(2.78)	(1.41)	(3.09)
Post 2004	-0.041	0.004	0.045
	(-1.04)	(0.15)	(2.24)

Panel C. Idiosyncratic volatility around earnings announcements

	2001-2007	1999 - 2009	1996 - 2016
Post 2004	-0.362	-0.104	-0.119
	(-18.44)	(-5.33)	(-8.68)

Table 11. Earnings Surprises
The table presents the change in earnings surprises after 2004. Panel A documents the change in the level of earnings surprises before and after 2004, whereas Panel B presents the change for filers and nonfilers. To define surprises in earnings, we use four alternate definitions of expected earnings. The first specification (*Earnings*) uses a naive measure of zero as earnings expectation, whereas the second specification (*SUE1*) uses a rolling seasonal random walk model. In addition to the rolling seasonal random walk model, the third specification (*SUE3*) also accounts for the exclusion of special items. The last specification (*SUE3*) uses the consensus of IBES analyst forecasts. Panel A presents the average surprise before and after 2004 as well as the difference between the two sub-periods. Panel B presents regression results where the dependent variable is the standardized earnings surprise. The variable *Post 2004* is an indicator variable that takes a value of 1 if the observation date is after 2004. The $Filer$ is an indicator variable that takes a value of 1, if the firm files at least one 8-K in quarter t, and $Filer \times Post2004$ is the interaction between the *Filer* and *Post 2004* variables. The regression uses firm fixed effects and the standard errors are adjusted for Heteroscedasticity. The sample covers all stocks with an earnings announcement between 1994 and 2016 excluding 2004.

	Earnings surprise (%)			
	Earnings	$SUE1$	$SUE2$	$SUE3$
Panel A. Earnings surprises before and after 2004				
Pre 2004	-0.002	-0.201	-0.145	-0.062
	(-96.65)	(-15.56)	(-14.75)	(-21.05)
Post 2004	-0.002	-0.158	-0.117	-0.062
	(-68.30)	(-9.81)	(-9.44)	(-14.29)
Difference	0.000	0.042	0.026	0.000
	(-12.02)	(1.84)	(1.50)	(0.06)
Panel B. Earnings surprises for 8-K filers				
Post 2004	-0.001	-0.390	-0.320	-0.055
	(-8.29)	(-2.90)	(-3.09)	(-1.87)
Filer	-0.001	-0.252	-0.157	-0.045
	(-20.89)	(-5.72)	(-4.64)	(-4.56)
Filer × Post 2004	0.001	0.411	0.334	0.017
	(7.58)	(2.95)	(3.12)	(0.56)

A 8-K File Descriptions

Table A1. This table shows the reportable events for Form 8-K as of the date of new regulation, August 23rd, 2004. The Section column provides a description of the broad category of 8-K disclosure. New Item Number corresponds to the item number post-regulation change, while the Old Item Number corresponds to the 8-K item number pre-regulation. A description of each 8-K item is included under the Description category, and the final column indicates whether the variable was a new item post-regulation. This Table contains information from Lerman and Livnat (2010) and McMullin et al. (2018).

Section	New Item Number	Old Item Number	Description	New Item
1. Registrant's Business and Operations	1.01	-	Entry into a Material Definitive Agreement	Yes
	1.02	-	Termination of a Material Definitive Agreement	Yes
	1.03	3	Bankruptcy or Receivership	No
2. Financial Information	2.01	2	Completion of Acquisition or Disposition of Assets	No
	2.02	12	Results of Operations and Financial Condition	No
	2.03	-	Creation of a Direct Financial Obligation or an Obligation under an Off-Balance Sheet Arrangement of a Registrant	Yes
	2.04	-	Triggering Events That Accelerate or Increase a Direct Financial Obligation or an Obligation under an Off-Balance Sheet Arrangement	Yes
	2.05	-	Costs Associated with Exit or Disposal Activities	Yes
	2.06	-	Material Impairments	Yes
3. Securities and Trading Markets	3.01	-	Notice of Delisting or Failure to Satisfy a Continued Listing Rule or Standard: Transfer of Listing	Yes
	3.02	-	Unregistered Sales of Equity Securities	Yes
	3.03	-	Material Modifications to Rights of Security Holders	Yes
4. Matters Related to Accountants and Financial Statements	4.01	4	Changes in Registrant's Certifying Accountant	No
	4.02	-	Non-Reliance on Previously Issued Financial Statements or a Related Audit Report or Completed Interim Review	Yes
5. Corporate Governance and Management	5.01	1	Changes in Control of Registrant	No
	5.02	6	Departure of Directors or Principal Officers; Election of Directors; Appointment of Principal Officers	Expanded
	5.03	8	Amendments to Articles of Incorporation or Bylaws	Expanded
	5.04	11	Temporary Suspension of Trading Under Registrant's Employee	No
	5.05	10	Amendments to the Registrant's Code of Ethics, or Waiver of a Provision of the Code of Ethics	No
7. Regulation FD Disclosure	7.01	9	Regulation FD Disclosure	No
8. Other Events	8.01	5	Other Events	No
9. Financial Statements and Exhibits	9.01	7	Financial Statements and Exhibits	No

A.1 The 2004 Disclosure Regulation

As discussed in Section 2, we focus on the 2004 Disclosure Regulation. In Table A2, we first show that the number of 8-K filings has indeed risen over the past decade and a half. The dependent variable is the natural logarithm of the number of 8-K filings per year. $Post2004$ is a dummy variable that equals one if the fiscal year is 2005 or after. Similar to McMullin et al. (2018), we also estimate models with firm-specific controls that can potentially explain 8-K filing frequency. We find a significant positive coefficient for our $Post2004$ dummy in each model, which confirms the burgeoning of 8-K filings post 2004.

The average firm in our sample had 3.5 8-K filings in 2002 and 6.4 filings in 2003. Starting in 2005, the number of firm 8-K filings more than doubled to approximately 12 filings and remained stable throughout the rest of the sample. Conditional on a firm filing an 8-K statement, Figure A.1 shows us the average number of 8-K files that firms made in a quarter from 1994-2016. A visual inspection of Figure 2 shows that there is a steep increase in the average number of quarterly firm 8-K filings between 2004 and 2005, coinciding with the 8-K regulation change.

In Table A2 Panel B, we perform a break test within the time series of quarterly firm 8-K's displayed in Figure 2 to determine where, if any, structural breaks occur in the time series. A test for structural breaks allows the data to independently tell us where the regime shift in 8-K frequency occurred. The break test is specified by:

$$AvgLogQuarterlyFiler8Ks_q = \alpha + \sum_{j=1}^{n} \beta_j \times 1_{\{q \geq q_j\}} + \epsilon_q \tag{3}$$

We estimate the number of breaks n and quarter of the breaks q_j using the methodology of Bai and Perron (2003, 1998). The breakpoint analysis estimates all possible regression models varying n and the values of q_j over the entire time series. For each possible regression, we estimate the Bayesian Information Criterion (BIC). In order to determine the optimal number of breaks within the time series, the specification with the minimum BIC level is selected. The first row in Table A2 Panel B shows that if one structural break is imposed, it

occurs in the third quarter of 2003, just before the regulation mandating the 8-K expansion, and the BIC is 71.499. However, the minimum BIC level is reached with two structural breaks, occurring in the first quarter of 2001 and the second quarter of 2004. This second break in the series of 8-K filings corresponds to the Disclosure Regulation change of 2004.

Table A2. Frequency of Filings

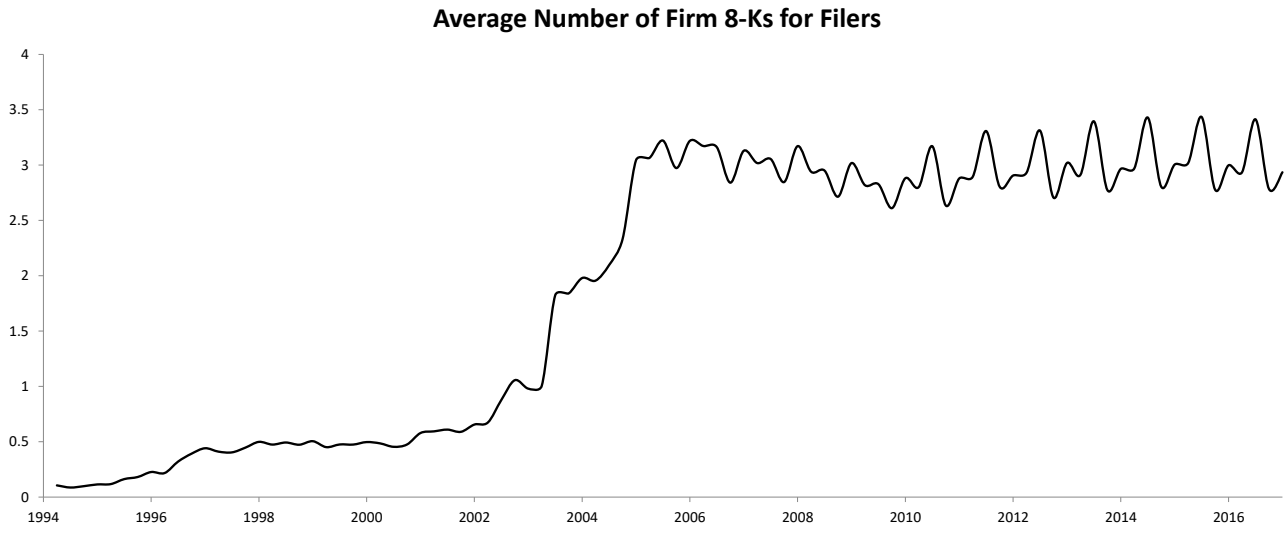
The table presents regression results of the change in the frequency of 8-K filings following the 8-K expansion regulation of 2004, as well as test of structural breaks in the the frequency of 8-K filings. Panel A presents regression results whereby the dependent variable is the natural log of the number of firm 8-K filings in a given year (*LogYearly8ks*). The variable *Post 2004* takes a value of 1 if the observation date is after 2004. Firm-level controls, defined in Appendix B, are computed at the annual level and lagged by one year, and industry fixed effects are included where indicated. Standard errors are clustered at the firm-level, and t-statistics are presented in parentheses. Panel B provides the results of the structural breaks test for the time series in $AvgLogQuarterlyFiler8K$ from 1994-2016. Conditional on a firm filing an 8-K, we compute the natural logarithm of the number of 8-K filings and then average this across firms. The breakpoint tests are specified as follows: $AvgLogQuarterlyFiler8Ks_q = \sum_{j=1}^{n} \beta_q \times 1_{\{q \geq j\}} + \epsilon_q$. We constrain to the selection of one optimal breakpoint in row one, two optimal breakpoints in row 2, and so on, until the optimal BIC is found.

Panel A. Yearly 8-K Filings			
	Log Number of 8Ks		
Post 2004	1.616	1.437	1.433
	(195.39)	(151.76)	(151.66)
LogAssets		0.105	0.107
		(27.76)	(26.71)
TobinsQ		0.0116	0.00839
		(6.99)	(5.13)
Cash		0.327	0.259
		(10.46)	(8.01)
SalesGrowth		-0.0429	-0.0431
		(-4.37)	(-4.53)
Return		0.0298	0.0325
		(8.06)	(8.78)
Skewness		-0.0219	-0.0207
		(-9.61)	(-9.16)
Volatility		4.003	3.797
		(15.01)	(14.69)
Turnover		0.000558	0.000464
		(1.88)	(1.80)
Industry FE	No	No	Yes
Observations	114790	81434	80726
Adjusted R^2	0.470	0.546	0.552

Table A2. Continued from previous page

Panel B: Breakpoints in number of 8-Ks after 1994						
No. of breaks	Break date(s)					BIC
1	–	–	2003 Q1	–	–	71.499
2	–	2001 Q1	2004 Q2	–	–	57.107
3	1997 Q1	2001 Q1	2004 Q2	–	–	59.711

Figure 2. 8-K's for Filers
The figure shows the evolution of the average number of 8-K filings per firm from 1994 to 2016. For each quarter in the sample, we plot the average number of 8-K filings for the firms in our sample.



B Variable Descriptions

Variable	Definition	Source
AnalystSpeed	This variable measures the speed at which equity analysts impound earnings news into their future forecasts. We collect data on the analyst forecasts, j, that are updated within 30 days of the firm's earnings announcement and then calculate the number of weekdays between the earnings announcement and the forecast update as calculated by: $AnalystSpeed = -1 \times log(\frac{1}{j}\sum_{j=1}^{j}[1 + Weekdaysuntilforecastupdate_j])$ Higher values indicate faster analyst updating	IBES
Cash	Firm Cash in millions of US dollars.	Compustat
EDGAR	This variable measures EDGAR download activity on earnings announcement days, t, relative to activity on other days by employing the following formula: $EDGAR = log(\sum_{t=0}^{1} EDGAR_t) - log(\frac{1}{7}\sum_{w=1}^{7}\sum_{t=-7w}^{7w+1} EDGAR_t)$ The first term is the sum of EDGAR 8-K downloads for the two days around the earnings announcement, while the second term is the average EDGAR 8-K downloads for the same two weekdays over the preceding seven weeks.	EDGAR
FirmsinQuarter	This variable counts the number of firms present in our sample within a given quarter.	EDGAR
$FrequentAfter$	This variable is an indicator variable that takes a value of 1 if the firm has more 8-K filings than the median level over the period 2005-2007.	EDGAR
$FrequentBefore$	This variable is an indicator variable that takes a value of 1 if the firm has more 8-K filings than the median level over the period 2001-2003.	EDGAR
LogQuarterlyFirm8ks	Natural log of the number of 8-K files a firm made in a given quarter, which is defined as 8KsinQuarter.	EDGAR
LogYearly8Ks	Natural log of the number of 8-K filings a firm makes in a given year, which is defined as Yearly8Ks.	EDGAR
QuarterlyFiler	An indicator variable taking the value of 1 if a firm files an 8-K file in a given quarter.	EDGAR
QuarterlyFirm8k	Number of 8-K files that a given firm has in a quarter	EDGAR
QuarterlyRSQ	Calculated as the coefficient of determination from a regression of firm excess returns on market and industry excess returns, where the model is defined as $r_t = \alpha + \beta_1 r_{mt-1} + \beta_2 r_{mt} + \beta_3 r_{mt+1} + \gamma_1 r_{it-1} + \gamma_2 r_{it} + \gamma_3 r_{it+1} + \epsilon_t$ where r_t, r_{mt}, and r_{it} are excess returns of the stock, the market, and the stock's industry during quarter t.	CRSP
QuarterlyTotal8Ks	This variable aggregates the total number of sample 8-K filings that we have in a given quarter.	EDGAR
SalesGrowth	Year over year change in firm sales, $sales_t - sales_{t-1}$, as a percentage of assets.	Compustat
$SUE1$	Quarterly-adjusted earnings surprise, $(EPS_q - EPSq - 4)/Price_t$	Compustat
$SUE2$	Earnings surprise with adjustment for special items (see Livnat and Mendenhall (2006))	Compustat
$SUE3$	Earnings surprise relative to analyst consensus, $(EPS_q - Consensus_{q-1})/Price_t$	Compustat and IBES
TobinsQ	Annual firm-level Tobin's Q, as calculated as (total assets + (shares outstanding-price) – common equity)/ total assets.	Compustat

YealyFiler	An indicator variable that takes a value of 1 if the firm filed an 8-K filing over the course of the year.	EDGAR
Yearly8Ks	Shows the total number of 8-K filings that a firm has in a given year	
Ret	Returns represent daily delisting-adjusted returns aggregated to the appropriate frequency (e.g. weekly)	CRSP
FF-adjust. Ret	Fama-French adjusted returns obtained as the difference between the realized delisting-adjusted return and the predicted return from a rolling Fama-French three-factor model	CRSP
iVol	Idiosyncratic volatility is the residual of annual regressions of the individual stock returns on the market return	CRSP
Announceβ	Announcement-week β is estimated from annual regressions of the individual stock returns on the market return with an indicator variable for announcement weeks	CRSP
Aggr. Earns.	Aggregate earnings is the sum of all quarterly earnings for all firm	Compustat