Why can't I trade? The exchanges' role in information releases

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May 2017

Abstract
Individual stock trading halts are an important tool that is increasingly being used by stock exchanges to prevent extraordinary price volatility in the presence of new information. Examining a sample of NYSE and NASDAQ halts from 2012 to 2015, we find them to be frequent events (98% of trading days have at least one halt and 72% of the days have at least five halts) that are increasing in use over time. We predict and find evidence consistent with NYSE having a lower need for halts than NASDAQ. We also predict and find evidence of an asymmetry in the use of halts depending on the direction of the underlying news. Specifically, it appears that a lower threshold of news is necessary to induce a halt for bad news than good news. Finally, we predict and find that this asymmetry between good and bad news is more pronounced in instances where the exchange has more discretion to issue a halt. Overall, we find evidence that stock exchanges are intermediaries that help determine how firm information is incorporated into price.

1. Introduction

An extensive literature in accounting and finance examines how firm information is incorporated into price. An important intermediary in this process that has received limited attention is the stock exchange. A key tool used by the exchanges to prevent extraordinary volatility is an individual stock trading halt (we refer to these as halts), which prevents trading in a stock around important information releases. While the evidence as to the effectiveness of these halts has been mixed (see Moise and Flaherty, 2017, for a review), their frequency continues to increase and halt policies and procedures continue to be refined. Despite the frequency and importance of halts, academic research has not investigated the role that exchanges play in determining when to issue a halt and for which stocks. In this study, we examine 1) the determinants of individual stock halts, 2) whether The New York Stock Exchange (NYSE) and The National Association of Securities Dealers Automated Quotation System (NASDAQ) differ in their use of halts, and 3) whether the direction of the underlying information is associated with the propensity to halt trading.

The purpose of stock exchanges is to allow buyers and sellers of securities to transact at fair and efficient prices. In order to accomplish this goal, the U.S. Securities and Exchange Commission (SEC), Financial Industry Regulatory Authority (FINRA), and stock exchanges have enacted a number of rules for U.S. listed firms. Some of these rules are designed to minimize extraordinary volatility and off-equilibrium trading.[1] The SEC is the ultimate authority on stock market regulation, however it relies heavily on recommendations from FINRA and individual exchanges. As a result, the exchanges have substantial discretion to implement the rules they

[1] See, for example, the SEC proposal to address extraordinary volatility in individual stocks and broader stock market (https://www.sec.gov/news/press-release/2012-2012-107htm), the SEC Plan to Address Extraordinary Market Volatility (https://www.sec.gov/news/press/2011/2011-84-plan.pdf) or the Oversight Hearing on Market Circuit Breakers (https://www.banking.senate.gov/98_01hrg/012998/witness/cochrane.htm), both as of 5/8/2017.

expect to most benefit their customers. In particular, the exchanges regulate the dissemination of and trading around value-relevant information. Not only does each exchange have firm disclosure requirements, they also have the ability to halt trading when new information comes to light.

To enhance our understanding of the attempts to mitigate extraordinary volatility in response to new information, we begin by providing descriptive evidence on the prevalence and types of halts as well as the price movements surrounding them. Prior studies have largely focused on the consequences of halt events using small sample sizes under prior regulatory regimes and found little consensus.[2] In contrast, our study focuses on a sample of halts from the recent regulatory environment (2012-2015). Halts during this period are frequent events – 98% of trading days have a halt and 72% of the days have at least 5 halts. Further, within our sample period there is an upward trend with 3.3% of sample firms experiencing at least one halt in the first quarter of 2012 compared to 9.2% in the last quarter of 2015. The median halt is just under seven minutes, though the mean is substantially longer at approximately 100 minutes given the presence of several extremely long halt events. Finally, the returns surrounding the halt event are substantial, as expected. The mean (median) 2-trading day return around the halt event (beginning at the market close prior to the halt) is 10.9% (4.6%).

Given the inherent discretion that exchanges maintain about when to halt trading in a stock, our first set of tests examine whether there is cross-sectional variation in how exchanges use halts. The exchanges' use of halts may be similar given they are both beholden to the SEC and FINRA regulations and they have similar overarching market structures. However, the exchanges also have several important differences. One key difference is that NYSE is regarded as more of a human-based market while NASDAQ is computer-based. In addition, the Designated Market

[2] See, for example King et al. (1992) Lee, Ready, and Seguin (1994), Corwin and Lipson (2000), and Christie, Corwin, and Harris (2002).

Makers (DMMs) at NYSE are charged with having a more proactive role in facilitating price discovery, dampening volatility, and adding liquidity than the Market Makers (MMs) at NASDAQ. As a result, our first hypothesis predicts that the active role played by the DMMs reduces the use of halts on NYSE. We find evidence consistent with our hypothesis that NYSE is less likely to halt trading. These results hold controlling for various firm characteristics, underlying information or news events, and fixed effects for time and industry.

We then shift our attention to the information underlying the halts – in particular, the direction of the news. While the SEC and FINRA halt guidance (and the exchange disclosure regulations) treat good news and bad news symmetrically, there are reasons to believe the exchanges may be more sensitive to bad news than good in implementing halts. First, the primary motivations surrounding the advent and evolution of stock halts are bad news events (i.e., market crashes). Second, market mechanisms exist that amplify bad news, but do not similarly affect good news (e.g., margin calls that force selling of stock in the face of bad news, further depressing prices). Finally, evidence suggests that individuals are more sensitive to decreases in financial wealth than increases (e.g., Kahneman and Tversky, 1979; Barberis, Huang, and Santos, 2001). We expect exchanges to reflect investor preferences and take a more aggressive stance on the negative side of news than the positive side. As a result, our second hypothesis predicts that bad news is more likely to cause exchanges to halt trading.

We find consistent evidence that bad news of a given magnitude is more likely to result in a halt than good news of that magnitude. We provide support for this in two different ways. First, we bifurcate the absolute returns surrounding the halt based on whether the sign is positive or negative. In these specifications, we find that more extreme returns in both directions are associated with halts, however the effect is substantially larger for bad news than for good.

Second, we include a good news indicator for positive returns while controlling for the magnitude of the news (i.e., halt return). The good news indicator is significantly negative consistent with good news being less likely to incur a halt, even after controlling for various firm characteristics, underlying information or news events, and fixed effects for time and industry. In total, these results suggest that a lower threshold of news is necessary to induce a halt for bad news than for good news.

We also explore whether the asymmetry in halts for good and bad news holds across exchanges. We find that, while good and bad news are each significantly associated with halts, bad news has a larger association than good news for both NYSE and NASDAQ. Thus, despite differential use of halts across the exchanges, both are more sensitive to bad news than good.

Finally, we predict that the asymmetry between good news and bad is more pronounced when the exchanges have more discretion to issue a halt. The SEC and FINRA guidelines on halts, along with the exchange regulations, are symmetric with respect to the direction of the news. Despite this fact, we expect to find an asymmetry between good and bad news due to the inherent discretion left to the exchanges. To test our hypothesis, we exploit the fact that stock exchanges have different types of halts at their disposal. For example, exchanges can issue news halts (discretionary halts in anticipation of expected market moving news), order imbalance halts (discretionary halts based on perceived inequities between buyers and sellers), and price limit halts (in response to large price movements).

We separately identify proactive attempts by exchanges to reduce extraordinary volatility by halting trading in advance of market moving news, as these halts are discretionary. In contrast, halts that occur in response to rapid price movements are often guided by explicit FINRA regulations, reducing discretion on the part of the exchange. Therefore, we partition our sample into proactive and reactive halts based on whether or not the halt is preceded by a large, rapid price movement and test whether the asymmetry between good and bad news is more pronounced for proactive versus reactive halts. Consistent with our prediction, we provide preliminary evidence that the exchanges appear to exhibit more asymmetry when issuing proactive halts versus reactive halts. This result provides important evidence that the discretion of exchanges plays an important role in how information is impounded into price.

This study makes several contributions to the literature. First, we contribute by providing insights into the role played by stock exchanges in how firm information is impounded into price. While the roles of other intermediaries have been studied extensively, the role of stock exchanges, though important, has not received attention. Both NYSE and NASDAQ fall under SEC and FINRA regulations and oversight, but fundamental differences in the exchanges (e.g., the emphasis on discretion and the role of humans) lead to different propensities to halt trading, even controlling for differences in the listing firms and amount of information occurring around halts. This also adds further insights into an important market mechanism relevant to market microstructure research using intraday data.

Second, we contribute to a greater understanding of individual stock halts in the current regulatory environment and determinants that underlie their occurrence. Specifically, we show that there is an asymmetry in the use of halts based on the underlying direction of news. This is consistent with a lower threshold of news being required to induce a halt for bad news than for good news. We also provide descriptive evidence on the type of information and firm characteristics associated with halts.

Finally, we provide a basis for evaluating halts depending on whether they appear to be proactive (i.e., based on anticipated news and price movement) or reactive (i.e., in response to information already in the public domain). Our classifications are correlated with NYSE halt classifications but allow for application across exchanges, which is currently a challenge for researchers as TAQ does not provide overlapping halt classifications across exchanges.

Section 2 provides background information on halts and exchanges while Section 3 lays out our hypotheses. Sample descriptives and empirical results are in Section 4. Finally, we conclude in Section 5.

2. Background on halts and exchanges

2.1 Individual stock trading halts

The key regulatory body overseeing the U.S. financial markets is the SEC. Its mission is to "protect investors, maintain fair, orderly, and efficient markets, and facilitate capital formation."[3] To achieve this, the SEC institutes regulations that govern the securities industry. During our period of study (2012-2015), FINRA, an independent regulatory organization, is overseen by the SEC and regulates stock markets.

While the SEC and FINRA provide guidance for exchanges that influence the timing and prevalence of halts, actual implementation is in the hands of the exchanges. In particular, both NYSE and NASDAQ employ a MarketWatch group to monitor market activity and oversee the disclosure requirements of listed-firms. MarketWatch evaluates whether news notifications from firms are material, monitors newswires, evaluates market activity, and communicates with the listed firm in ascertaining whether a halt is warranted (for ease of notation, we refer to

[3] In addition, "…the SEC requires public companies to disclose meaningful financial and other information to the public. This provides a common pool of knowledge for all investors to use to judge for themselves whether to buy, sell, or hold a particular security. Only through the steady flow of timely, comprehensive, and accurate information can people make sound investment decisions. The result of this information flow is a far more active, efficient, and transparent capital market that facilitates the capital formation so important to our nation's economy." Per https://www.sec.gov/Article/whatwedo.html as of 4/4/2017.

MarketWatch as the exchange hereafter).[4] We next discuss the various halt types used on NYSE and NASDAQ based on several sources from the key regulatory bodies including the SEC, FINRA, and the exchanges.[5]

The first type of individual stock halt, referred to as a news halt, occurs at the discretion of the exchange and is often declared in anticipation of a material news release (sometimes referred to as a regulatory halt).[6] When a halt of this type is imposed by the primary listing market, the halt must be honored on all other markets on which the security trades.

In addition to the SEC's disclosure rules for firms, the exchanges have their own, more stringent, disclosure guidelines. While the guidelines across exchanges are similar, there are minor differences. NYSE Listed Company Manual, Sections 201 and 202, address the disclosure and reporting of material information. Listed firms are required to "ensure timely disclosure of information that may affect security values or influence investment decisions, and in which shareholders, the public and the Exchange have a warrantable interest" (201.00). While the guidelines provide examples of specific types of information to be disclosed, the overall objective is "to release quickly to the public any news or information which might reasonably be expected to materially affect the market for its securities… A listed company should also act promptly to dispel unfounded rumors which result in unusual market activity or price variations" (202.05). In

[4] Per NASDAQ MarketWatch description (https://www.nasdaqtrader.com/Trader.aspx?id=MarketWatch); NYSE memo on Listed Company Guidance dated January 12, 2015 (https://www.nyse.com/publicdocs/nyse/regulation/nyse/2015_NYSE_Listed_Company_Compliance_Guidance_Memo_for_Domestic_Companies.pdf); and NYSE Timely Alert Reminder dated November 18, 2014 (https://www.nyse.com/publicdocs/nyse/regulation/nyse/timelyalertmemo.pdf), all as of 5/4/2017.

[5] See https://www.sec.gov/fast-answers/answerstradinghalthtm.html (as of 4/5/2017), http://www.finra.org/investors/alerts/when-trading-stops-halts-suspensions-other-interruptions (as of 4/5/2017) and NYSE Listed Company Manual and NASDAQ Equity Rules as noted.

[6] While we don't have documentation of when these halts were initiated, they have been in use by the exchanges since at least the mid-1970's as documented in Hopewell and Schwartz (1978).

addition to timely public release, listed firms are also required to notify the Exchange at least 10 minutes in advance of news releases occurring shortly before or during market hours (202.06).[7]

Given disclosure in advance of public release, NYSE "will be in a position to consider whether, in the opinion of the Exchange, trading in the security should be temporarily halted…" providing "… a period of calm for public evaluation of the announcement." In addition, if the Exchange believes it is necessary to request information from an issuer, they may halt trading until such information has been received and evaluated. (202.06)

NASDAQ Equity Rules Section 5250 provides guidelines on Exchange disclosure requirements and Sections 4120 and 4130 cover halts. In general, the disclosure requirements are similar to those of NYSE. Specifically, a "NASDAQ-listed Company shall make prompt disclosure to the public through any Regulation FD compliant method (or combination of methods) of disclosure of any material information…" Similar to NYSE, NASDAQ requires a 10 minute advance notification of such information prior to public release. However, NASDAQ has a wider early notification window. Specifically, the exchange requires at least ten minutes advanced notice prior to any public release of material information if the release is made between 7:00 a.m. and 8:00 p.m. If the public release is outside this window, the listed firm must notify the exchange before 6:50a.m. NASDAQ halt rules allow the exchange to halt trading in response to the receipt of material news, extraordinary market activity that is likely to have a material effect on the market for that security, or when the exchange has requested information related to the issuer's ability to meet the Exchange listing requirements or any other information necessary to "protect investors and the public interest."

[7] This requirement was amended towards the end of our sample window on Sept 2, 2015, to extend the disclosure window to begin at 7:00am (https://www.sec.gov/rules/sro/nyse/2015/34-75809.pdf)

The second type of halt is a price limit (sometimes referred to as a single-stock trading pause, a single-stock circuit breaker, or a security-level price limit). In response to the market crash in October 1987, President Ronald Reagan convened the Presidential Task Force on Market Mechanisms. The purpose of the task force was to determine what happened and why, and provide guidance to prevent similar events. The task force recommended the implementation of "circuit breaker mechanisms (such as price limits and coordinated trading halts)." Such mechanisms were believed to aid markets by limiting credit risk and loss of confidence amid "frenetic trading" and facilitating price discovery. In the wake of the crash, market-wide rules were imposed to halt trading in the face of significant market declines. These *market-wide* halts were a pre-curser to the *individual stock* price limits that result in halts.

The single-stock circuit break program was implemented following the "flash crash" on May 6, 2010. Leading up to our sample window, individual stock price limits were as follows: a 10% price movement within five minutes for S&P 500 and Russell 1000 Index firms, 30% for stocks priced at $1.00 or greater, and 50% for stocks below $1.00. Meeting the limit between 9:45a.m. – 3:35p.m. Eastern initiates a five minute halt, extendable at the exchange's option.

The SEC made minor changes to the price limits via the limit up-limit down guidelines that were approved on May 31, 2012 and were phased in beginning on April 8, 2013. The new guidelines are designed to focus on reducing occurrences of "extraordinary market volatility" and reduce the number of halts resulting from errors (Moise and Flaherty, 2017; Brogaard and Roshak, 2016; FINRA 13-12). While the old rules triggered halts given a price shift, the new rules require the use of pricing bands around a calculated reference price (the average traded price over the prior five minutes).[8] However, prior studies suggest that these changes were relatively minor.[9]

The third type is an order imbalance halt.[10] This type, used by NYSE but not NASDAQ, is exchange specific (i.e., it does not preclude trading in the stock on other markets).[11] In our sample, this type of halt occurs when NYSE deems there to be a significant order imbalance in the pending buy and sell orders for a security.

2.2 Prior literature on trading halts

Prior literature largely focuses on the outcome of halts (i.e., whether halts improve or hinder price formation). This focus stems from an ongoing debate between proponents and opponents of halts. Proponents argue that trading halts allow investors time to react to material news events and search for the appropriate price level (e.g., Schwartz, 1982; Greenwald and Stein, 1988, 1991; King et al., 1991; Kodres and O'Brien, 1994; Corwin and Lipson, 2000). Opponents argue that halts are an unnecessary barrier to market forces that limit the revelation of information in price and do not calm the markets (e.g., Brown and Jennings, 1989; Grundy and McNichols, 1989; Lee et al., 1994; Christie et al., 2002).

[8] The pricing bands are set a certain percent away from the reference price, depending upon the security (i.e., in the S&P 500 or Russell 1000 Index) and the reference price. Initially, and similar to prior guidelines, the pricing bands only apply from 9:45a.m. to 3:35p.m. The bands were subsequently extended to the first 15 minutes and last 25 minutes, with doubled pricing band parameters to accommodate the increased volatility. The stock enters a "limit state" for 15 seconds if one side of the market exceeds the limit band and the other side reaches the band (e.g., the national best bid (NBB) is below the lower band and the national best offer (NBO) is equal to the lower band or vice versa). If the quoted prices do not revert back into the allowable band range within 15 seconds, the exchange declares a 5-minute trading pause. The exchange can also pause trading when the security is in a "straddle state" (i.e., when it is not in a "limit state" but the NBB is below the lower band or the NBO is above the upper band).

[9] Brogaard and Roshak (2016) note that "the limit up-limit down rules are only slightly different from the [prior] rules" and Moise and Flaherty (2017) note that "[t]he price limits referenced in the academic literature are similar in nature to the price bands introduced by the [limit up-limit down] rules" and that these new rules are simply "a more finely calibrated mechanism."

[10] Similar to news halts, we do not know when order imbalance halts were initiated on NYSE, however, we do know they have been in use on NYSE since at least the mid-1970's as documented in Hopewell and Schwartz (1978).

[11] Note that we exclude from our sample any halts with trading during the halt window on other exchanges.

Recent studies document a continued interest in the outcomes of halts, particularly related to price limits and the limit up-limit down regulations. For example, Brogaard and Roshak (2016) document that price limits reduce the frequency and severity of extreme price movements, but induce price under-reaction. Further, SEC white papers explore the frequency of limit states, straddle states, trading pauses, and erroneous trades under the limit up-limit down regulations (e.g., Moise and Flaherty, 2017).

Though prior literature is largely focused on outcomes of halts, it acknowledges that they are a particularly interesting subset of information events because they occur frequently and are highly price informative (Hopewell and Schwartz, 1978; Lee, 1992). Despite this, surprisingly little is known about the types of firms and information associated with halts.[12]

2.3 Important differences between NYSE and NASDAQ trading environments

As of 2016, NYSE had 2,400 traded companies with a $25.8 trillion market cap, representing 87% of the Dow Jones Industrial average, 77% of the S&P500, and 80% of the Fortune 100.[13] Since 2006, NYSE has operated under a hybrid market model (approved by the SEC in Release 34-53539), which NYSE describes as a "hybrid electronic market with human oversight and accountability."[14] Currently, NYSE uses Designated Market Makers (DMMs). The DMMs are charged with maintaining "fair and orderly markets" for their respective securities through "high-tech automation for low latency and complete anonymity as well as high-touch participation by market professionals for orderly opens and closes, lower volatility, and deeper liquidity and price

[12] Further, descriptive evidence is also limited as prior work generally has used extremely small samples from periods that predate the current regulatory environments and halt types (e.g., it largely predates price limit halts and limit up-limit down guidelines). For example, King et al. (1992) is based on a sample of 129 NYSE trading halts from August to November of 1988.

[13] Per the NYSE website at https://www.nyse.com/2016-year-in-review as of 4/7/2017.

[14] The following discussion of NYSE and DMMs is based on information obtained at: https://www.nyse.com/market-model, https://www.nyse.com/publicdocs/nyse/listing/fact_sheet_dmm.pdf, https://www.nyse.com/publicdocs/nyse/listing/fact_sheet_slps.pdf, and NYSE Rule 104 (all as of 4/5/2017).

improvement opportunities." Their role is active as specified by the NYSE Listed Company Manual.[15] In addition to the human monitoring, there is an on-line computer system used to monitor the price movement of every listed stock. The system identifies any price movement that exceeds set guidelines for review by the exchange.[16]

Relative to NYSE, NASDAQ has more listed companies but a smaller market cap (the exchange website lists 3,800 firms with $10.1 trillion market cap as of 4/6/2017).[17] The exchange leans more toward technology with 74% of public technology firms and touts its success with IPOs. It also places a large emphasis on technology and automation in its system, running 85 marketplaces across 50 countries, including 10% of the world's securities transactions. The emphasis is on speed, reliability and "state-of-the-art routing capabilities" as key components of its success.

NASDAQ uses Market Makers (MMs), which are comprised of approximately 300 active registered independent dealers competing for orders by displaying buy and sell interests in listed securities. Similar to the DMMs at NYSE and in accordance with the 1997 SEC Order Handling Rules, they are required to display two-sided quotes in all securities in which they choose to make a market. The exchange averages 14 market makers per stock.

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[15]The manual specifies that, for the securities in which a DMM is registered, the DMM must engage in dealings for their own account in order to "assist in the maintenance of a fair and orderly market insofar as reasonably practicable. …[I]t is commonly desirable that a member acting as DMM engage to a reasonable degree under existing circumstances in dealing s for the DMM's own account when lack of price continuity, lack of depth, or disparity between supply and demand exists or is reasonably to be anticipated" (NYSE Rule 104 (f)(ii)). The DMM is also required to provide liquidity by maintaining a continuous two-sided quote. Specifically, they must maintain a bid or offer and the NBB and NBO for 10-15% of the trade-day, depending on average daily volume of the security for which the DMM unit is registered. (Per NYSE Rule 104 (a)(1)(A) of NYSE Rules).

[16] See NYSE Listed Company Manual Section 202.04.

[17] Exchange statistics per https://www.nyse.com/2016-year-in-review (4/7/2017). Other exchange details that follow are based on the following sources: http://business.nasdaq.com/discover/nasdaq-story/our-businesses, http://www.nasdaqomx.com/transactions/connectivity-services, and NASDAQ Equity Rules Section 4613.

While there are many similarities across NYSE and NASDAQ, some key differences arise as a result of their different models. One straightforward difference is the allowable trading hours. While NYSE allows trading during the standard market hours of 9:30a.m.– 4:00p.m. Eastern,[18] NASDAQ also provides extended hours both before the open (beginning as early as 4:00a.m.) and after the close (until 8:00p.m.). A more fundamental difference arises from the hybrid model that NYSE touts as using a combination of computer automation and human judgment, where the human judgment is considered a key advantage.[19] In particular, the DMMs are expected to be proactive and intervene to help maintain fair and orderly markets for their respective securities. For example, NYSE Rules specify that the DMMs are charged with trading in "their own account when lack of price continuity, lack of depth, or disparity between supply and demand exists or is reasonably to be anticipated" (NYSE Rule 104 (f)(ii)). In addition, DMMs have specific requirements with respect to providing liquidity by maintaining a continuous two-sided quote for 10-15% of the trade-day (NYSE Rule 104 (a)(1)(A)).

On the other hand, the NASDAQ MM requirements are more minimal and passive. NASDAQ Rules require a MM to "engage in a course of dealings for its own account to assist in the maintenance, insofar as reasonably practicable, of fair and orderly markets" and "buy and sell such security for its own account on a continuous basis during regular market hours and shall enter and maintain a two-sided trading interest" (NASDAQ Equity Rules Section 4613).

[18] These hours are for NYSE and NYSE MKT. NYSE ARCA and NYSE BONDS both have extended trading windows. Our study focuses on NYSE.

[19] As stated on the NYSE website, "[i]t's the human element at NYSE that results in lower volatility, deeper liquidity, and improved prices… This high touch approach is crucial for offering the best prices, dampening volatility, adding liquidity and enhancing value. DMMs apply their market experience and judgment of dynamic trading conditions, macroeconomic news and industry-specific intelligence, to inform their decisions. A valuable resource for our listed company community, DMMs offer insights, while making capital commitments, maintaining market integrity, and supporting price discovery." (https://www.nyse.com/market-model as of 4/5/2017)

3. Hypothesis development

3.1 NYSE versus NASDAQ

As noted above, NYSE has DMMs who are obligated to provide liquidity even in the presence of large price movements (i.e., resist the tide). Their obligations include maintaining bids and offers at the NBB and NBO prices for at least 10% of the trade day (NYSE Rules, Rule 104).[20] Further, they must commit their own capital to increase liquidity in the market and to trade against imbalances, both of which work to smooth prices and minimize volatility. In addition, the DMMs maintain communication with the various market participants including the listed firm, trading desk, and floor brokers.

In contrast, the NASDAQ system uses automated MMs that do not have the same obligations to proactively intervene in the market to smooth pricing and reduce volatility. NYSE claims their system better reduces stock price volatility and is therefore a reason that firms should choose NYSE over NASDAQ. To the extent that this mechanism is effective, NYSE stocks, ceteris parabis, should face lower extraordinary volatility and, therefore, have a reduced need for halts (relative to NASDAQ firms). As a result, we predict the following:

H1: NYSE is less likely to halt trading in individual stocks than NASDAQ.

While we predict fewer halts on NYSE than NASDAQ, the disclosure requirements and trading pause guidelines at each exchange arise from common SEC and FINRA regulations. Further, both exchanges have similar, albeit not identical, market structures and objectives (e.g., to reduce extraordinary volatility) as well as disclosure regulations for listed firms. As such, it is possible that, in the face of similar firm characteristics, information environments, and information events, both exchanges have a similar propensity to halt trading.

[20] The 10% obligation increases to 15% for firms with average daily volume less than one million shares.

3.2 Good news versus bad news

We next turn to the information that underlies halts. There are several reasons why one would expect that the direction of the underlying news would affect the likelihood of a halt. First, the events underlying the motivation for halts are all large bad news events (i.e., market crashes). As such, the exchanges may be more inclined to identify and halt trading for large bad news than for large good news. Second, existing market mechanisms are more likely to amplify the reaction to bad news than good. For example, margin calls triggered by bad news can exacerbate downward price movement by forcing investors to sell stock, further depressing prices.[21] Third, there is substantial evidence in the behavioral finance literature that individuals are more sensitive to reductions in financial wealth than increases, often referred to as loss aversion (e.g., Kahneman and Tversky, 1979; Thaler and Johnson, 1990; Gertner, 1993; Barberis, Huang, and Santos, 2001). We expect stock exchange behavior to reflect investor preferences and take a more aggressive stance on reducing extraordinary volatility related to bad news than good news. As a result, we predict the following:

H2a: Bad news is more likely than good news to result in a halt (i.e., the direction of news is asymmetrically associated with halts)

Building off the asymmetry predicted in H2a, we expect any asymmetry in halts based on the underlying direction of news to vary with the level of discretion accorded the exchanges. First, there is no indication that any asymmetry results from the SEC and FINRA guidelines or the exchange regulations with respect to halts or disclosure of news. Second, H2a is predicated on the fact that the exchanges maintain discretion in halting trading. As a result, we expect the asymmetry

[21] This is similar to the "downward spiral" or "death spiral" scenario used to describe the use of fair market value accounting around the financial crisis (see, for example, Ball, 2008).

predicted in H2a to be more pronounced in settings where the exchanges have more discretion to halt trading. As a result, we predict the following:

H2b: The asymmetry (between news direction and halts) is greater when exchanges use more discretion to issue halts.

Alternatively, we may not find results consistent with these predictions for several reasons. First, regulators do not expect the exchanges to exercise discretion based on the direction of the news. For example, FINRA explicitly notes that "the more likely the announcement is to affect stock price, *whether positively or negatively*, the more likely the exchange is to call for a trading halt…" (emphasis added).[22] Second, the halt rules themselves (e.g., price limit rules) are symmetric and do not differentiate between good news and bad news. Third, the disclosure requirements for listed firms do not differentiate based on the direction of news, suggesting that the exchanges would consider both news directions similarly. In fact, the NYSE Manual, Section 202.06 explicitly states that "[u]nfavorable news should be reported as promptly and candidly as favorable news." Finally, short selling constraints work against our predictions. With respect to good news, investors are able to buy stock and thus respond to good news. However, with respect to bad news, short-selling limitations constrain investor response by limiting their ability to sell.

4. Empirical evidence

4.1 Sample Selection

We use two different research designs to test our hypotheses. The first is a broad sample of firm-quarters from 2012-2015, where each firm-quarter is defined as a halt observation if at least one halt event occurs for that firm during that quarter. All other firm-quarters are non-halt

[22] See: http://www.finra.org/investors/alerts/when-trading-stops-halts-suspensions-other-interruptions as of 5/8/2017.

observations. The second sample is based on 8-K filings with the SEC during the same four-year window. As halt events are the result of material information (actual or rumor-based) that underlies extraordinary price volatility, we begin with all 8-K filings as they are required by the SEC to "announce major events."[23] We then match each halt to the closest 8-K with the day prior and day of the halt.[24] The remaining unmatched 8-K filings comprise our no-halt sample.

Table 1 provides the details of our sample selection. Panel A summarizes our halt identification strategy and sample selection, whereas panel B (panel C) summarizes the firm quarter (8-K) samples that we use to test our formal hypotheses. We use the TAQ quote files from 2012 to 2015 to identify instances of halts on NYSE, NASDAQ, and AMEX. Consistent with prior literature, we identify halts in the TAQ quote files by searching for non-standard condition codes (e.g., Christie et al., 2002).[25] This yields a sample of 27,787 halts.

We then perform steps to ensure our sample observations are appropriate for, and have sufficient data to, perform the analyses. We begin by removing halts related exchange-wide shutdowns, as these halts are not relevant for our research questions. We then merge the resulting sample with CRSP and Compustat and retain only common stock or ADR securities (eliminating ETFs). We also eliminate 'halts' where trading occurred on other exchanges, as Chakrabarty et al. (2011) document that these non-regulatory (primarily order-imbalance halts) have different trading environment characteristics than true halts. Finally, we restrict our sample to one halt per firm per day (i.e., when there are multiple halts in a given day, we keep the first for which there are five

[23] See https://www.sec.gov/fast-answers/answersform8khtm.html as of 4/13/2017.
[24] We allow for the day of and day after match because filings occurring late in the day may affect trading early in the following day.
[25] Specifically, we search for quotes where the condition code is in ("D", "P", "I", or "M") and the bid and offer prices are zero. Next, we also search for quotes where the condition code is equal to "N", but do not require the bid and offer prices to be zero, as these observations also have the characteristics of trading halts. We validate this procedure with a sample of trading halts in November of 2016 by comparing it to a listing on nasdaqtrader.com.

minutes of prices preceding the halt) and remove the halts related to AMEX. This yields a sample of 7,914 halts for 2,391 unique firms.

Our firm-quarter sample begins with all 109,939 firm quarter observations on CRSP from 2012 to 2015. We then apply similar filters to those used for our halt sample (keep common stock and ADR observations, merge with Compustat, drop AMEX observations) and require market value of equity to be non-missing at the end of the prior quarter. These filters result in a firm-quarter sample of 66,460 observations (5,413 firms). Finally, we merge the resulting sample with our halt sample from above to identify firm-quarters with an associated halt.

Our 8-K sample begins with the population of 8-Ks filed with the SEC from 2012 to 2015, downloaded from EDGAR using Python. We then use Python to obtain acceptance dates and times, 8-K line item types, company identification information, and other details. This procedure results in 298,695 8-K filings. We again apply similar filters to those used for our halt sample (merge to Compustat/CRSP/TAQ, retain common stock and ADRs, drop AMEX) and require the observations to have non-missing two-day returns surrounding the 8-K filing date (the returns window begins at the market close preceding the 8-K acceptance) and prior quarter controls. This results in 168,187 8-Ks across 4,189 firms. Finally, we merge the resulting sample with our halt sample by matching 8-Ks to a halt on the day of or the day after the 8-K acceptance date. In the event that a halt is matched to multiple 8-Ks, we select the match with the closest proximity between the 8-K acceptance date/time and the time that the halt begins (i.e., the closest 8-K is coded as having a halt, whereas the other 8-Ks are coded as not having a halt).

4.2 Descriptive evidence on halts

We begin by providing descriptive evidence on halts. Figure 1 provides evidence on the frequency of halts on NYSE and NASDAQ from 2012 to 2015. Consistent with prior literature, we provide evidence that halts are common events across these exchanges. After removing halts that do not meet our sample requirements, we find that the most common occurrence in our sample period is 4 halts in a day (which occurred on 85 trading days in our sample). Further, 98% of the trading days have at least one halt and 72% of the trading days have at least 5 halts. In total, Figure 1 documents that halts are frequent events on NYSE and NASDAQ.

Figure 2 provides additional details on the prevalence of halts through time. Specifically, it shows the percent of firms-quarters associated with a halt during our sample period. The percent of firms experiencing a halt increased from 3.3 percent of firms in the first quarter of 2012 to 9.2 percent of firms in the fourth quarter of 2015. Interestingly, Figure 2 also provides descriptive evidence that halts appear to be more common in the fourth quarter of the calendar year.

Additionally, in Figure 2 we also provide descriptive evidence on the firms experiencing "reactive" and "proactive" halts. Specifically, for each of the halts in our sample with stock return data for the five minutes preceding, we classify the halt as proactive or reactive (this entails a small loss of sample resulting in 6,496 halts with the sub-classification). We code instances where the absolute value of the five-minute stock return (as calculated via midpoints of the bid-ask spread) prior to the halt is greater than or equal to five percent as reactive and instances where the return is less than five percent as proactive. Similar to the trend for all halts, both proactive and reactive halts exhibit an upward trend. The percent of firms encountering a proactive (reactive) halt increased from 2.0 percent (0.9 percent) to 5.2 percent (4.8 percent) from 2012 to 2015.

While our classification scheme for proactive and reactive halts allows for uniform classification across exchanges, it does not map perfectly into the halt types discussed in Section 2.2 above. Though the TAQ database includes codes to identify halt types for NYSE-listed firms, this detail is suppressed for NASDAQ-listed firms (i.e., all NASDAQ halts in TAQ are assigned the same code). Specifically, TAQ does not provide unique condition codes across halt types for NASDAQ halts (i.e., all halts appear to be coded with the condition code "N," or "Non-Firm Quote"). In Panel A of Table 2 we provide a summary of our halt classification scheme across the various quote condition codes. We expect news dissemination ("D") and news pending ("P") to be predominantly coded as "proactive" in our classification scheme. In contrast, we expect additional information ("M") to be coded as "reactive" as this quote condition appears to be primarily reserved for price limit halts. We do not have any expectations regarding the order imbalance ("I") halts. Consistent with our expectations, we find that 92% of the classifiable news disseminated and news pending halts are coded as proactive, whereas 84% of the additional information ("M") halts are coded as proactive.

In Panels B and C of Table 2, we provide additional descriptive statistics on the individual halt sample. Panel B provides distributions across the entire individual halt sample and Panel C compares NYSE and NASDAQ halt observations. We begin by providing details on the duration (or length) of the halt in minutes. The interquartile range is 31 minutes, increasing from 5 minutes at the first quartile to 36 minutes at the third quartile. The mean duration is substantially longer, however, at 101 minutes. This reflects the presence of extremely long halts, or those that do not resume within in the trading day.[26] Next, we provide details on the information associated with the halts. Consistent with prior literature (e.g., Bhattacharya and Spiegel, 1998), we show that halts are associated with large price changes on average. Specifically, the average absolute 2-trading day return (beginning at the prior market close) is greater than 10%. Our sample is also evenly distributed between good and bad news halts (according to these same returns).

[26] We code halts that do not resume during the trading day with a resumption time of 11:59 p.m.

In the second portion of Panel B, we provide descriptive statistics on the intraday returns (based on the mid-point of the bid-ask spread) immediately surrounding the halt. On average, we show an absolute return of 6% in the 10-minute window preceding the halt, 7% during the halt, and 4% in the 10-minute window following the halt.

Finally, in Panel C of Table 2 we compare these same statistics across NYSE and NASDAQ halts. The mean duration across the two exchanges is not significantly different at roughly 100 minutes, however the median duration of approximately 8 minutes for NASDAQ halts is significantly greater than that for NYSE halts (5 minutes). Regarding the information associated with the halts, NASDAQ has significantly larger mean returns (11%) than NYSE (9%), however the median returns are not significantly different (5%). Further, NYSE has a larger proportion of good news halts over our sample period (53%) than NASDAQ (49%). The intraday returns for NASDAQ halts are all significantly greater than those for NYSE, with NASDAQ having absolute average returns of 6% in the 10-minute window before the halt, 7 % during the halt, and 4% after the halt, compared to 5%, 3%, and 3% for NYSE halts, respectively.

To complete our descriptive evidence on halts, we provide plots of the 30-second returns (based on the mid-point of bid-ask spreads) from 10-minutes prior to the halt to 10-minutes after the halt in Figure 3. We partition our plots on good and bad news according to the total return across this interval. We also provide return plots for proactive and reactive halts separately to illustrate our classification scheme. Each of our plot lines represent an equal-weighted average of the corresponding halts. That is, we first calculate the series of cumulative 30-second returns for each halt in the particular subgroup and then plot the average of the subgroup at each interval.

In Panel A, we show the plots for the halts associated with good news returns. The dashed portion of each line represents the change in price during the halt (time 0). Each of the plots displays a large price change during the halt. As expected, a large (small) portion of the cumulative return occurs before the halt for reactive (proactive) halts. Specifically, almost 85% of the average cumulative return for reactive halts occurs before the halt begins, whereas only 15% occurs before proactive halts. Panel B provides fairly consistent trends for bad news halts. That is, approximately 78% (1%) of the average cumulative return for bad news reactive (proactive) halts occurs before the halt begins. Interestingly, the majority of the plots display at least some element of drift following the halt (particularly in the first 30 seconds following the halt). Finally, comparing across panels A and B, the average magnitude of return around the halt is larger for good news (11%) than for bad news (8%).

4.3. Tests of H1 – Differential use of halts across exchanges

We test Hypothesis 1 that NYSE is less likely to halt trading than NASDAQ, in Tables 3 and 4. Table 3 provides details on the first set of analyses, using the firm-quarter sample. We use univariate and multivariate tests to compare the halt and no-halt samples across an indicator variable for whether the firm is traded on NYSE or NASDAQ (*NYSE*) as well as proxies for firm characteristics and information events. The control variables we include are those that are likely to influence a firm's propensity to have trading in their stock halted. Proxies for firm characteristics are measured as of the prior quarter and include firm size (*LnMVE*), trading volume (*Volume*), stock price volatility (*Volatility*), analyst coverage (*LnNumAnalysts*), and percent institutional ownership (*InstOwn*). We also include four proxies for the magnitude of information occurring during the quarter: absolute value of returns (*AbsRet*), the absolute value of the most extreme daily return (*AbsExtremeRet*), the number of 8-K filings (*LnNum8Ks*), and whether the firm issued a management forecast (*MgmtFcst*).

As shown in Panel A, all variables differ significantly between the halt and no-halt samples. The halt sample contains smaller firms with lower institutional ownership and analyst coverage. Halt firms also have less volume of stock traded and a more volatile stock price. The firm-quarters with halts also have greater absolute returns, a greater absolute extreme daily return, and more 8-Ks filed with the SEC, though are less likely to have issued management forecasts. Finally, the χ^2 test of *NYSE* is consistent with our prediction that NYSE is less likely to halt trading than NASDAQ. The probability of a NYSE-listed firm experiencing a halt in a given quarter is only 2.8% compared to 7.8% for a NASDAQ-listed firm (untabulated), for a 5.0% difference.

Panel B shows the results using a multivariate Logit model regressing halts on the listing exchange. In Column 1, where we include *NYSE* and fixed effects (both time and industry), but no control variables, *NYSE* is significantly negative with a marginal effect of 4.1%. Moving from NYSE to NASDAQ leads to an increase in probability of having a halt from 2.7% to 6.8%, suggesting the fixed effects explain 18% percent of the 5.0% unconditional difference noted above.

In Column 2, we control for firm characteristics and information events by including the variables from Panel A as controls.[27] The results suggest that, holding all other characteristics at their mean values, NYSE continues to have a significantly lower propensity to halt trading than NASDAQ, though the magnitude of the marginal effect is lower at 2.0%. Moving from NYSE to NASDAQ leads to an increase in probability of having a halt from 2.9% to 4.9%. In addition, higher trading volume increases the propensity for a halt, as do more information events (measured using the number of 8-K filings) and more extreme events (measured using the absolute value of the most extreme daily return in the quarter). Though we do not have predictions about

[27] Note that there is a small loss of sample in the Logit regressions in Panel B relative to Panel A. This occurs as certain industries perfectly predict the halt outcome (i.e., no halts occur in that category) and, therefore, the category is dropped. This loss of sample occurs throughout the various Logit analyses in the study, resulting in slight variations in sample size.

subcategories of halts, Columns 3 and 4 show that our finding of fewer halts for NYSE firms holds for both proactive and reactive halt types.

Table 4 provides details on the second set of analyses, using 8-K filings. Similar to the analysis in Table 3, we examine the same firm characteristics, though we alter the information proxies. Given that each halt is matched to an 8-K, we include indicators for the most frequent 8-K topics, the absolute return for the two-day window around the halt (*AbsEventRet*), and whether the filing was made during market hours (*MktHoursIndicator*).

Panel A shows the univariate tests for all variables other than the 8-K topic indicators. Similar to the firm-quarter level tests, all firm characteristics across the halt and no-halt samples are statistically different. Also similar is the result for the *NYSE* indicator, suggesting that NYSE is less likely to halt trading than NASDAQ. We include two proxies that relate to the information events surrounding the 8-K. First, the two-day absolute returns are larger for the halt sample, consistent with larger information events being associated with halts. Second, we find that the 8-Ks associated with halts are less likely to occur during market hours, consistent with the notion that firms tend to release more material information during periods where the market is closed to allow investors to process the information.

Panel B provides details on the most frequent 8-K topics in our sample. There are 18 topics (out of 31 possible) that are associated with halt events. As each 8-K can have more than one topic, we tabulate the percent of halts associated with a given topic, such that the percentages across topics total more than 100%. Only five topics are associated with at least 5% of the halt events. Panel B tabulates the details for the topics associated with halts. The most frequent two topics cover Financial Statements and Exhibits (*I901*) and Results of Operations and Financial Condition (*I202*) and are associated with 85% and 46% of the halt sample, respectively.

Finally, Panel C shows the results from the Logit model of halts regressed on the listing exchange. Similar to Table 3, we begin with just the *NYSE* indicator and fixed effects (quarter-year and industry) in Column 1 and then add control variables in Column 2. We also include indicator variables for the five most prevalent 8-K topics associated with halts (i.e., those associated with greater than 5% of halts). Consistent with the firm-quarter results above, *NYSE* is significantly negative, indicating firms listed on NYSE have fewer halts. In terms of economic magnitudes, in Column 1 with only industry and year fixed effects, moving from NYSE to NASDAQ approximately doubles the probability of having a halt around an 8-K filing, increasing the probability from 0.5% to 1.0%. When we add in control variables in Column 2, this translates to an increase in halt probability from 0.4% at NYSE to 0.7% at NASDAQ. When we examine the halt subcategories of proactive (Column 3) and reactive (Column 4), it appears the result derives from the proactive halt sample.

Overall, the results across both samples are consistent with NYSE using significantly fewer halts than NASDAQ. This inference holds controlling for various firm characteristics, the amount of information released during the respective period, and time and industry fixed effects.

4.4. Tests of H2a – Asymmetry in halts based on the direction of underlying news

We test Hypothesis 2a, that bad news is more likely than good to result in a halt, using the same firm-quarter and 8-K samples. We first discuss the results using the firm-quarter sample.

Table 5 Panel A provides univariate tests across the halt and no-halt samples of the magnitude and direction of underlying information. We define the information variables based on the day in the quarter with the most extreme absolute return (*AbsExtremeRet*). We assume this is the day most likely to have a halt. The average extreme absolute return for the halt sample (18.7%) is significantly larger than that of the no-halt sample (9.3%). The most extreme day for our halt sample has good news (positive returns) 63% of the time as compared to 60% for the no-halt sample (*GoodNewsIndicator*). We then split *AbsExtremeRet* based on whether the underlying information event is good news (positive returns) or bad news (negative returns) and find that the halt sample has significantly larger mean extreme returns than the no-halt sample for both good (12.7% compared to 5.9%) and bad news (6.0% compared to 3.4%).

We show results from the multivariate Logistic model regressing *Halt* on the information variables and control variables in Panel B. Our primary specification is shown in Column 1 where we regress *Halt* on the extreme absolute value of returns split based on good and bad news, along with the control variables and fixed effects. We reiterate that the variables of interest are the most extreme daily returns during the quarter (*AbsExtremeRet_GoodNews* and *AbsExtremeRet_BadNews*), which proxy for the potential magnitude and direction of news underlying the halt. In contrast, the return control variable (*AbsRet*) measures the returns for the entire quarter to control for the overall amount of news occurring.

While both *AbsExtremeRet_GoodNews* and *AbsExtremeRet_BadNews* are positive and significant, the coefficient on bad news is larger (Wald χ^2 statistic is 29.99, p-value<0.01), consistent with H2a. If *AbsExtremeRet_GoodNews* increases from 4.6% to 11.6% (the interquartile range of *AbsExtremeRet*), the probability of a halt increases by 1.9% (moving from 3.6% to 5.5%). With respect to bad news, if *AbsExtremeRet_BadNews* increases by the interquartile range, the probability of a halt increases by 2.7% (moving from 4.3% to 7.0%). The difference in halt propensity between good and bad news represents 14% of the base rate of halts (5.7% of firm-quarters in the sample have a halt event).

Column 2 is an alternate specification in which we include *GoodNewsIndicator* and *AbsExtremeRet* rather than bifurcate *AbsExtremeRet* based on good and bad news. Consistent with our primary specification, controlling for the magnitude of news, good news is less likely than bad news to result in a halt.

In light of our findings in Section 4.3 that the exchanges differ in their use of halts, we examine whether the asymmetry noted above holds across exchanges. The results of the primary specification using NYSE-listed firms are in Column 3 and NASDAQ-listed firms are in Column 4. In both columns, *AbsExtremeRet_GoodNews* and *AbsExtremeRet_BadNews* are significantly positive and the bad news coefficient is statistically larger than the good news. Thus, while the magnitudes and significance of the coefficients and the difference appear larger for NASDAQ firms, the asymmetry exists in both exchanges.

Table 6 shows the univariate and multivariate tests of H2a using the 8-K sample. Panel A provides univariate tests across the halt and no-halt samples. For these analyses, the event return equals the two-day return for the day of the 8-K through the day following (*AbsEventRet*). This window should allow us to capture the "news" surrounding the halt event regardless of whether the halt occurs before the news (e.g., a proactive halt) or after (e.g., a reactive halt). The absolute return surrounding the 8-K is significantly larger for those filings associated with halts (10.7%) than those not (3.7%) and a lower proportion of the events are good news for the filings with halts (42.4% of 8-Ks with halts have positive returns versus 51.4% without halts), both consistent with our expectations. Finally, the magnitude of the absolute returns associated with good news (*AbsEventRet_GoodNews*) and that associated with bad news (*AbsEventRet_BadNews*) are both greater for the 8-Ks associated with halts.

Panel B shows the results from the Logistic model using the 8-K sample. Similar to Table 5, the first column presents our primary specification using *AbsEventRet_GoodNews* and *AbsEventRet_BadNews* as our variables of interest. Consistent with the Table 5 results, we find that the returns to good and bad news are both positively associated with a halt but, for a given magnitude of news, there is a larger probability of halting for bad news than good (Wald χ^2 statistic is 63.31, p-value<0.01). Importantly, increasing the bad news returns from 0.9% to 4.7% (the interquartile range of *AbsEventRet*) increases the probability of a halt by 45% more than a similar increase in good news returns (0.29% increase for bad news versus 0.20% increase for good). While these increases may appear small at face value, they represent 22% and 32% of the base rate, respectively (0.9% of 8-Ks in the sample are associated with a halt). Similar to Table 5, we also show consistent results using the alternative specification in Column 2 where, controlling for the magnitude of the news, there is a lower propensity to halt for good news than bad (*EventGoodNewsIndicator* < 0). This asymmetry also holds across exchanges (Columns 3 and 4).

Overall, our results in Table 6 are consistent with Hypothesis 2a, that a halt is more likely to be associated with bad news than good news. The inferences are consistent across specifications using different measures of news, different samples and across listed firms on both exchanges.

4.5. Tests of H2b – The role of discretion in the halt-news direction asymmetry

We test Hypothesis 2b, that the asymmetry between the direction of news and halts is greater when exchanges use more discretion to issue halts, using the same firm-quarter and 8-K samples. To test whether the asymmetry in halts depends on the amount of discretion used, we require a setting where discretion varies. We use the proactive-reactive bifurcation of the halt sample to proxy for the level of halt discretion.

Proactive halts, by their very nature, are discretionary as the exchange opts to halt trading prior to significant market movement (i.e., the absolute returns in the five minutes prior are less than 5%). In contrast, reactive halts are subject to the more direct FINRA guidelines for price limits. Specifically, when the price movements are severe enough to meet the price limit guidelines, a (non-discretionary) halt is automatically enacted. While it is likely that there are some discretionary halts within the reactive halt category, they are still likely to entail less discretion on average than the proactive halts.

We first show the results using the firm-quarter sample in Table 7. Column (1) shows the results using proactive halts as the dependent variable, whereas Column (2) uses reactive halts. For both halt types, good news and bad news returns are associated with a halts. Further, we continue to find an asymmetry in the direction of news for both types (i.e., a given level of bad news is more likely to induce a halt than a similar level of good news). Importantly, however, the economic magnitude of this asymmetry is noticeably greater for the proactive halts. When moving across the interquartile range of *AbsExtremeRet*, the difference in halt propensity between good and bad news is 0.46% for proactive halts, but only 0.12% for reactive halts.[28] These differences represent 14% of the proactive halt base rate (3.3%), but only 5% of the reactive base rate (2.3%).

Table 8 shows the tests of H2b using the 8-K sample. As in Table 7, the first column shows the results with proactive halts as the dependent variable, whereas the second column uses reactive halts. Our Table 8 results are consistent with those in Table 7, as the returns to good and bad news are both positively associated with a both halt types but, for a given magnitude of news, there is a larger probability of halting for bad news than for good.[29] Consistent with our H2b prediction, however, the economic magnitude of this asymmetry is noticeably greater for the proactive halts. Specifically, when moving across the interquartile range of *AbsEventRet*, the difference in halt propensity between good and bad news is 0.06% for proactive halts, but only 0.02% for reactive

[28] If *AbsExtremeRet_GoodNews* increases from 4.6% to 11.6% (the interquartile range of *AbsExtremeRet*), the probability of a proactive (reactive) halt increases by 0.76% (0.29%), moving from 2.31% to 3.07% (1.07% to 1.36%). With respect to bad news, if *AbsExtremeRet_BadNews* increases by the interquartile range, the probability of a proactive (reactive) halt increases by 1.22% (0.41%), moving from 2.61% to 3.84% (1.18% to 1.59%).

[29] As a reminder, the variation in sample sizes results from particular industries perfectly predicting the halt outcome.

halts.[30] These differences represent 12% of the proactive halt base rate (0.51%), but only 8% of the reactive base rate (0.25%).

Collectively, the results in Tables 7 and 8 provide preliminary evidence consistent with our prediction that the asymmetry between good and bad news is more pronounced in instances where the exchange has more discretion to issue a halt.

5. Conclusion

Individual stock trading halts are an important tool used by stock exchanges to mitigate extraordinary price volatility in the presence of new information. Despite their importance and frequency, little is known about the role of the exchanges in halts around information events and, therefore, their role in how firm information is impounded into price. In this study, we examine the underlying determinants of halts, whether NYSE and NASDAQ differ in their use of halts, whether there is an asymmetry in the use of halts based on the news direction, and the role of exchange discretion in any asymmetry.

We first provide descriptive evidence that halts are frequent and important events on NYSE and NASDAQ between 2012 and 2015. Specifically, 98% of trading days have at least one halt and 72% have at least five halts. The mean return in the 2-day window surrounding the halt is 10.9%. Second, we predict and find evidence consistent with NYSE using fewer halts than NASDAQ. This is consistent with NYSE's DMMs taking a more proactive role in facilitating price discovery, dampening volatility, and adding liquidity than NASDAQ's MMs. Third, we predict and find evidence of an asymmetry in the use of halts depending on the direction of the

[30] To provide further clarity, if *AbsEventRet_GoodNews* increases from 0.9% to 4.7% (the interquartile range of *AbsEventRet*), the probability of a proactive (reactive) halt increases by 0.18% (0.06%). With respect to bad news, if *AbsEventRet_BadNews* increases by the interquartile range, the probability of a proactive (reactive) halt increases by 0.12% (0.04%).

underlying news. A lower threshold of news is necessary to induce a halt for bad news than good news, consistent with exchanges being more concerned about bad news. Finally, we find preliminary evidence consistent with the asymmetry in the use of halts for good and bad news information events being greater when exchanges use greater discretion in halts.

This study makes several contributions to the literature. First, we contribute by providing insights into the role of stock exchanges in how information is impounded in price – in particular, through the use of a halt. Second, we contribute to a greater understanding of halts in the current regulatory environment and determinants that underlie their occurrence. Specifically, we provide descriptive evidence on the type of information and firm characteristics associated with halts and show that there is an asymmetry in the use of halts based on the underlying direction of news. Third, we identify the exchanges as an important, under-researched intermediary whose discretion plays an important role in determining how information events are impounded into price. Finally, we provide a basis to evaluate different halt types across various exchanges. Given that TAQ does not provide overlapping halt classifications across exchanges, we devise a method for evaluating halts depending on whether they appear to be proactive (i.e., based on anticipated news and price movement) or reactive (i.e., in response to information already in the public domain).

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Appendix A: Variable Definitions

Trading Halt Variables:

Halt	= 1 if there is an individual stock trading halt, 0 otherwise.
Proactive_Halt	= 1 if there is a proactive-individual stock trading halt, 0 otherwise. We define a halt as proactive if the 5-minute return immediately preceding the halt (calculated using midpoints of the bid-ask spread) is less than 5 percent.
Reactive_Halt	= 1 if there is a reactive-individual stock trading halt, 0 otherwise. We define a halt as reactive if the 5-minute return immediately preceding the halt (calculated using midpoints of the bid-ask spread) is greater than or equal to 5 percent.

Independent Variables of Interest:

NYSE	= 1 if the firm is listed on NYSE, 0 if the firm is listed on NASDAQ.
AbsExtremeRet	= the absolute value of the most extreme daily return from the current quarter, where extreme is the largest in magnitude regardless of sign.
GoodNewsIndicator	= 1 if the most extreme daily return from the current quarter is positive, 0 otherwise.
AbsExtremeRet_GoodNews	= *AbsExtremeRet* if the most extreme daily return from the current quarter is positive, 0 otherwise.
AbsExtremeRet_BadNews	= *AbsExtremeRet* if the most extreme daily return from the current quarter is not positive, 0 otherwise.
AbsEventRet	= the absolute value of the two-day return beginning with the close prior to the 8-K acceptance time.
EventGoodNewsIndicator	= 1 if the 2-day return beginning with the close prior to the 8-K acceptance time is positive, 0 otherwise.
AbsEventRet_GoodNews	= *AbsEventRet* if the two-day return beginning with the close prior to the 8-K acceptance time is positive, 0 otherwise.
AbsEventRet_BadNews	= *AbsEventRet* if the two-day return beginning with the close prior to the 8-K acceptance time is not positive, 0 otherwise.

Control Variables:

LnMVE	= log (market value of equity as of the end of the prior quarter).
Volume	= volume (in billions of shares) in the prior quarter.
Volatility	= standard deviation of daily stock returns in the prior quarter.
LnNumAnalysts	= log (1 + number of analysts following the firm in the prior quarter)
InstOwn	= the proportion of shares (from 0 to 1) owned by institutional investors as of the end of the prior quarter, calculated using data from Thomson Reuters.
AbsRet	= the absolute value of the stock return for the current quarter.

LnNum8Ks	= log (1 + number of 8-Ks filed with the SEC during the current quarter).
MgmtFcst	= 1 if there is a management forecast issued during the current quarter, 0 otherwise.
MktHoursIndicator	= 1 if the 8-K is accepted by the SEC within standard market hours (9:30a.m. – 4:00p.m. Eastern Time), 0 otherwise.
I901	= 1 if the 8-K includes topic I901 (Financial Statements and Exhibits), 0 otherwise.
I801	= 1 if the 8-K includes topic I801 (Other Events), 0 otherwise.
I701	= 1 if the 8-K includes topic I701 (Regulation FD Disclosure), 0 otherwise.
I202	= 1 if the 8-K includes topic I202 (Results of Operations and Financial Condition), 0 otherwise.
I101	= 1 if the 8-K includes topic I101 (Entry into a Material Definitive Agreement), 0 otherwise.

Figure 1: Average number of individual stock trading halts per day
This figure shows the average number of individual stock trading halts, per day, for firms listed on NYSE and NASDAQ between 2012 and 2015.

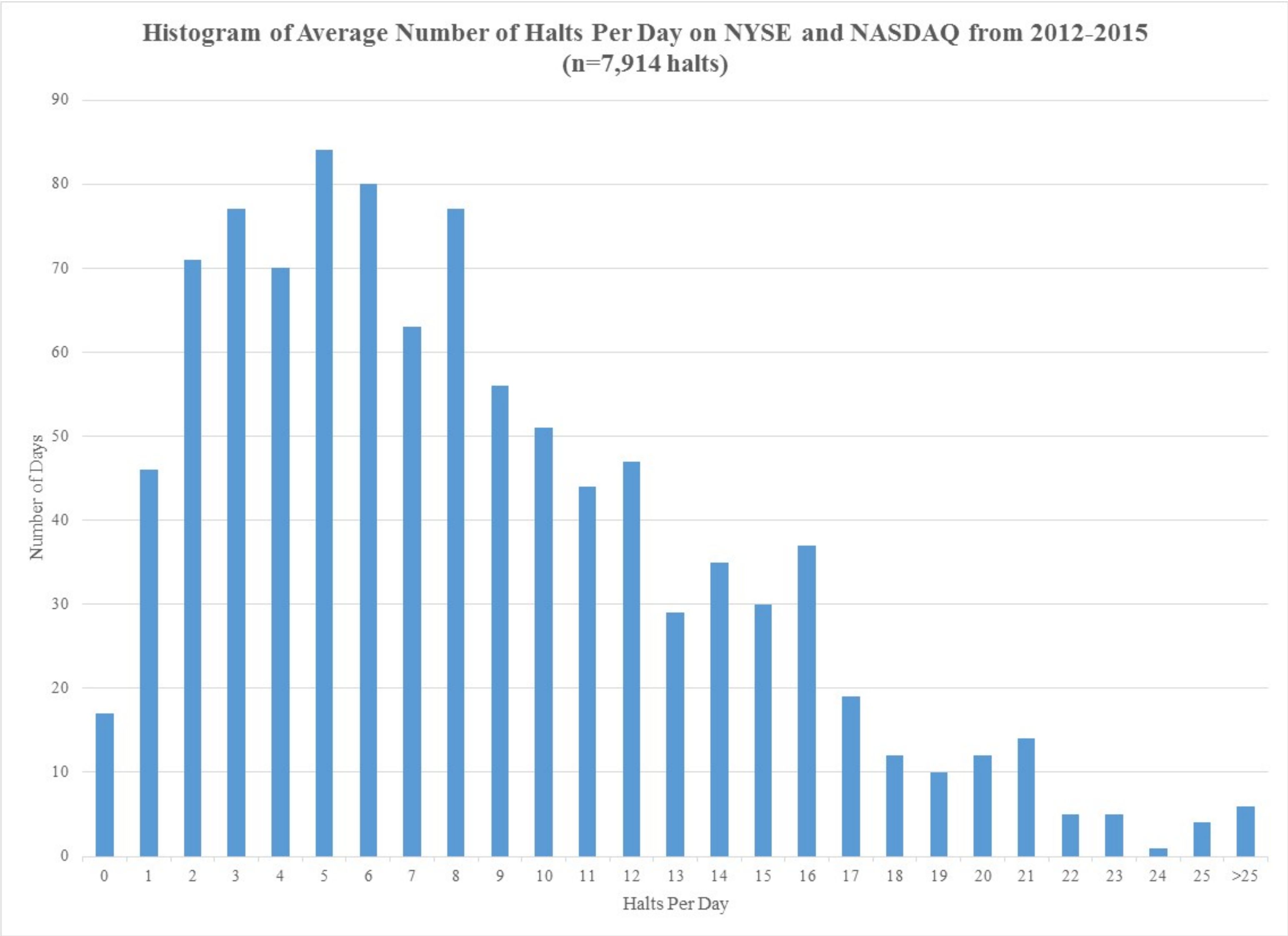


Figure 2: Percent of traded firms halted
This figure shows the percent of listed firms on NYSE and NASDAQ that have halts each quarter between January 1, 2012 and December 31, 2015 for the full halts sample as well as the proactive and reactive subsamples.

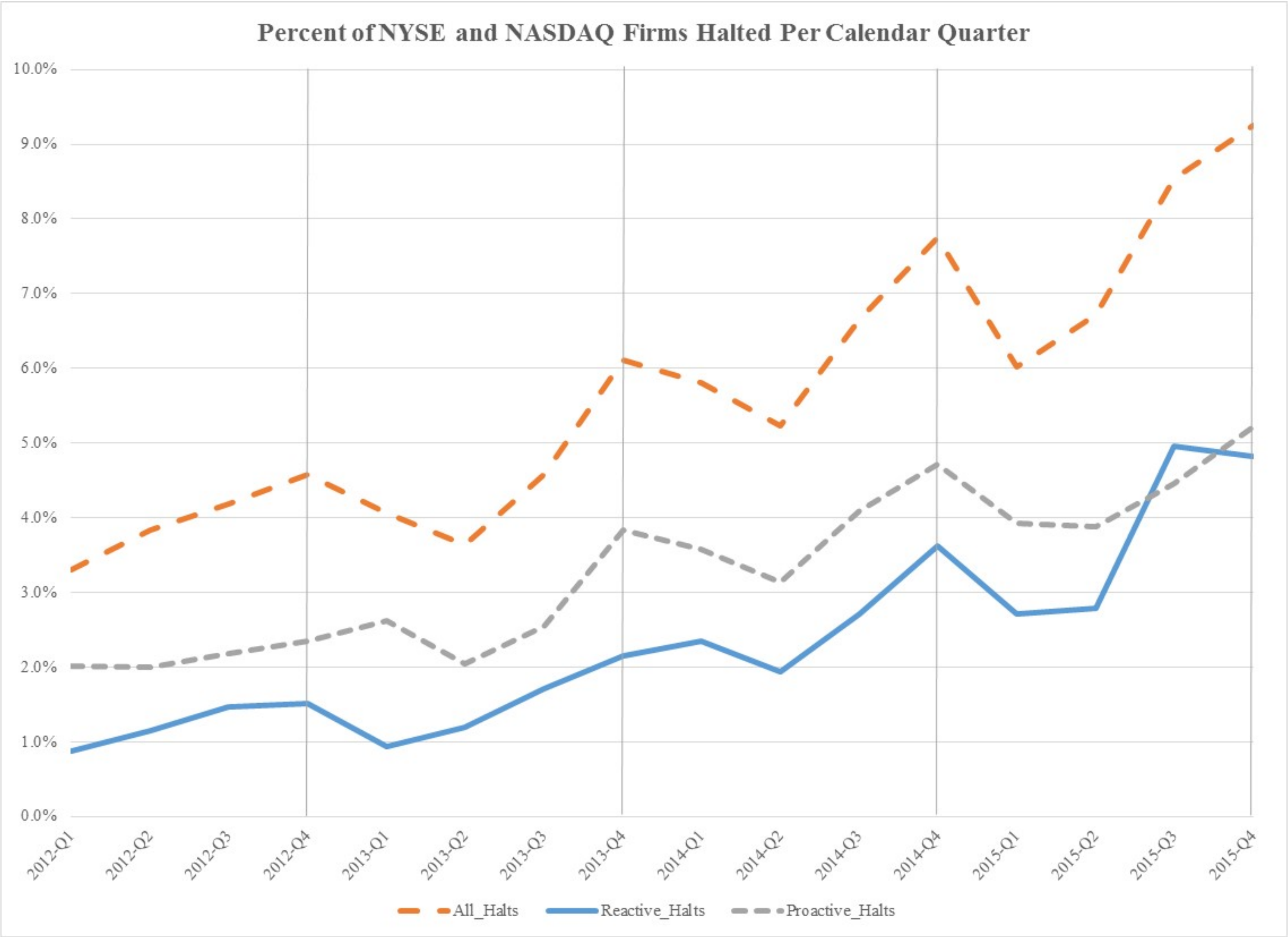
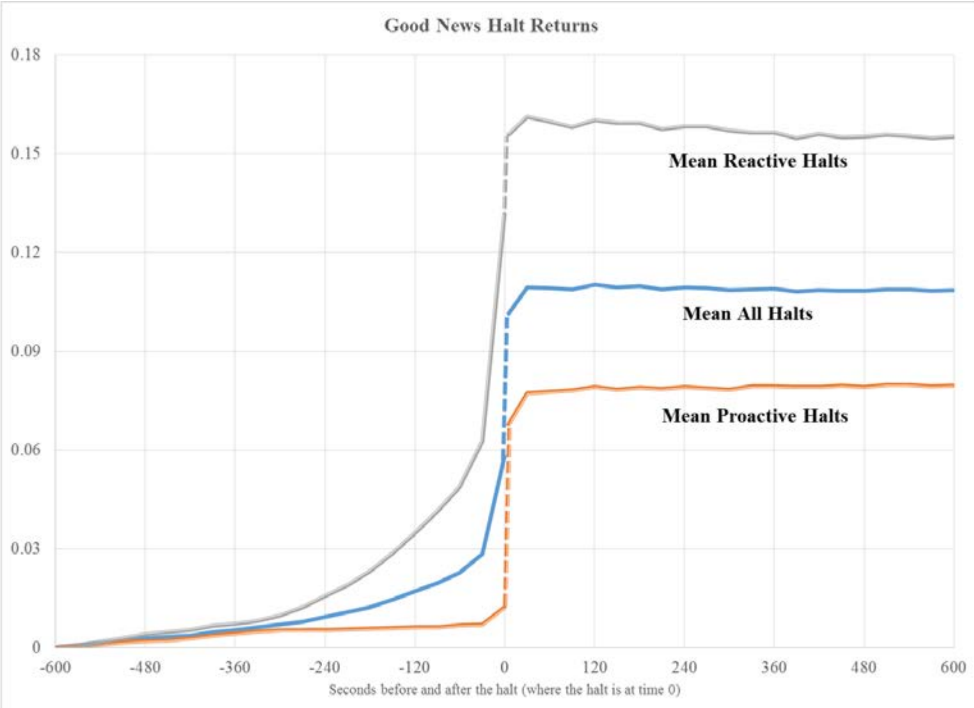


Figure 3: Returns surrounding halts
These figures plot the 30 second returns for the 10 minutes before the halt and 10 minutes following the halt. We compute returns based on the midpoint of the bid-ask spread. Therefore, we require observations to have regular quotes with spreads less than 100 percent of the midpoint to enter this analysis (n=4,824 halts). Panel A provides the returns for 2,532 good news halts, whereas panel B provides the returns for 2,292 bad news halts. We define good news (bad news) halts as those observations where the return from 10 minutes prior to the halt to 10 minutes after the halt is greater than (less than or equal to) zero.

Panel A: Good news



Panel B: Bad news

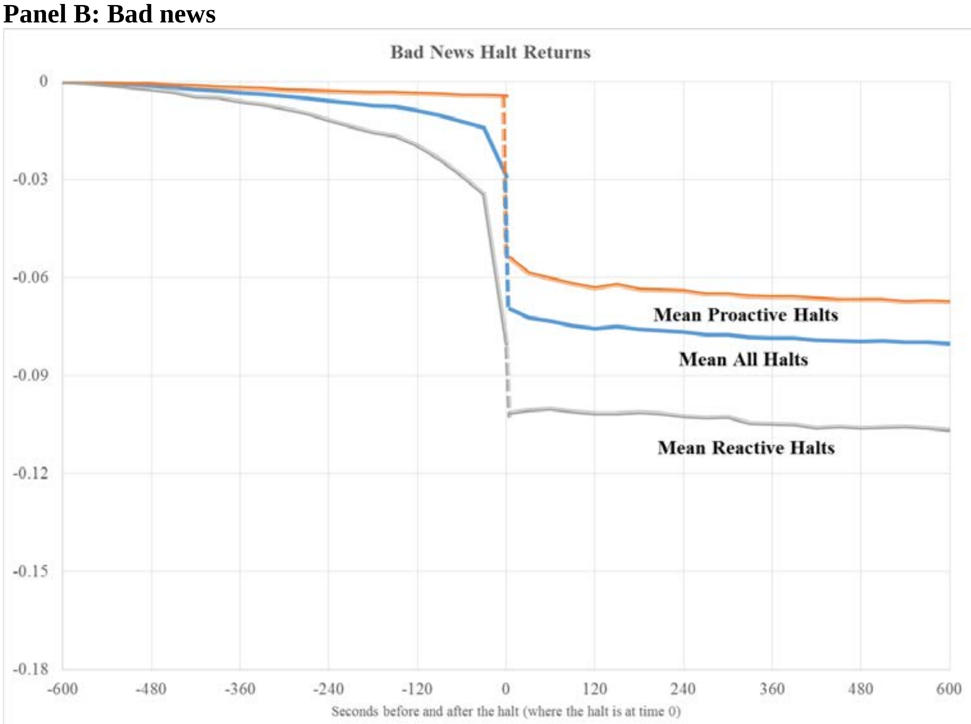


Table 1: Sample selection

This table shows the details for the samples used in this study. Panel A shows the sample selection to arrive at the individual firm halt sample, and the unique firms (unique TAQ symbols) that underlies the sample. Panel B shows the sample selection to arrive at the firm-quarter sample, and the unique firms (unique PERMNOs) that underlie. Finally, Panel C shows the sample selection to arrive at the 8-K sample, and the unique firms (unique CIKs) that underlie.

Panel A: Summary of halts

	Halt Observations	*Unique Symbols*
Total distinct NYSE/NASDAQ/AMEX Halts identified in TAQ [(1)]	27,787	5,625
Less: halts on days with extreme halt activity (i.e., exchange-wide halts) [(2)]	(5,828)	(1,298)
Less: halts without CUSIP/Company identification information in TAQ	(2,006)	(119)
Less: halts without a successful merge to CRSP	(6,935)	(600)
Less: halts that relate to securities other than common stock or ADRs (i.e., only include SHRCD=10, 11, 12, 30, 31)	(1,205)	(516)
Less: halts without a successful merge to COMPUSTAT (or no available CIK)	(449)	(40)
Less: halts with trading during the halt	(1,612)	(490)
Common stock halts in the intersection of TAQ, CRSP and Compustat	9,752	2,562
Restrict to one halt per day (select first halt with 5-min preceding returns)	(1,347)	0
Less: AMEX Halts	(491)	(171)
Total Common stock halts (one per firm per day)	7,914	2,391

Panel B: Summary of firm-quarter sample

	Firm Quarters	*Unique Firms*
CRSP Firm Quarters with MVE available at end of calendar quarter	109,939	8,723
Less: observations where MVE is missing at end of prior calendar quarter	(2,151)	(124)
Less: observations that relate to securities other than common stock or ADRs (i.e., only include SHRCD=10, 11, 12, 30, 31)	(36,337)	(2,974)
Less: observations with missing CIKs in Compustat merge	(653)	(42)
Less: AMEX observations (exchcd=2)	(4,338)	(170)
Total firm quarters	66,460	5,413

Table 1 (continued)

Panel C: Summary of 8-K sample

	#8-Ks	*Unique Firms*
8-Ks filed on EDGAR 2012-2015	298,695	11,094
Less: observations without a CIK merge to Compustat	(44,343)	(3,944)
Less: observations without a CRSP merge	(49,904)	(2,074)
Less: observations with missing returns surrounding 8-K filing date	(4,725)	(49)
Less: observations without a link to TAQ	(70)	0
Less: observations that relate to securities other than common stock or ADRs (i.e., only include SHRCD=10, 11, 12, 30, 31)	(19,894)	(530)
Less: observations with missing prior quarter controls	(2,539)	(62)
Less: AMEX observations (exchcd=2)	(9,033)	(246)
Total 8-Ks	168,187	4,189

Other Notes:

(1) Halts beginning in the same 5-second window on different NASDAQ exchanges (i.e., exchange codes "T", "B", and "X") are considered to be the same halt.

(2) Halts on dates with more than 1,000 halts in the day are excluded. This consisted of four dates: 3/25/13, 8/22/13, 11/22/13, and 8/24/15. No other dates had 200 or more halts. Media reports acknowledge exchange-wide shutdowns on 8/22/13 and 8/24/15 (see for example: http://www.reuters.com/article/us-nasdaq-halt-tapec-idUSBRE97L0V420130822 and http://money.cnn.com/2015/08/24/investing/stocks-markets-selloff-circuit-breakers-1200-times/)

Table 2: Halt descriptives

This table provides descriptive statistics on the halt sample. Panel A shows the 7,914 halts defined using TAQ quote code as well as our proactive and reactive classification scheme. Proactive and reactive halts are defined based on the 5-minute return preceding the halt, where those with returns less than (greater than or equal to) 5 percent are coded as proactive (reactive). Panel B shows various descriptive statistics for the 7,914 halts. Details are provided on the length of the halt (in minutes), absolute returns for the two days around the halt (beginning at the market close prior to the halt), and the percent of these observations that are good news based on these two-day returns. We also provide descriptive statistics on the intraday returns in the interval from ten minutes prior to and following the halt for a subsample of the halts that have regular quotes with spreads less than 100 percent of the midpoint over the entire interval (n=4,824). Panel C provides a comparison of the halts for NYSE-listed firms and NASDAQ-listed firms. Tests of differences are based on two-sided ttests for means, Wilcoxon rank-sum tests for medians, and χ^2 tests for binary variables.

Panel A: Summary of halt sample by halt type

	Quote Condition Code (TAQ Description)											
	NYSE								*NASDAQ*			
	"D" News Dissemination		"P" News Pending		"I" Order Imbalance		"M" Additional Information		"N" Non-Firm Quote		**Total**	
All Halts	53		313		469		239		6,840		7,914	
Classification of Halts												
Reactive Halts	5	9%	18	6%	125	27%	193	81%	2,519	37%	2,860	36%
Proactive Halts	19	36%	246	79%	262	56%	37	15%	3,072	45%	3,636	46%
Unable to Classify (No Returns Info)	29	55%	49	16%	82	17%	9	4%	1,249	18%	1,418	18%
Total Halts	53	100%	313	100%	469	100%	239	100%	6,840	100%	7,914	100%

Panel B: Halt descriptives

	N	Mean	25th	Median	75th	StdDev
Halt Duration (in minutes)	*7,914*	101.019	5.000	6.774	36.142	233.947
2 day Absolute Return (beginning at close before halt)	*7,374*	10.9%	1.3%	4.6%	12.8%	16.8%
Good News Indicator (2 trading day return)	*7,374*	0.499	0.000	0.000	1.000	0.500
Absolute Return 10 minutes before halt begins	*4,888*	6.3%	0.5%	2.7%	8.6%	8.7%
Absolute Return during the halt (from halt to resume)	*4,888*	6.6%	1.0%	3.2%	7.7%	9.6%
Absolute Return 10 minutes after trading resumes	*4,888*	4.0%	0.3%	1.9%	5.6%	5.4%

Panel C: Comparison of NYSE and NASDAQ halts

	NYSE Halts (n=1,074)		NASDAQ Halts (n=6,840)		Test of Difference (p-values)	
	Mean	Median	Mean	Median	Mean	Median
Halt Duration (in minutes)	103.8530	5.3733	100.5740	7.8482	0.69	<0.01
2 day Absolute Return (beginning at close before halt)	9.3%	4.6%	11.1%	4.6%	<0.01	0.55
Good News Indicator (2 trading day return)	0.5302	1.0000	0.4940	0.0000		0.04
Absolute Return 10 minutes before halt begins	5.1%	1.5%	6.5%	3.0%	<0.01	<0.01
Absolute Return during the halt (from halt to resume)	2.7%	0.9%	7.3%	3.7%	<0.01	<0.01
Absolute Return 10 minutes after trading resumes	3.0%	1.4%	4.2%	2.0%	<0.01	0.08

Table 3: Tests of H1 (firm-quarter sample)

This table provides details on the tests of H1 using the firm-quarter sample. Panel A provides descriptive statistics and univariate tests across the halt and no-halt samples (*Halt*). Tests of differences are based on two-sided ttests for means, Wilcoxon rank-sum tests for medians, and χ^2 tests for binary variables. Panel B provides multivariate logistic regressions of the halts (*Halt*) on the exchange indicator (*NYSE*), control variables, and time and industry fixed effects. Time fixed effects use quarter-years and industry fixed effects use 2-digit SIC codes. Variable definitions provided in Appendix A. Regression marginal effects are calculated holding all other covariates at the sample mean. Regression standard errors are Huber/White robust estimators clustered by firm.

Panel A: Univariate Statistics

	Halt=1 (n= 3,764)		*Halt=0* (n= 62,696)		Test of Difference (p-values)	
	Mean	Median	Mean	Median	Mean	Median
$NYSE_t$	0.2067	0.0000	0.4346	0.0000		<0.01
$LnMVE_{t-1}$	5.4944	5.3478	6.5709	6.5430	<0.01	<0.01
$Volume_{t-1}$	0.0516	0.0072	0.0642	0.0170	<0.01	<0.01
$Volatility_{t-1}$	0.0404	0.0336	0.0246	0.0204	<0.01	<0.01
$LnNumAnalysts_{t-1}$	1.2009	1.0986	1.6670	1.7918	<0.01	<0.01
$InstOwn_{t-1}$	0.4002	0.3494	0.5163	0.5642	<0.01	<0.01
$AbsRet_t$	0.2303	0.1667	0.1492	0.1040	<0.01	<0.01
$AbsExtremeRet_t$	0.1868	0.1357	0.0925	0.0686	<0.01	<0.01
$LnNum8Ks_t$	1.1545	1.3863	1.1028	1.0986	<0.01	<0.01
$MgmtFcst_t$	0.3329	0.0000	0.4813	0.0000		<0.01

Panel B: Logistic Regressions

Dependent Variable:	***$Halt_t$***		***$Halt_t$***		***$Proactive\_Halt_t$***		***$Reactive\_Halt_t$***	
	(1)		(2)		(3)		(4)	
	Margin	*z-stat*	Margin	*z-stat*	Margin	*z-stat*	Margin	*z-stat*
Primary Variable								
$NYSE_t$	-0.0411	*-16.21* ***	-0.0196	*-8.01* ***	-0.0137	*-7.14* ***	-0.0030	*-2.83* ***
Prior Quarter Control Variables								
$LnMVE_{t-1}$			-0.0005	*-0.48*	-0.0002	*-0.25*	-0.0005	*-1.26*
$Volume_{t-1}$			0.0275	*2.59* ***	0.0229	*2.85* ***	0.0076	*1.82* *
$Volatility_{t-1}$			-0.1600	*-1.33*	-0.0102	*-0.11*	0.2117	*4.62* ***
$LnNumAnalysts_{t-1}$			-0.0105	*-6.50* ***	-0.0060	*-4.94* ***	-0.0053	*-8.23* ***
$InstOwn_{t-1}$			0.0030	*0.77*	0.0029	*0.99*	0.0015	*0.89*
Current Quarter Control Variables								
$AbsRet_t$			0.0022	*0.51*	-0.0050	*-1.41*	-0.0034	*-1.94* *
$AbsExtremeRet_t$			0.2418	*13.33* ***	0.1053	*7.50* ***	0.0399	*5.64* ***
$LnNum8Ks_t$			0.0042	*2.65* ***	0.0015	*1.19*	-0.0001	*-0.20*
$MgmtFcst_t$			-0.0027	*-1.21*	-0.0022	*-1.26*	-0.0014	*-1.52*
Fixed Effects	*Time, Industry*		*Time, Industry*		*Time, Industry*		*Time, Industry*	
Psuedo R-Square	*0.053*		*0.129*		*0.087*		*0.190*	
Area under ROC	*0.683*		*0.767*		*0.738*		*0.825*	
N	*66,267*		*66,267*		*65,278*		*64,991*	

Table 4: Tests of H1 (8-K sample)

This table provides details on the tests of H1 using the 8-K sample. Panel A provides descriptive statistics and univariate tests across the halt and no-halt samples (*Halt*). Tests of differences are based on two-sided ttests for means, Wilcoxon rank-sum tests for medians, and χ^2 tests for binary variables. Panel B shows the details on the 8-K topics associated with trading halts. Panel C provides multivariate logistic regressions of the halt and no-halt sample (*Halt*) on the exchange indicator (*NYSE*), control variables, and time and industry fixed effects. Time fixed effects use quarter-years and industry fixed effects use 2-digit SIC codes. Variable definitions provided in Appendix A. Regression marginal effects are calculated holding all other covariates at the sample mean. Regression standard errors are Huber/White robust estimators clustered by firm.

Panel A: Univariate Statistics

	Halt=1 (n= 1,513)		*Halt=0* (n= 166,674)		Test of Difference (p-values)	
	Mean	Median	Mean	Median	Mean	Median
$NYSE_t$	0.2366	0.0000	0.4235	0.0000		<0.01
$LnMVE_{t-1}$	6.1085	6.1422	6.8020	6.7727	<0.01	<0.01
$Volume_{t-1}$	0.0786	0.0181	0.0884	0.0233	0.04	<0.01
$Volatility_{t-1}$	0.0387	0.0312	0.0254	0.0204	<0.01	<0.01
$LnNumAnalysts_{t-1}$	1.6050	1.7918	1.8185	1.9459	<0.01	<0.01
$InstOwn_{t-1}$	0.5357	0.5783	0.5777	0.6407	<0.01	<0.01
$AbsEventRet_t$	0.1065	0.0818	0.0373	0.0214	<0.01	<0.01
$MktHoursIndicator_t$	0.1851	0.0000	0.2223	0.0000		<0.01

Panel B: Frequency of 8-K topics associated with trading halts

		Halt=1 (n= 1,513)		*Halt=0* (n= 166,674)	
Line #	*Line Description*	Frequency	Pct of Total	Frequency	Pct of Total
I901	*Financial Statements and Exhibits*	1,284	84.9%	123,510	74.1%
I202	*Results of Operations and Financial Condition*	689	45.5%	51,358	30.8%
I801	*Other Events*	470	31.1%	38,871	23.3%
I701	*Regulation FD Disclosure*	304	20.1%	31,509	18.9%
I101	*Entry into a Material Definitive Agreement*	232	15.3%	19,979	12.0%
I302	*Unregistered Sales of Equity Securities*	50	3.3%	2,288	1.4%
I503	*Amend Articles, Bylaws, Fiscal Year End*	37	2.4%	4,197	2.5%
I507	*Submit Matters to a Vote of Security Holders*	31	2.0%	12,989	7.8%
I301	*Notice of Delisting / Transfer of Listing*	27	1.8%	1,389	0.8%
I402	*Non-Reliance on Previously Issued Financials*	25	1.7%	260	0.2%
I203	*Creation of a Direct Financial Obligation*	21	1.4%	7,702	4.6%
I201	*Acquisition or Disposition of Assets*	21	1.4%	2,670	1.6%
I102	*Termination of a Material Definitive Agreement*	20	1.3%	2,081	1.2%
I206	*Material Impairments*	10	0.7%	351	0.2%
I204	*Events that Increase Direct Financial Obligation*	6	0.4%	187	0.1%
I401	*Changes in Registrant's Certifying Accountant*	4	0.3%	785	0.5%
I103	*Bankruptcy or Receivership*	4	0.3%	26	0.0%
I504	*Suspend Trading Under Employee Benefit Plans*	1	0.1%	138	0.1%

Table 4 (continued)

Panel C: Logistic Regressions

Dependent Variable:	***Halt$_t$***			***Halt$_t$***			***Proactive_Halt$_t$***			***Reactive_Halt$_t$***		
	(1)			(2)			(3)			(4)		
	Margin	*z-stat*		Margin	*z-stat*		Margin	*z-stat*		Margin	*z-stat*	
Primary Variable												
NYSE$_t$	-0.0054	*-9.74*	***	-0.0029	*-6.72*	***	-0.0021	*-7.03*	***	0.0001	*0.30*	
Prior Quarter Control Variables												
LnMVE$_{t-1}$				0.0001	*0.32*		0.0000	*0.31*		-0.0001	*-1.12*	
Volume$_{t-1}$				0.0007	*0.50*		0.0011	*1.26*		0.0004	*0.74*	
Volatility$_{t-1}$				0.0430	*4.08*	***	0.0013	*0.16*		0.0197	*4.62*	***
LnNumAnalysts$_{t-1}$				-0.0004	*-1.20*		0.0000	*0.20*		-0.0003	*-2.62*	***
InstOwn$_{t-1}$				0.0025	*3.51*	***	0.0014	*2.83*	***	0.0008	*2.39*	**
Event Window Controls												
AbsEventRet$_t$				0.0567	*20.50*	***	0.0348	*16.49*	***	0.0122	*10.23*	***
MktHoursIndicator$_t$				0.0007	*1.67*	*	0.0007	*2.30*	**	0.0000	*0.24*	
I901_Indicator$_t$				0.0015	*4.07*	***	0.0012	*4.27*	***	0.0002	*0.99*	
I801_Indicator$_t$				0.0044	*8.70*	***	0.0020	*5.74*	***	0.0008	*3.89*	***
I701_Indicator$_t$				0.0028	*5.29*	***	0.0015	*4.04*	***	0.0005	*2.26*	**
I202_Indicator$_t$				0.0033	*6.83*	***	0.0017	*4.98*	***	0.0010	*4.46*	***
I101_Indicator$_t$				0.0036	*5.35*	***	0.0020	*4.02*	***	0.0000	*-0.02*	
Fixed Effects	*Time, Industry*			*Time, Industry*			*Time, Industry*			*Time, Industry*		
Psuedo R-Square	*0.033*			*0.131*			*0.116*			*0.142*		
Area under ROC	*0.674*			*0.809*			*0.799*			*0.845*		
N	*167,296*			*167,296*			*166,350*			*159,248*		

Table 5: Tests of H2a (firm-quarter sample)

This table provides details on the tests of H2a using the firm-quarter sample. Panel A provides descriptive statistics and univariate tests across the halt and no-halt samples (*Halt*). Tests of differences are based on two-sided ttests for means, Wilcoxon rank-sum tests for medians, and χ^2 tests for binary variables. Panel B provides multivariate logistic regressions of the halts (*Halt*) on variables that measure the underlying news content and direction, control variables, and time and industry fixed effects. Columns 1 and 2 include the full sample while Column 3 (Column 4) includes NYSE (NASDAQ) listed firms only. Time fixed effects use quarter-years and industry fixed effects use 2-digit SIC codes. Variable definitions provided in Appendix A. Regression marginal effects are calculated holding all other covariates at the sample mean. Regression standard errors are Huber/White robust estimators clustered by firm.

Panel A: Univariate statistics

	Halt=1 (n= 3,764)		*Halt=0* (n= 62,696)		Test of Difference (p-values)	
	Mean	Median	Mean	Median	Mean	Median
$AbsExtremeRet_t$	0.1868	0.1357	0.0925	0.0686	<0.01	<0.01
$AbsExtremeRet\_GoodNews_t$	0.1270	0.0741	0.0586	0.0393	<0.01	<0.01
$AbsExtremeRet\_BadNews_t$	0.0597	0.0000	0.0339	0.0000	<0.01	<0.01
$GoodNewsIndicator_t$	0.6312	1.0000	0.5971	1.0000		<0.01

Panel B: Logistic regressions

Dependent Variable: $Halt_t$	(1) Full Sample			(2) Full Sample			(3) NYSE			(4) NASDAQ		
	Margin	*z-stat*		Margin	*z-stat*		Margin	*z-stat*		Margin	*z-stat*	
Primary Variable(s)												
$AbsExtremeRet\_GoodNews_t$	0.2387	*12.87*	***				0.1047	*5.07*	***	0.3558	*12.17*	***
$AbsExtremeRet\_BadNews_t$	0.2837	*14.65*	***				0.1222	*5.88*	***	0.4211	*13.68*	***
$GoodNewsIndicator_t$				-0.0041	*-2.66*	***						
$AbsExtremeRet_t$				0.2502	*13.50*	***						
Prior Quarter Control Variables												
$LnMVE_{t-1}$	-0.0023	*-2.39*	**	-0.0023	*-2.34*	***	0.0025	*2.54*	**	-0.0042	*-2.46*	**
$Volume_{t-1}$	0.0287	*2.61*	***	0.0285	*2.58*	***	-0.0072	*-0.80*		0.0816	*3.92*	***
$Volatility_{t-1}$	-0.1673	*-1.37*		-0.1778	*-1.45*		0.1854	*1.38*		-0.3717	*-1.90*	*
$LnNumAnalysts_{t-1}$	-0.0112	*-6.88*	***	-0.0111	*-6.80*	***	-0.0073	*-4.97*	***	-0.0138	*-4.92*	***
$InstOwn_{t-1}$	0.0031	*0.79*		0.0035	*0.89*		-0.0008	*-0.22*		0.0072	*1.03*	
Current Quarter Control Variables												
$AbsRet_t$	-0.0004	*-0.09*		0.0018	*0.39*		0.0028	*0.50*		-0.0016	*-0.22*	
$LnNum8Ks_t$	0.0056	*3.49*	***	0.0057	*3.53*	***	0.0047	*3.27*	***	0.0038	*1.34*	
$MgmtFcst_t$	-0.0028	*-1.26*		-0.0029	*-1.26*		-0.0032	*-1.27*		-0.0026	*-0.76*	
Fixed Effects	*Time, Industry*			*Time, Industry*			*Time, Industry*			*Time, Industry*		
Psuedo R-Square	*0.126*			*0.125*			*0.100*			*0.115*		
Area under ROC	*0.764*			*0.763*			*0.746*			*0.753*		
N	*66,267*			*66,267*			*27,724*			*38,275*		
Test:		*ChiSq.*						*ChiSq.*			*ChiSq.*	
AbsExtremeRet_GoodNews= AbsExtremeRet_BadNews		*29.99*	***					*3.17*	*		*23.86*	***

Table 6: Tests of H2a (8-K sample)
This table provides details on the tests of H2a using the 8-K sample. Panel A provides descriptive statistics and univariate tests across the halt and no-halt samples (*Halt*). Tests of differences are based on two-sided ttests for means, Wilcoxon rank-sum tests for medians, and χ^2 tests for binary variables. Panel B provides multivariate logistic regressions of the halts (*Halt*) on variables that measure the underlying news content and direction, control variables, and time and industry fixed effects. Columns 1 and 2 include the full sample while Column 3 (Column 4) includes NYSE (NASDAQ) listed firms only. Time fixed effects use quarter-years and industry fixed effects use 2-digit SIC codes. Variable definitions provided in Appendix A. Regression marginal effects are calculated holding all other covariates at the sample mean. Regression standard errors are Huber/White robust estimators clustered by firm.

Panel A: Univariate statistics

	Halt=1 (n= 1,513)		*Halt=0* (n= 166,674)		Test of Difference (p-values)	
	Mean	Median	Mean	Median	Mean	Median
$AbsEventRet_t$	0.1065	0.0818	0.0373	0.0214	<0.01	<0.01
$AbsEventRet\_GoodNews_t$	0.0396	0.0000	0.0191	0.0008	<0.01	0.71
$AbsEventRet\_BadNews_t$	0.0668	0.0168	0.0182	0.0000	<0.01	<0.01
$EventGoodNewsIndicator_t$	0.4237	0.0000	0.5139	1.0000		<0.01

Panel B: Logistic regressions

Dependent Variable: $Halt_t$	(1) Full Sample		(2) Full Sample		(3) NYSE		(4) NASDAQ	
	Margin	*z-stat*	Margin	*z-stat*	Margin	*z-stat*	Margin	*z-stat*
Primary Variables								
AbsEventRet_GoodNews	0.0493	*17.16* ***			0.0209	*6.43* ***	0.0670	*15.88* ***
$AbsEventRet\_BadNews_t$	0.0665	*20.74* ***			0.0278	*8.07* ***	0.0907	*18.77* ***
$EventGoodNewsIndicator_t$			-0.0018	*-6.47* ***				
$AbsEventRet_t$			0.0584	*20.80* ***				
Prior Quarter Control Variables								
$LnMVE_{t-1}$	-0.0002	*-1.13*	-0.0002	*-1.12*	0.0000	*0.12*	0.0000	*0.03*
$Volume_{t-1}$	0.0008	*0.57*	0.0009	*0.59*	0.0004	*0.29*	0.0031	*1.51* **
$Volatility_{t-1}$	0.0381	*3.50* ***	0.0381	*3.55* ***	0.0266	*1.72* **	0.0459	*2.95* ***
$LnNumAnalysts_{t-1}$	-0.0004	*-1.12*	-0.0004	*-1.07*	-0.0008	*-2.46* ***	-0.0002	*-0.33*
$InstOwn_{t-1}$	0.0023	*3.19* ***	0.0023	*3.26* ***	0.0011	*1.39*	0.0031	*2.77* ***
Event Window Controls								
$MktHoursIndicator_t$	0.0007	*1.69* *	0.0007	*1.68* *	0.0028	*4.56* ***	-0.0007	*-1.30*
$I901\_Indicator_t$	0.0015	*4.10* ***	0.0015	*4.16* ***	0.0010	*2.65* ***	0.0018	*3.25* ***
$I801\_Indicator_t$	0.0046	*8.81* ***	0.0045	*8.84* ***	0.0019	*3.54* ***	0.0065	*8.11* ***
$I701\_Indicator_t$	0.0028	*5.17* ***	0.0027	*5.12* ***	0.0011	*2.40* **	0.0045	*4.85* ***
$I202\_Indicator_t$	0.0033	*6.66* ***	0.0032	*6.64* ***	0.0032	*5.42* ***	0.0033	*4.65* ***
$I101\_Indicator_t$	0.0039	*5.52* ***	0.0037	*5.42* ***	0.0001	*0.24*	0.0064	*5.78* ***
Fixed Effects	*Time, Industry*		*Time, Industry*		*Time, Industry*		*Time, Industry*	
Psuedo R-Square	*0.132*		*0.130*		*0.130*		*0.140*	
Area under ROC	*0.811*		*0.809*		*0.824*		*0.806*	
N	*167,296*		*167,296*		*66,878*		*96,555*	
Test:		*ChiSq.*				*ChiSq.*		*ChiSq.*
AbsExtremeRet_GoodNews= AbsExtremeRet_BadNews		*63.31* ***				*6.69* ***		*57.59* ***

Table 7: Tests of H2b (firm-quarter sample)

This table provides details on the tests of H2b using the firm-quarter sample. The dependent variable in Column (1) equals one for firm-quarters with a proactive halt while Column (2) equals one for firm-quarters with a reactive halts. All specifications provide multivariate logistic regressions of the respective halt variable on proxies for the underlying news content and direction, control variables, and time and industry fixed effects. Time fixed effects use quarter-years and industry fixed effects use 2-digit SIC codes. Variable definitions provided in Appendix A. Regression marginal effects are calculated holding all other covariates at the sample mean. Regression standard errors are Huber/White robust estimators clustered by firm.

Dependent Variable:	***Proactive_Halt*** $_t$		***Reactive_Halt*** $_t$	
	(1)		(2)	
	Margin	*z-stat*	Margin	*z-stat*
Primary Variable(s)				
AbsExtremeRet_GoodNews $_t$	0.1004	*7.05* ***	0.0391	*5.53* ***
AbsExtremeRet_BadNews $_t$	0.1361	*9.04* ***	0.0479	*6.44* ***
Prior Quarter Control Variables				
LnMVE $_{t-1}$	-0.0015	*-2.17* **	-0.0007	*-2.01* **
Volume $_{t-1}$	0.0244	*2.90* ***	0.0075	*1.77* *
Volatility $_{t-1}$	-0.0057	*-0.06*	0.2108	*4.62* ***
LnNumAnalysts $_{t-1}$	-0.0065	*-5.32* ***	-0.0055	*-8.47* ***
InstOwn $_{t-1}$	0.0031	*1.04*	0.0014	*0.84*
Current Quarter Control Variables				
AbsRet $_t$	-0.0076	*-2.01* **	-0.0042	*-2.34* **
LnNum8Ks $_t$	0.0023	*1.89* *	0.0001	*0.12*
MgmtFcst $_t$	-0.0022	*-1.26*	-0.0014	*-1.50*
Fixed Effects	*Time, Industry*		*Time, Industry*	
Psuedo/Adj. R-Square	*0.084*		*0.190*	
Area under ROC	*0.733*		*0.825*	
N	*65,278*		*64,991*	
Test:		*ChiSq.*		*ChiSq.*
AbsExtremeRet_GoodNews= AbsExtremeRet_BadNews		*32.67* ***		*7.13* ***

Table 8: Tests H2b interaction (8-K sample)

This table provides details on the tests of H2b using the 8-K sample. The dependent variable in Columns (1) equals one when the 8-K is associated with a proactive halts while Column (2) equals one when the 8-K is associated with a reactive halts. All specifications provide multivariate logistic regressions of the respective halt variable on proxies for the underlying news content and direction, control variables, and time and industry fixed effects. Time fixed effects use quarter-years and industry fixed effects use 2-digit SIC codes. Variable definitions provided in Appendix A. Regression marginal effects are calculated holding all other covariates at the sample mean. Regression standard errors are Huber/White robust estimators clustered by firm.

Dependent Variable:	***Proactive_Halt*** $_t$			***Reactive_Halt*** $_t$		
	(1)			(2)		
	Margin	*z-stat*		Margin	*z-stat*	
Primary Variables						
AbsEventRet_GoodNews $_t$	0.0299	*13.36*	***	0.0105	*8.65*	***
AbsEventRet_BadNews $_t$	0.0416	*17.00*	***	0.0136	*10.20*	***
Prior Quarter Control Variables						
LnMVE $_{t-1}$	-0.0002	*-1.32*		-0.0001	*-1.03*	
Volume $_{t-1}$	0.0013	*1.43*		0.0004	*0.70*	
Volatility $_{t-1}$	-0.0034	*-0.39*		0.0193	*4.52*	***
LnNumAnalysts $_{t-1}$	0.0001	*0.28*		-0.0003	*-2.66*	***
InstOwn $_{t-1}$	0.0013	*2.60*	***	0.0008	*2.42*	**
Event Window Controls						
MktHoursIndicator $_t$	0.0007	*2.25*	**	0.0001	*0.30*	
I901_Indicator $_t$	0.0012	*4.27*	***	0.0002	*1.01*	
I801_Indicator $_t$	0.0021	*5.87*	***	0.0008	*3.89*	***
I701_Indicator $_t$	0.0015	*3.88*	***	0.0005	*2.29*	**
I202_Indicator $_t$	0.0017	*4.81*	***	0.0010	*4.41*	***
I101_Indicator $_t$	0.0022	*4.19*	***	0.0000	*0.04*	
Fixed Effects	*Time, Industry*			*Time, Industry*		
Psuedo/Adj. R-Square	*0.116*			*0.144*		
Area under ROC	*0.800*			*0.846*		
N	*166,350*			*159,248*		
Test:		*ChiSq.*			*ChiSq.*	
AbsExtremeRet_GoodNews= AbsExtremeRet_BadNews		*51.49*	***		*11.76*	***