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Submitted electronically
Elizabeth M. Murphy, Secretary
Securities and Exchange Commission
100 F Street, NE
Washington, D.C. 20549-1090

Re: Proposed Amendments to Regulation SHO File Number S7-08-09;
   Proposed Price Test Amendments to Regulation SHO

Dear Ms. Murphy:

I appreciate the opportunity to comment on the Securities and Exchange Commission's proposals on short selling.

In the following paper, Joey Engelberg, Matt Ringgenberg and I provide evidence consistent with the idea that short sellers are no more likely to manipulate prices than any other type of trader. In our paper, we combine a database of short sellers' trading patterns with a database of news releases, and we show that the timing of short sales is the same as the timing of other types of trades. When we do find differences between the timing of short sellers' trades and the overall market, we find that short sellers trade *after* news stories. Our results show that short sellers are good at processing publicly available information, and as such, they call into question whether short sellers disproportionately engage in information-based manipulation strategies.

I hope this research helps the commission's rule-making process.

Sincerely,

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BUY ON THE RUMOR, [SHORT] SELL ON THE NEWS:
SHORT SELLERS, NEWS, AND INFORMATION PROCESSING[*]

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ABSTRACT

We combine a database of short sellers' trading patterns with a database of news releases to show that short sellers' trading advantage comes largely from their ability to analyze publicly available information. We show the venerable finding that short sellers' trades predict future negative returns (e.g., Boehmer, Jones, and Zhang (2008) and Asquith, Pathak and Ritter (2005)) is more than twice as strong in the presence of news stories. We also show that the ratio of short sales to total volume is nearly constant through news periods, and when we do find differences between the timing of short sellers' trades and the overall market, we find that relative to other types of trading there is a significant increase in short selling *after* news stories. We find that short sellers' ability to predict returns is concentrated in many of the same news categories in which short sellers trade relatively late; a finding consistent with the idea that the main source of short sellers' advantage is in their ability to process publicly available information. Our results show that short sellers are good at processing publicly available information, and as such, they call into question the Securities and Exchange Commission's recent efforts to eliminate short sellers' supposed information-based manipulation strategies by making short selling more difficult.

The financial crisis of 2008 has highlighted the importance of market participants' ability to process information. Investors and regulators have scrutinized financial statements, compensation agreements, complicated financial products, earnings announcements, and other macro and micro-economic news sources. These information processors contribute to the efficiency of prices by sorting through the vast amount of public data, identifying useful news items, and then trading on them. Accordingly, it has become increasingly important to understand how different market participants analyze and process information and how they trade in response to their analysis.

One group of investors has been accused of playing a unique role in the financial crisis; specifically, short sellers have been accused of exacerbating the financial crisis, instead of contributing to the efficiency of prices. The Securities and Exchange Commission suggested that short sellers had spread "false rumors" in efforts to manipulate firms that are "uniquely vulnerable to panic."[1] For this reason, regulators have made several attempts to stop those who would hijack the efficient price-setting process. The June 2008 Emergency Order and the September 2008 Short Selling Ban were two measures implemented by the Securities and Exchange Commission to eliminate short sellers' supposed information-based manipulation strategies. Although the wisdom of these measures is still being debated, their existence highlights the importance of understanding short sellers' relationship to information.

This paper examines how short-sellers trade in the presence of information. We do so by focusing on news events in which private information becomes public information for investors to digest. This paper is the first to join a database of public news events (the Dow Jones archive

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[1] "What the SEC Really Did on Short Selling" by Christopher Cox, 24 July 2008, The Wall Street Journal.

as in Tetlock (2009)) with a database of all short-sale trades in order to use the trading behavior of short-sellers to evaluate their information processing skills.

There are two views regarding the relation between public news, like the Dow Jones archive, and the trading of skilled investors. Under the first view, public information does not provide traders with information advantages. For example, Kacperczyk and Seru (2007) identify skill based on how much a fund manager "relies on publicly available information." Under their view, managers who rely on public information (rather than generate private information) are low-skilled. Kacperczyk and Seru estimate the reliance on public information (RPI) as the R^2 of a regression of the percentage changes in fund managers' portfolio holdings on changes in analysts' past recommendations. They find that fund managers with low RPIs perform better than fund managers with high RPIs.

The alternative view is that public information events ("news") present trading opportunities for skilled information processors. Under this view, there is large cross-sectional variation in the information processing skills of investors. When news is released, those with superior information processing skills can convert this news into valuable information which they can then use to make trades. For example, earnings announcements are often accompanied by lengthy documents and conference calls which are scrutinized by information producers. Those who are best at processing these data into value-relevant information will be rewarded with superior returns on event-driven trades.[2] Under this view news is fodder for information producers, and it provides them an opportunity to make profitable trades. Evidence for this view comes from studies that attempt to process the "soft," textual content of news and firm

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[2] One example of event-driven information traders are hedge funds. For example, hedge funds that specialize in merger-arbitrage are, presumably, superior processors of information at or after merger announcements and take positions accordingly.

announcements. Tetlock et al. (2008), Engelberg (2008), Demers and Vega (2008), and Feldman et al. (2009) all show that the textual content of news and firm announcements predicts returns, which is consistent with the view that well-processed information can generate superior returns for skilled information processors.

In our analysis, we first ask whether short-sellers process public information at all. For example, we might imagine that short-sellers already have the private information before it becomes public news. In other words, short sellers may anticipate rather than process public news. To address this issue, we examine the universe of news events and look for abnormal short-selling ahead of news events, which is evidence of anticipation. We find none. In fact, we find that the ratio of short sales to total volume is nearly constant through news periods, and when we do find differences between the timing of short sellers' trades and the overall market, we find that relative to other types of trading there is a significant increase in short selling *after* the news story. This finding indicates that short sellers, on average, trade on publicly available information as opposed to uncovering information before it becomes public.

Given this finding, we next ask whether short sellers process the public news well. Several papers have found that abnormal short-selling or high short-interest unconditionally predicts lower future returns (Asquith and Meulbroek (1995), Senchack and Starks (1993), and Aitken, et al. (1998)). We confirm these results and find that abnormal short-selling does lead to lower future returns, but that this effect is largely concentrated around news events. We show that short selling's predicative effect on future returns is more than twice as strong in the presence of news stories. In other words, a short seller's most informative trades are in response to newly released public news which is consistent with the interpretation that short sellers are good information processors.

Finally, we investigate whether short-sellers are particularly good at processing specific kinds of information. We use the news subject classification in the Dow Jones archive to sort stories into various categories ranging from analyst comments to earnings announcements to new debt issues. We find that the most informative trades of short-sellers are concentrated in six categories: *Divestitures or Asset Sales*, *Earnings*, *Earnings Projections*, *Management Issues*, *New Products & Services,* and *Stock Ownership*. Furthermore, we find that many of these categories are the categories in which short sellers' trades are measurably later than other trades, a finding consistent with the idea that the main source of short sellers' advantage is the ability to process publicly available information as opposed to their ability to trade quickly or uncover information before it becomes publicly available.

In sum, the evidence herein supports the notion that, although their skill varies depending on the type of news story, short-sellers are superior processors of news. The trades they execute which are most informative for future returns are those trades that follow news announcements. Given the high demand for information processing during the financial crisis, our findings call into question the move to restrict short sellers at a time when their information processing skills may be most valuable.

The remainder of this paper proceeds as follows. Section I discusses the existing literature relative to the contributions of this paper. Section II describes the databases used in this study and section III discusses the analyses and findings. Section IV concludes.

I.   Background

The ideas in this paper touch two distinct branches of the existing literature. First, there is an extensive literature on the behavior of short sellers relative to other traders. Second, there is a growing literature on how market participants respond to public news.

Several papers look at short selling behavior in the context of a single type of corporate event, and as such, share a piece of this papers' investigation. Karpoff and Lou (2009) examine short sellers' positions in firms that are investigated for financial misconduct and they find that short sellers generally anticipate public announcements of investigations. Similarly, Christophe, Ferri, and Angel (2004) carefully investigate how short sellers trade around earnings announcements, and they find that, on average, short sellers do not trade before earnings announcements. Similarly Daske, Richardson, and Tuma (2005) look at short selling around earnings announcements and management forecast announcements and they find no evidence that short sale transactions are concentrated prior to bad news events. Nagel (2005) shows that cash flow news implied by a vector auto regression has an asymmetric effect on returns, indicating that short sellers help incorporate news into prices when short selling is not constrained. Finally, Edwards and Hanley (2008) show that short selling is prevalent in early IPO trading, casting doubts on short sale constraints as an explanation for IPO pricing anomalies. These papers identify distinct patterns in short selling around specific corporate events, so the question is: are there any common themes in short sellers' trades around news events in general, and how do these themes relate to wider patterns in short sellers' behavior?

A. Short Sellers' Trading Patterns

Several papers compare the trades of short sellers to other market participants. There are several dimensions over which to compare trades, and much of the recent literature has been focused on the profitability of trades, which can be measured, loosely, with stock price performance after the short sale. One of the most widely cited results in this vein of inquiry is found in Asquith and Muelbroek (1995), which shows high short interest precedes negative future returns. Similarly, Asquith, Pathak, and Ritter (2005) show that when short selling is constrained and there are relatively diverse opinions, then, in some cases, abnormally high short interest precedes negative future returns. Using transaction data at a higher frequency, Boehmer, Jones, and Zhang (2008) show that heavily shorted stocks significantly underperform lightly shorted stocks, indicating that short sellers may have an information advantage. Using a similar approach, Diether, Lee, and Werner (2008) show that not only do prices follow short selling, but short selling also follows prices. Specifically, the paper shows that short sellers tend to short after price run ups.

Another, closely related dimension of short sellers trading is whether the short sellers' trades reveal information to other market participants. In other words, are short sellers' trades news worthy in and of themselves? Senchack and Starks (1993) show that abnormally large short interest announcements have small, but significant negative returns. Similarly, Aitken, et al. (1998) show that short sales are followed by price declines within 15 minutes on the Australian Stock Exchange.

B. News and Information

Although there is a large literature that examines volume and return phenomenon around *specific* events (e.g. earnings announcements, mergers and dividend initiations and omissions), more recently a literature has emerged that has considered such phenomena around *any* news event. Antweiler and Frank (2006) categorize all Wall Street Journal stories between 1973 and 2001. They find large differences in return responses depending on the news category, although they find evidence of overreaction (return reversal) on average. Tetlock (2008) finds evidence of even stronger return reversal following repeated news events consistent with the idea that investors overreact to "stale" news stories. Tetlock (2009) argues that several features of return and volume dynamics around news events are evidence that public news resolves information asymmetry between investors. Several studies have also taken well-known asset pricing anomalies and examined whether they are related to news. Chan (2003) considers the momentum anomaly among stocks with and without recent news and finds evidence of price momentum only among news stocks. Vega (2006) finds more earnings momentum among stocks with high differences of opinion on news days.

More recently, studies have found the textual content of news stories contains value-relevant information. Tetlock, Saar-Tsechansky, and Macskassy (2008) and Engelberg (2008) shows that the qualitative content of the textual information in news stories can predict both firm earnings surprises and short-term returns. These studies support the idea that there exist value-relevant, "soft" information in news stories that is not immediately impounded into prices.

II. Data

The data used in this study comes from the intersection of two databases. The first database contains information on short sales transactions while the second database contains statistics on news articles from the Dow Jones News Service.

A. Short Sales

Information on short sales transactions is obtained from the NYSE TAQ Regulation SHO database. Regulation SHO was adopted by the SEC in June of 2004 in order to establish new rules governing short sales in all equity transactions and to evaluate the effectiveness of price test restrictions on short sales. As one consequence of regulation SHO, short sale data at the transaction-level was publicly disclosed for the period January 3, 2005 through July 6, 2007. Accordingly, the NYSE TAQ regulation SHO database contains data for all short transactions that were reported on the NYSE during this period. Specifically, the database contains the stock ticker, the date and time of the transaction, the number of shares that were traded, the execution price, and an indicator that denotes whether or not the transaction was exempt from the tick test rule in accordance with regulation SHO.

For the purposes of our analysis, we aggregate the transaction data to the daily level, and we use the TAQ master files to add CUSIPs to the database. We then use the *CRSP Daily Stock Event - Name History* file to add PERMNOs to the database. Finally, we add returns, total volume, and shares outstanding from CRSP.

B. Dow Jones Archive

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For our database of news events we use the Dow Jones archive as in Tetlock (2009). The archive contains all Dow Jones News Service stories and Wall Street Journal stories over our time period of 2005 - 2007. One of the challenges inherent in examining firm specific news articles is that an article may contain references to more than one company. However, in the normal course of its business, Dow Jones employs proprietary algorithms in order to identify the firms that are the main subject of an article.

We adopt these Dow Jones categorizations instead of attempting to categorize the information in the articles ourselves. While some studies have attempted to categorize the information in news articles on their own, we feel that adopting the Dow Jones categorizations provides several advantages. First, the Dow Jones categorizations represent an objective measure that cannot be influenced by the authors of this study. Moreover, these objective categorizations allow the results of this study to be replicated using publicly available data.

In addition to the information discussed above, the Dow Jones database contains subject codes that identify the topic of each article. For example, there is a code to indicate that an article contains information about insider stocks sales. However, many of the subject codes do not relate to financial information or specific companies. Thus, we focus only on those subject codes which directly relate to firm specific financial news and the resulting list of subject codes contains 71 different news categories. Several of these 71 subject codes are general codes that do not provide valuable information about the content of a news article. For example, nearly every article in the database has the code *company news* assigned to it, in addition to a more

specific news code. Thus, we remove these general codes and our final list of subject codes contains 47 different news categories.[3]

The resulting database contains a unique firm identifier, a relevance score, subject codes, a sentiment code that measures whether a story is positive, negative, or neutral, and an indicator variables that takes the value unity if a story was released in multiple pieces over the news day. We use the unique firm identifier to match the news data to the short sales database and the resulting database has 1,888,868 observations over the period January 3, 2005 to July 6, 2007. Table I contains summary statistics for the combined database. The mean number of articles per firm-day is 1.10, however, there is substantial cross-sectional variation in this number and larger firms typically have more news articles on a given day. Moreover, certain news categories appear much more often than others. For example, the category *High Yield Issuers* appear 173,357 times in the database while *PRN Corporate Disclosure* appears only 24 times.

III. Results

In this section we describe our approach to answering the key questions of how short sellers' differ from other traders. We begin by asking whether short sellers respond to news more or less quickly than other market participants. Next, we ask whether short seller's trades are more profitable than other trades, and whether the advantage short sellers may have is related to their ability to analyze news.

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[3] We analyze the correlation between subject codes and we exclude subject codes if they are highly correlated with a more specific news category. We define highly correlated as those subject codes that have correlations in excess of 80%.

One way in which short sellers may differ from other traders is in the timing of their trades. Several papers show that short sellers respond to news, and there is some evidence that short sellers anticipate bad news announcements (e.g., Angel, Ferri and Christophe (2004) and Karpoff and Lou (2009)). However, these findings are in the context of specific types of corporate events, and there is no evidence that short sellers have the ability to anticipate news in general.

Our first empirical investigation into the timing of short sales around all news events is presented in Figure 1. The solid line plots daily short sales volume in calendar time around news events, while the dashed line plots total volume. The dotted line shows the ratio. The basic result is readily apparent; short sellers trade when other traders do. Clearly, all traders respond to news; there is a significant increase in volume on the news event day and the surrounding days. However, the ratio of short sales to total volume is nearly constant through the news period, and there is no significant change in the ratio around news events.

Of course, it may be the case that short sellers respond more to certain types of news, particularly, bad news. In Panels B and C of Figure 1, we split news events into positive news and negative news, where positive (negative) news events are defined using the ratio of positive (negative) words to total words in a headline and those articles that are in the top quintile of each ratio are considered to be positive (negative). The results are largely similar indicating that the timing of short sellers' response to news does not depend on whether the news is good or bad.

We take a significantly different approach to uncover whether the timing of short sellers' responses vary by news category. Table II presents results from a regression of short sales volume on a set of indicator variables representing stories in each of the news categories.

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Specifically, we regress daily aggregate short volume on a set of indicator variables that take the value one if there is a news story in a particular news category on a given day and zero otherwise. To control for the documented response of short sellers to past returns, as in Diether, Lee & Werner (2008), we include two lags of daily returns.

The results indicate that for the majority of news events, short sellers respond at the same times as other traders. Specifically, for a given news event, when we compare the coefficient estimates for regressions on short selling *after* the news event to those estimates on short selling *before* the news event, we find that the coefficient estimates are largely the same. However, there are a number of interesting exceptions. For the earnings news stories, *Earnings* and *Earnings Projections by Companies / Analysts*, there is more short selling after the news event than before the news event, a result largely consistent with the findings of Angel, Ferri, and Christophe (2004). The statistically significant coefficient estimates in the *t+1* specification indicate that there is significantly more short selling one day after news stories about earnings relative to other days. The statistically significant estimate of 0.0035 in the *t+1* specification for *Earnings Projections by Companies / Analysts* indicates that there is a 0.35% increase in short selling as a percentage of total volume one day after this type of news story.

Interestingly, this late response is also apparent in news stories about joint ventures and stock ownership, however stories about leveraged buyouts show the opposite pattern. The coefficient estimate of 0.0166 in the *t-1* specification indicates that the short selling ratio increases by 1.66% on the day before news stories about leveraged buyouts. Furthermore, the statistically significant coefficient estimate on *Future Minus Past* indicates that, relative to the two-day period before the news event, the short selling ratio decreases by 2.33% in the two-day period after the news event. Table III shows results from an identical setup, but one in which the

dependent variable is raw daily short sales volume (i.e., not scaled by total volume). These results can be interpreted as a direct measure of the average increase in the number of shares traded as the result of news events. The results are qualitatively similar, but the interpretation is more direct. For instance, in the most extreme case, we see that on the day of news stories regarding Corporate Disclosure, we see a statistically significant increase in the number of shares sold short, and the estimate indicates that there were 412,174 additional shares shorted on the day of the average story on Corporate Disclosure. Despite the natural interpretation, these results are not as meaningful as the scaled results previously discussed; over this time period there is a strong market-wide trend towards increasing short volume and as a result, *Future Minus Past* is statistically significant in around half of the news categories.

B. Short Selling Around News Events and Future Returns

The previous section shows that short sellers generally trade at the same times as everyone else, and in the few situations in which short sellers show different timing, short sellers tend to trade after other traders. But up to this point, we have not explored whether those trades differ from other trades in another dimension: profitability. Previous research shows that short sellers can be informed (e.g., Boehmer, Jones, and Zhang (2008) and Asquith, Pathak and Ritter (2005)), and the goal of this set of experiments is to determine whether their advantage derives from an ability to process the information contained in public news events.

B.1. Short Sellers' Advantage and News

To answer this question as directly as possible, we begin by replicating Table IV of Boehmer, Jones, and Zhang (2008), shown in Table IV below. Specifically, we compute 20-day rolling returns from January 3, 2005 through July 6, 2007 and we regress these returns on the *Short Volume Ratio*, which is defined as daily short volume divided by total volume. The Boehmer, Jones, and Zhang (2008) result comes through strongly in these results; in all of the specifications, *Short Volume Ratio* is negative and statistically significant, indicating that when there are a lot of short sales, future prices decrease. But, given the previous results, we might expect this pattern to be stronger among firms for which news is released when short volume is high. To gauge this potential effect, we include an indicator variable, *News Event*, which takes the value one if there is news in any of our previously discussed categories on the day of the short volume measurement and zero otherwise. We also include contemporaneous returns as a control for the information content in news.

The results in Table IV are striking. The coefficient estimate of -0.0061 on *Short-News Interaction* in Model 4 is negative, relatively large and statistically significant, indicating that among stocks with high short volume, those with news have significantly more negative future returns than those without news. Even after controlling for the contemporaneous effect of returns in Model 4, the coefficient on *Short Volume Ratio* is still negative at the 10% significance level. In other words, the Boehmer, Jones, and Zhang (2008) finding that short volume leads negative returns still holds. Thus, our findings suggest that the documented relationship between

short volume and returns is more than twice as strong for stocks with news than stocks without news.[4]

B.2. Price Responses by Category

It is natural to be interested in whether this result is uniformly strong across news categories, and to get at this question, we perform a similar experiment independently for each category of news. Specifically, we run a regression in which the dependent variable is the cumulative return from the first to the thirtieth trading day after the news event. The main independent variable is *short vol / market vol* which is the amount of short selling, relative to total volume, on the day of the news event. Since whether the news is good or bad may have some effect on the future return (e.g., Bernard & Thomas (1989)), we attempt to control for the content of the news by including the news-event day return on the right hand side of the specification.

The results, shown in Table V, indicate that short sellers have some ability to identify trades which are likely to be profitable around certain news events. The statistically significant coefficient estimates on *short vol / market vol* are generally negative; among the four estimates significant at the 1% significance level, all four are negative, and among the six estimates significant at the 5% significance level, all six are negative. Furthermore, most of the

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[4] The Boehmer, Jones, and Zhang (2008) result can be thought of as a high-frequency analog to the results in Asquith and Muelbroek (1996) and Asquith, Pathak, and Ritter (2005). This second set of papers measures short trading with short interest instead of short volume and they use future returns that are measured over longer periods. Although we would like to examine the relationship between news and short sellers' advantage in the context of these short-interest-based findings, there is an econometric challenge with the direct comparison. Specifically, news in our database is marked with daily time stamps, so we would need to either aggregate news to match the monthly frequency of short interest or throw out much of the news data. Future research will address this challenge. It is not clear how this reduction in the frequency of the news variable would change expectations about the short positions.

statistically significant categories are the same categories identified in the previous section, which is largely independent; the news categories *Earnings* and *Earnings Projections by Companies / Analysts, and Stock Ownership* are three of the news categories in which short sellers' trade timing differs from that of the overall market. These results indicate that when the presence of short selling does predict future returns, short sellers seem to be making profitable trades.

B.2. Matched Sample Portfolio Approach

Thus far we have provided evidence that short-selling is more informative on days in which there was a news event. However, the careful reader may be concerned about two components of our analyses. First, our analyses do not consider the subject of the news and therefore our results may be driven by a particular news event (e.g. earnings) which appears more frequently in the news archive. Second, news coverage is not random and is, in fact, strongly related to several firm characteristics like size and institutional ownership (Chan (2003), Vega (2006), Engelberg (2008), and Fang and Peress (2009)). Moreover, news coverage is highly persistent: firms that have many news articles in the Dow Jones archive in one year are likely to have many articles in following year. In order to conclude that news, rather than a particular firm characteristic, is driving the differential returns we observe we would like to compare two otherwise identical firms where the first firm has a news event and the second firm does not. We address both concerns in what follows.

Our approach is based on forming portfolios of stocks around news events. In this experiment, we first acknowledge previous research that indicates increases in volume and

increases in short selling both have effects on future returns, (e.g., Boehmer, Jones, and Zhang (2008) and Gervais, Kaniel, and Mingelgrin (2001)) and to control for these previously documented effects, we carefully implement a control sample methodology. Specifically, for every stock with a news event, we identify a control stock that is the closest match in the following three dimensions: size, institutional ownership, and the number of news events over the past month. We match by selecting the stock that minimizes the sum of rank differences in each of these categories. Furthermore, to eliminate potentially contaminating competitive effects (e.g., Slovin, Sushka, and Bendeck (1991), Chen, Ho, and Ik (2005) and Hsu, Reed, and Rocholl (2009)), we force control firms and sample firms to be members of different Fama-French 48 industries.

The analysis yields results for each of the 47 news categories. As an example, the results for three of the categories are presented in Figure 2. In the *Earnings* category, we see that among firms with earnings news, those firms with high short volume have significantly lower returns than those with low short volume. This difference, approximately 6% at the one year point, is in stark contrast to the control sample in which the opposite is true; high short volume stocks have higher returns than their low short volume counterparts. In other words, the previous documented finding in the literature that short selling predicts low future returns is a result that comes from conditioning on short volume alone. As a result, the previous literature misses the striking result that short sales only have the ability to predict future negative returns around news events; at other times, short selling is actually an indication of positive future returns.

These results are also summarized in Table VI, and the economic significance of the results becomes apparent when comparing the difference in portfolio returns. For example, if an investor were to buy a portfolio of stocks with abnormally high short selling and sell a portfolio

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of stocks with low short selling on the day earnings news was released, that investor would earn a 5.82% annual return. Furthermore, a matched portfolio of no-news stocks would return −2.07% over the same period, yielding a difference of −7.89% annually between the two strategies. In fact, the strategy yields positive excess returns in 37 out of 47 news categories, with some news categories yielding annualized excess returns of over 10%. The statistically significant -4.27% mean return for the average of excess return differences indicates that short sellers have a significant advantage in the presence of news. Accordingly, the characteristic-matched portfolios indicate that the advantage short sellers have over other traders comes largely from their ability to trade around news events.

IV. Conclusion

This paper examines how well short-sellers process information. We combine a database of all public news events with a database of short-sale trades to answer a few basic questions, such as: To what extent are short sellers able to anticipate news events? Are there any categories of news that short sellers are particularly good at anticipating? How much of short sellers' informational advantage is related to their ability to react to news?

We find that, in general, short sellers trade when everyone else does. That is, the ratio of short sales to total volume is nearly constant through news periods, and there is no significant change in the ratio around news events. On the other hand, we do find some differences between the timing of short sellers' trades and the overall market. We find that for certain news stories about earnings, joint ventures, and stock ownership, relative to other types of trading there is a significant increase in short selling *after* the news story. This finding is consistent with the idea

that the trading advantage possessed by short sellers arises from their analysis of publicly available information and not from uncovering information before it becomes public.

But there is another dimension of trading on which short sellers have been shown to be different from other traders: profitability. Previous research shows that short sellers are informed (e.g., Boehmer, Jones, and Zhang (2008) and Asquith, Pathak and Ritter (2005)), and in this paper, we ask whether their advantage derives from an ability to process information in news.

In a striking set of results, we show that, overall, short sellers' informational advantage derives primarily from their ability to process news. We start by showing that the short selling predicts future returns in an overall context; after controlling for the Boehmer, Jones, and Zhang (2008) effect, we show that short selling's predicative effect on future returns is more than twice as strong in the presence of news stories. Next, we show that the predicative effect is strongest among certain categories of news, many of which are the same categories in which short sellers' trade timing differs from that of the overall market. Finally, recognizing that the presence of news is likely correlated with size and that each category of news may be more relevant for some firms more than others, we construct an experiment in which each firm's response to a news event is matched by a control firm's response on the same day. In this experiment, we find that short sellers' advantage in predicting returns is concentrated in firms with news, across all news categories.

Overall, we show that short sellers have a superior ability to process news. We show that, on average, short sellers' advantage is not found in their ability to influence the public's perception of value as recently suggested by the Securities and Exchange Commission.[5] Rather,

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[5] Short sellers were accused of "Distort and Short" schemes in "What the SEC Really Did on Short Selling" by Christopher Cox, 24 July 2008, The Wall Street Journal.

we find that short sellers generally trade when other traders do, and to the extent that they differ, short sellers actually trade *after* other traders. Furthermore, the venerable result that short sellers' trades predict future negative returns turns out to be concentrated around news events. In other words, by connecting short sellers' trading patterns with a database of news releases we conclusively show that short sellers' trading advantage comes from their ability to analyze publicly available information.

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Figure 1
Volume around News Events

Figure 1 displays short volume, total volume, and the ratio of short volume to total volume for the 15 days before and after news events. Short volume and total volume are scaled by their mean values over the period -16 to -30. Panel A displays volume around all news events, Panel B displays volume for *positive* news events only, and Panel C displays volume for *negative* news events only. Positive (negative) news events are defined using the ratio of positive (negative) words to total words in a headline and articles in the top quintile of each ratio are considered to be positive (negative).

Panel A: All News Events
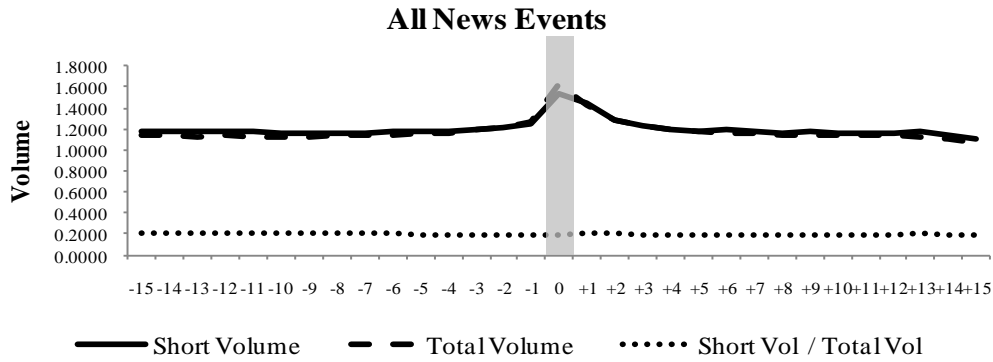
All News Events

Panel B: Positive News Events

Positive News Events
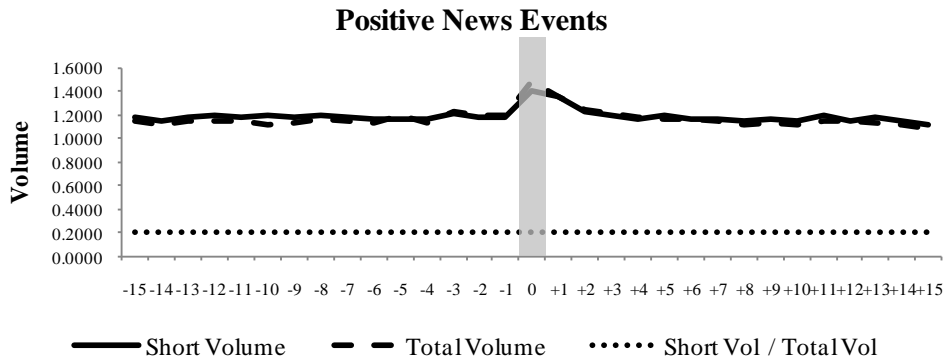
Panel C: Negative News Events

Negative News Events
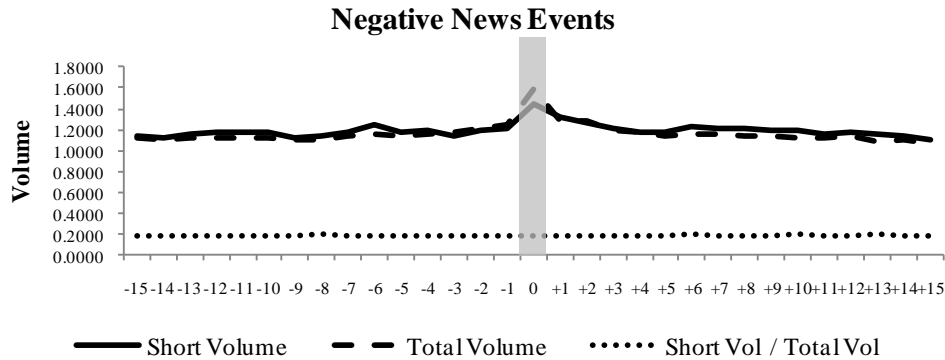
Figure 2
Example Short Volume Portfolio Returns following News Events

Figure 2 displays buy and hold portfolio returns for a 12 months period following news events. Each day for each news event, two portfolios are formed: the first portfolio consists of those firms that had a specific news event and had low short volume as a percentage of total volume; the second portfolio consists of those that had the news event and had high short volume as a percentage of total volume. In addition, we form control portfolios using a sample of firms that did not experience the news event but were similar in terms of market capitalization, institutional ownership, and the number of news events over the previous month. Three examples are shown below. Panel A contains portfolio results following dividend news and the results for the matched control sample. Similarly, Panel B contain portfolio results following earnings news and the associated control results. Panel C contains results following news about insider stock sales and the associated control results.

Panel A: Dividends
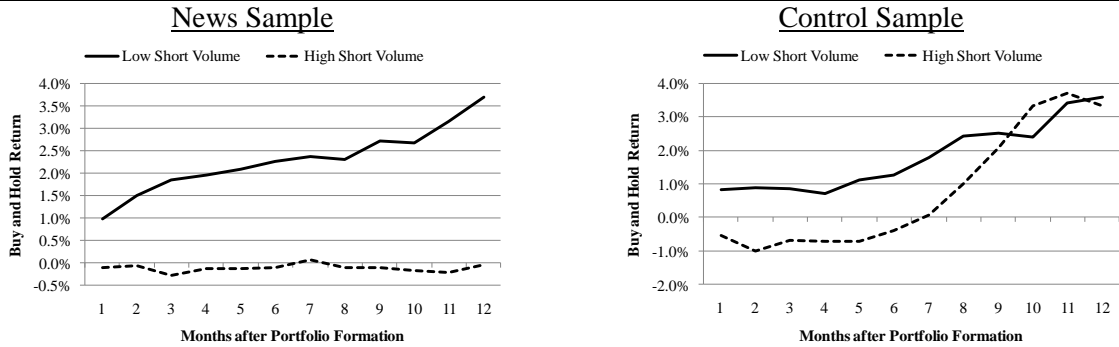
Panel B: Earnings
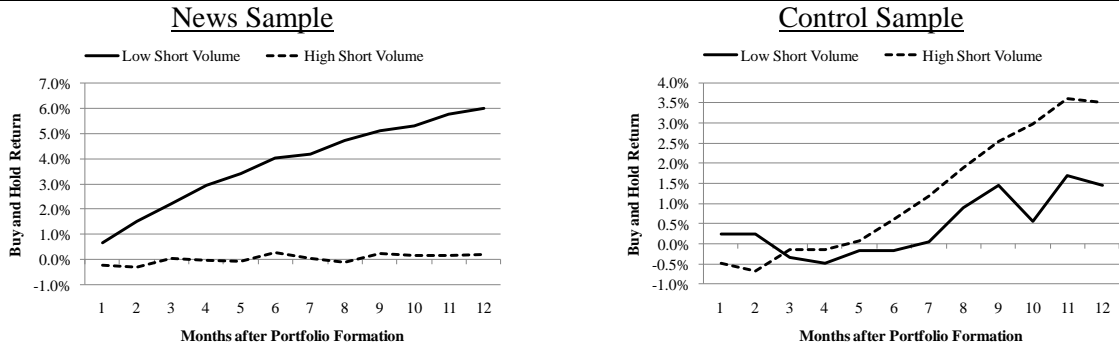
Panel C: Insider Stock Sales

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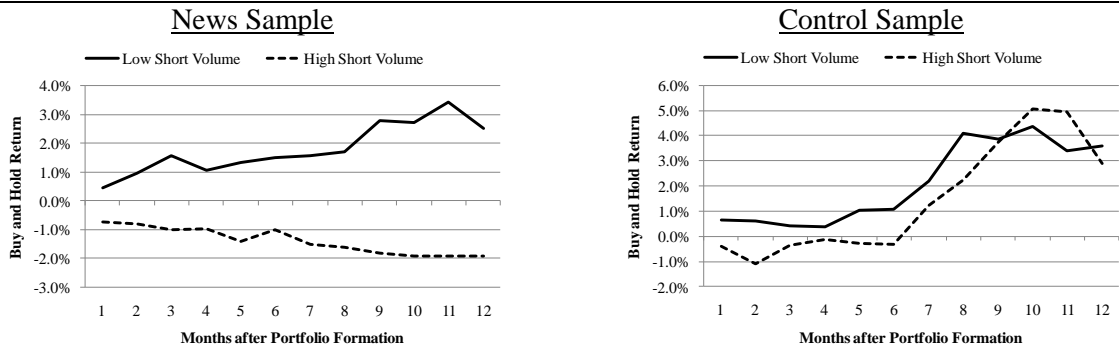
Table I
Summary Statistics

The database has 1,888,868 observations over the period January 3, 2005 through July 6, 2007. Short sale volume data is from the NYSE TAQ Regulation SHO database. Panel A provides summary statistics at the firm level, while Panel B provides an overview of how often certain news categories appear in the data. Articles may be classified into more than one category. In addition, news articles may be reissued throughout the day as more information becomes available; in such situations we consider all of the related article updates to be one unique news event, however we keep track of the number of articles that are rolled-into this unique news event. Accordingly, *News Articles per Firm-Day* is a count of all news articles including reissued (updated) articles, while *Unique News Events per Firm-Day* is a count of the unique stories, excluding subsequent updates to an article. The *Positive* (*Negative*) *Body Text* and *Headlines* numbers represent a count of the number of article with positive (negative) body text or headlines. Positive (negative) text and headlines are defined using the ratio of positive (negative) words to total words in an article or headline and the top quintile of each ratio is then counted in order to arrive at the number of positive (negative) text or headlines.

Panel A – Firm Level Statistics	Mean	Median	1st Percentile	99th Percentile	Standard Deviation
News Articles per Firm-Day	1.10	0.00	0.00	18.00	4.09
Unique News Events per Firm-Day	0.81	0.00	0.00	12.00	2.77
Short Sale Volume per Firm-Day	131,695	27,100	100	1,522,400	347,464
Market Capitalization ($ mm)	$5,939	$1,274	$32.6	$81,364	$19,609

Panel B – News Categories	N	Positive Body Text	Negative Body Text	Positive Headlines	Negative Headlines
10K	1,320	239	364	185	256
8K	10,803	3,650	2,054	2,685	1,251
Acquisitions, Mergers, Takeovers	56,993	18,852	13,335	12,664	5,386
Analysts' Comments & Ratings	49,508	8,870	13,139	8,775	8,003
Annual Meetings	4,041	1,371	998	1,109	647
Antitrust News	5,217	1,205	2,666	1,137	1,143
Bankruptcy-Related Filings	6,258	1,290	3,554	915	1,271
Bond Ratings & Comments	15,343	5,045	6,696	3,075	3,138
Buybacks	6,269	2,521	1,469	1,724	486
Contracts, Defense	4,734	1,203	1,559	1,470	749
Contracts, Government (not defense)	3,321	734	1,008	603	460
Contracts, Nongovernment	19,102	5,345	5,336	3,887	2,477
Corporate Governance	4,981	1,493	2,022	1,068	774
Corporate Restructurings	5,631	995	2,395	739	630
Divestitures or Asset Sales	11,587	2,384	2,768	2,038	818
Dividend News	24,731	8,606	4,404	4,314	7,532
Earnings	40,705	7,901	8,878	4,885	4,082

Table I (continued)

Panel B – News Categories	N	Positive Body Text	Negative Body Text	Positive Headlines	Negative Headlines
Earnings Projections	37,432	7,073	9,267	4,801	3,246
Financing Agreements	6,919	2,311	1,736	2,215	732
Front Page Stories	1,947	234	1,289	234	328
High-Yield Issuers	173,357	34,921	41,693	29,027	28,834
Initial Public Offerings	9,351	2,115	2,014	1,446	655
Insider Stock Buys	21,489	1,536	1,373	5,868	872
Insider Stock Sells	54,868	3,603	3,827	7,075	2,015
Joint Ventures	9,081	2,109	2,439	1,739	886
Labor Issues	12,376	1,938	5,889	1,640	2,112
Lawsuits	15,351	2,906	8,562	3,180	2,926
Leveraged Buyouts	2,286	632	877	511	270
Liquidation	229	76	116	24	50
Management Issues	13,840	3,933	4,365	2,949	1,638
Market News	14,068	1,874	5,717	1,901	1,872
Money Market News	1,298	145	762	125	159
New Products & Services	24,583	7,822	7,833	4,658	4,235
Personnel Appointments	29,994	8,377	7,799	5,208	4,261
Point of View	17,316	3,151	7,773	2,742	2,504
PRN Corporate Disclosure	24	0	9	1	1
Product Distribution	2,440	513	817	376	219
Research & Development	5,323	976	2,321	803	833
Shareholder Rights Plans	531	253	182	179	77
Shelf Registrations	524	236	73	87	178
Short Interest Sales	136	53	88	38	47
Spinoffs	1,874	684	384	195	84
SPOT	134,546	34,219	34,026	25,725	15,737
Stock Options	5,679	1,342	1,886	977	739
Stock Ownership	25,567	3,633	4,098	5,059	2,198
Stock Splits	2,230	463	302	142	283
TAP	133,063	46,911	27,249	28,480	26,452

Table II
Regression Analysis of Short Volume Ratio around News Events

Table IIa contains the results of six regressions of short sales volume on a set of indicator variables representing stories in each of the news categories. Specifically, the dependent variable is aggregate short volume as a percentage of total volume and the independent variables are indicator variables that take the value one if there is a news story in a particular news category and zero otherwise. We vary the timing of the dependent variable relative to the news event in order to examine short volume changes around news. For example, *t-2* indicates that the dependent variable is observed two days prior to the news event. *Future Minus Past* indicates that the dependent variable is the difference in the short volume ratio between dates *t+2* and *t-2*. To control for the documented response of short sellers to past returns, we include two lags of daily returns. *** indicates significance at the 1% level, ** indicates significance at the 5% level, and * indicates significance at the 10% level.

News Events	Event Time of the Dependent Variable					Future Minus Past
	t-2	*t-1*	*t=0*	*t+1*	*t+2*	
Mean of the fixed effects	0.1812***	0.1857***	0.1850***	0.1832***	0.1883***	-0.0102
Return (1 day lag)	0.3756***	0.3761***	0.3689***	0.3653***	0.3710***	0.5749***
Return (2 day lag)	0.2654***	0.2692***	0.2670***	0.2620***	0.2573***	-0.4506***
Analysts' Comments & Ratings	0.0023	0.0036**	0.0135***	0.0067***	0.0067***	0.0078**
Buybacks	-0.0038	-0.0049**	-0.0011	-0.0037*	-0.0028	0.0018
Bankruptcy-Related Filings	0.0062	0.0032	0.0010	-0.0016	0.0003	-0.0124
Corporate Governance	-0.0018	-0.0017	-0.0004	-0.0007	0.0006	0.0037
Contracts, Nongovernment	0.0009	0.0028	-0.0006	0.0009	0.0001	-0.0024
Contracts, Defense	-0.0018	-0.0030	0.0088	0.0032	0.0012	0.0092
Dividend News	0.0007	-0.0034***	-0.0003	0.0004	0.0003	0.0048*
Divestitures or Asset Sales	-0.0002	-0.0003	0.0004	-0.0011	0.0010	0.0005
Earnings	-0.0002	-0.0022*	-0.0023	0.0035***	0.0055***	0.0132***
Earnings Projections	-0.0035*	0.0011	-0.0005	0.0036**	0.0031	0.0070**
Financing Agreements	-0.0012	-0.0029	-0.0033	-0.0003	-0.0024	0.0013
Contracts, Government (not defense)	-0.0035	-0.006	-0.0018	0.0005	-0.0003	0.0098
High-Yield Issuers	0.0005	0.0028	0.0064***	0.0044**	0.0032	0.0046
Initial Public Offerings	-0.0021	0.0024	0.0015	-0.0023	-0.0009	-0.0038
Insider Stock Buys	-0.0023	-0.0029	-0.0022	-0.0019	-0.0027	-0.0002
Insider Stock Sells	-0.0060**	-0.0058***	-0.0066**	-0.0041**	-0.0012	0.0069
Joint Ventures	-0.0050	-0.0041*	-0.0010	0.0044*	0.0011	0.0123**

Table II (continued)

News Events	Event Time of the Dependent Variable					Future Minus Past
	t-2	*t-1*	*t=0*	*t+1*	*t+2*	
Labor Issues	0.0000	0.0000	-0.0014	0.0018	0.0002	0.0033
Leveraged Buyouts	-0.0023	0.0166***	-0.0117**	-0.0016	-0.0055	-0.0233**
Liquidation	0.0010	-0.0216**	0.0008	-0.0163	0.0000	0.0085
Lawsuits	0.0064**	-0.0011	-0.0046	0.0003	0.0013	-0.0034
Market News	-0.0016	-0.0024	-0.0038	-0.0028	-0.0046	-0.0048
Management Issues	-0.0037	-0.0019	-0.0042	0.0003	-0.0021	0.0025
Money Market News	-0.0030	-0.0055	-0.0135*	-0.0014	-0.0111	-0.0016
Annual Meetings	-0.0084**	-0.0013	-0.0002	-0.0040	-0.0012	0.0046
10K	-0.0002	-0.0037	-0.0039	-0.0016	0.0000	0.0012
8K	-0.0017	-0.0024	-0.0007	-0.0003	-0.0001	0.0041
Stock Ownership	-0.0034**	-0.0032***	-0.0033**	-0.0019*	0.0002	0.0055**
Front Page Stories	-0.0049	-0.0037	-0.0045	-0.0037	-0.0034	0.0013
Product Distribution	-0.0052	-0.0021	-0.0032	0.0002	-0.0023	0.0043
New Products & Services	0.0029	-0.0008	-0.0010	0.0009	0.0034	0.0025
Personnel Appointments	-0.0011	0.0028*	0.0004	0.0018	0.0045**	0.0044
Point of View	-0.0006	0.0016	-0.0020	-0.0007	-0.0001	-0.0010
PRN Corporate Disclosure	-0.0195	-0.0321	-0.0171	0.0172	0.0063	0.0801
Corporate Restructurings	0.0039	0.0031	0.0014	-0.0016	0.0008	-0.0076
Research & Development	-0.0023	0.0005	-0.007	-0.0046	-0.0020	-0.0032
Bond Ratings & Comments	0.0015	-0.0001	0.0001	-0.0014	-0.0008	-0.0044
Short Interest Sales	-0.0195	-0.0078	-0.0096	-0.0014	0.0017	0.0268
Stock Options	-0.0022	-0.0029	-0.0038	-0.0036	-0.0035	0.0005
Stock Splits	0.0034	0.0025	0.006	0.0034	0.0118***	0.0093
Spinoffs	-0.0061	-0.0021	-0.0065	-0.0049	-0.0092	-0.0038
SPOT	0.0089***	-0.0014	0.0014	-0.0013	-0.0007	-0.0026
Shelf Registrations	-0.0023	-0.0038	-0.0036	0.0061	0.0011	0.0141
Shareholder Rights Plans	-0.0053	-0.0015	0.0021	0.0098	0.0040	0.0219
Press Releases (Auto-Published)	0.0087**	0.0011	0.0010	0.0001	-0.0012	0.0011
Acquisitions, Mergers, Takeovers	0.0026	0.0010	0.0011	0.0010	0.0013	-0.0002
Antitrust News	-0.0023	-0.0049	-0.0014	-0.0027	-0.0047	0.0005

Table III
Regression Analysis of Raw Short Volume around News Events

Table IIa contains the results of six regressions of short sales volume on a set of indicator variables representing stories in each of the news categories. Specifically, the dependent variable is the raw aggregate short volume (not scaled) and the independent variables are indicator variables that take the value one if there is a news story in a particular news category and zero otherwise. We vary the timing of the dependent variable relative to the news event in order to examine short volume changes around news. For example, *t-2* indicates that the dependent variable is observed two days prior to the news event. *Future Minus Past* indicates that the dependent variable is the difference in the short volume ratio between dates *t+2* and *t-2*. To control for the documented response of short sellers to past returns, we include two lags of daily returns. *** indicates significance at the 1% level, ** indicates significance at the 5% level, and * indicates significance at the 10% level.

| News Events | Event Time of the Dependent Variable | | | | | Future Minus Past |
	t-2	*t-1*	*t=0*	*t+1*	*t+2*	
Mean of the fixed effects	150,989	144,796	129,647	117,915**	154,310	-123,750***
Return (1 day lag)	417,746***	418,088***	386,685***	373,275***	405,006***	549,513***
Return (2 day lag)	198,026***	195,842***	194,974***	180,874***	177,340***	-761,974***
Analysts' Comments & Ratings	2,540	29,234***	76,809***	25,953***	11,406***	5,678
Buybacks	19,875***	22,546***	91,761***	54,262***	20,120***	33,025***
Bankruptcy-Related Filings	16,505*	20,681**	91,888***	45,725***	41,725***	47,730***
Corporate Governance	18,801**	22,551***	46,295***	30,808***	15,459**	2,389
Contracts, Nongovernment	5,600	2,635	15,326***	11,939***	3,840	8,176
Contracts, Defense	-37,064***	-29,608**	-9,405	-1,862	-10,080	54,981**
Dividend News	5,801**	1,971	12,001***	16,680***	7,661***	16,521***
Divestitures or Asset Sales	3,616	8,704	37,608***	9,392*	1,169	-3,634
Earnings	-8,706***	2,156	65,496***	66,441***	25,909***	10,1013***
Earnings Projections	-3,573	3,557	55,660***	45,439***	17,082***	63,330***
Financing Agreements	8,706	3,959	30,320***	12,915**	441	2,576
Contracts, Government (not defense)	-19,303**	-18,769**	-5,174	-6,272	-417	27,580
High-Yield Issuers	-2,371	-543	37,872***	5,606	2,694	11,645
Initial Public Offerings	15,599**	55,747***	59,552***	19,806***	8,457	-36,536**
Insider Stock Buys	14,152***	16,813***	7,330*	4,424	1,393	-26,275***
Insider Stock Sells	17,523***	5,706	-2,332	4,873	6,661	-10,966
Joint Ventures	5,755	-3,153	3,816	8,996	921	9,445

Table III (continued)

News Events	Event Time of the Dependent Variable					Future Minus Past
	t-2	*t-1*	*t=0*	*t+1*	*t+2*	
Labor Issues	6,721	14,333**	63,385***	33,002***	23,005***	37,023***
Leveraged Buyouts	22,403**	52,381***	166,901***	95,162***	40,664***	55,578***
Liquidation	61,447**	32,256	21,222	40,840*	149,844***	79,158
Lawsuits	4,146	13,993**	16,364***	14,744***	109	-551
Market News	5,274	19,270***	192,867***	84,758***	20,780***	85,346***
Management Issues	-7,557	-5,478	-8,716*	-3,908	-7,575	-172
Money Market News	82,864***	125,648***	295,893***	137,023***	52,127***	-20,271
Annual Meetings	908	9,414	15,754**	11,049*	9,432	11,559
10K	-21,936**	-26,384**	10,622	23,298**	1,349	72,636***
8K	7,996*	7,762*	13,209***	15,336***	4,241	7,098
Stock Ownership	2,660	9,526***	10,748***	10,734***	5,264**	4,708
Front Page Stories	19,282**	28,546***	89,258***	72,454***	32,484***	65,542***
Product Distribution	-11,108	3,602	8,154	4,205	-17,773**	-6,578
New Products & Services	-3,642	-4,443	-2,221	2,263	3,350	13,839
Personnel Appointments	1,926	-256	11,089***	6,107	2,626	7,584
Point of View	19,406**	19,561**	28,233***	15,256*	11,555	-8,813
PRN Corporate Disclosure	148,795***	100,331*	412,174***	149,477***	-42,598	-141,097
Corporate Restructurings	-144	8,722	55,834***	33,926***	-12,014*	16,458
Research & Development	14,569	-5,857	-11,387	-11,114	-5,425	-29,274
Bond Ratings & Comments	6,239	30,283***	74,153***	26,467***	2,772	-7,178
Short Interest Sales	53,460**	100,775***	3,539	30,500	-6,240	-119,140**
Stock Options	6,413	17,120**	93,771***	46,220***	42,602***	65,438***
Stock Splits	-4,126	30,284***	15,299**	1,970	-4,805	-28,624**
Spinoffs	-2,155	82,536***	66,732***	41,841***	29,931**	-14,583
SPOT	-2,081	-6,359	-24,628***	-12,632**	-3,807	-8,693
Shelf Registrations	-13,695	-26,112**	-10,046	24,123*	775	64,175***
Shareholder Rights Plans	4,673	-7,854	-40,795***	-5,471	21,003	22,443
Press Releases (Auto-Published)	-24	2,669	-6,268	10,205*	-1,219	6,576
Acquisitions, Mergers, Takeovers	1,990	-1,265	13,230***	8,128*	6,733	14,392*
Antitrust News	1,822	-9,089	21,611***	1,804	5,938	15035

Table IV
Cross-Sectional Relation between Returns, Short Sales, and News

Table II contains the results from Fama-MacBeth (1973) regressions using daily observations over the period January 3, 2005 through July 6, 2007. The dependent variable is the buy and hold (compound) return over the next 20 trading days. Panel A is calculated using raw returns as the dependent variable while Panel B uses characteristic adjusted returns as in Daniel, Grinblatt, Titman, and Wermers (1997). The *Short Volume Ratio* is daily short volume / total volume. *News Event* is an indicator variable that takes the value unity if a news event occurs for a particular stock, and *Short-News Interaction* is the product of *Short Volume Ratio* and the *News Event* indicator. $Return_{t=0}$ is the return on each stock on the day that short volume and news are observed and size is market capitalization from CRSP. T-statistics are below the parameter estimates in italics and are calculated using Newest-West (1987) standard errors with 20 lags. *** indicates significance at the 1% level, ** indicates significance at the 5% level, and * indicates significance at the 10% level.

Panel A: Raw Returns

	Model				
	(1)	**(2)**	**(3)**	**(4)**	**(5)**
Intercept	0.0171***	0.0173***	0.0171***	0.0169***	0.0401***
	(4.70)	*(4.79)*	*(4.73)*	*(4.82)*	*(5.46)*
Short Volume Ratio	-0.0053**	-0.0053**	-0.0043*	-0.0046*	-0.0052**
	(-2.19)	*(-2.20)*	*(-1.80)*	*(-1.95)*	*(-2.19)*
News Event		-0.0011	0.0001	0.0001	0.0027***
		(-1.49)	*(0.12)*	*(0.15)*	*(3.86)*
Short – News Interaction			-0.0058***	-0.0061***	-0.0087***
			(-3.02)	*(-3.25)*	*(-4.33)*
$Return_{t=0}$				0.0215	0.0214
				(1.30)	*(1.28)*
Size					-0.0017***
					(-3.86)

Panel B: DGTW Returns

Intercept	0.0054***	0.0056***	0.0054***	0.0053***	0.0276***
	(5.32)	*(5.16)*	*(4.93)*	*(4.59)*	*(5.35)*
Short Volume Ratio	-0.0069***	-0.0068***	-0.0057***	-0.0060***	-0.0064***
	(-3.27)	*(-3.27)*	*(-2.78)*	*(-2.93)*	*(-3.15)*
News Event		-0.0010*	0.0003	0.0004	0.0031***
		(-1.89)	*(0.43)*	*(0.50)*	*(4.91)*
Short – News Interaction			-0.0066***	-0.0069***	-0.0103***
			(-3.28)	*(-3.53)*	*(-5.44)*
$Return_{t=0}$				0.0218	0.0232
				(1.38)	*(1.46)*
Size					-0.0016***
					(-4.76)

Table V
Equity Returns Following Specific News Events

Table III examines equity returns following news events according to the model:

$$ret_{1,\,30} = \alpha + \beta_1 (ret_0) + \beta_2 \left(\frac{short\ vol}{market\ vol} \right) + \beta_3 (Size)$$

where the dependent variable is the cumulative excess return from day 1 to day 30 following the news event, ret_0 is the excess return on the day of the news event, and *Size* is measured using the market capitalization for each firm. Regressions are run individually for each news event and only when a news event occurs. Firm fixed effects are included and the intercept is the average of the fixed effects. T-statistics are reported below. *** indicates significance at the 1% level, ** indicates significance at the 5% level, and * indicates significant at the 10% level.

News Events	Intercept Estimate	Intercept t-stat	Return (t=0) Estimate	Return (t=0) t-stat	Short Volume Estimate	Short Volume t-stat	Size Estimate	Size t-stat
10K	0.0308	0.10	-1.8566	-7.50***	-0.0225	-0.20	-0.0029	-1.53
8K	0.0389	0.74	-0.1524	-2.08**	-0.0377	-1.67*	-0.0034	-5.36***
Acquisitions, Mergers, Takeovers	0.0601	1.06	-0.0899	-1.32	-0.0376	-1.95*	-0.0103	-6.62***
Analysts' Comments & Ratings	0.0589	1.33	0.0594	1.64	-0.0290	-1.91*	-0.0126	-7.73***
Annual Meetings	0.0292	-0.91	-0.4184	-1.99*	0.0208	0.58	-0.0020	-2.94***
Antitrust News	0.0052	-0.87	0.3840	2.81**	0.0617	1.95*	-0.0007	-1.09
Bankruptcy-Related Filings	0.0172	-1.54	-0.2417	-1.79*	0.0442	0.96	-0.0018	-2.39**
Bond Ratings & Comments	0.0250	1.11	0.0123	0.22	-0.0075	-0.37	-0.0022	-3.46***
Buybacks	0.0251	-1.16	0.0908	1.15	0.0051	0.20	-0.0017	-3.72***
Contracts, Defense	0.0300	1.23	-0.3989	-1.10	-0.0701	-0.86	-0.0008	-1.12
Contracts, Government (not defense)	0.0417	0.16	0.0232	0.08	-0.0225	-0.45	-0.0017	-1.83*
Contracts, Nongovernment	0.0520	0.50	-0.1270	-1.25	-0.0311	-1.31	-0.0056	-5.49***
Corporate Governance	0.0657	-0.32	-0.5019	-2.39**	-0.0311	-0.71	-0.0041	-4.08***
Corporate Restructurings	0.0396	-1.38	-0.0752	-0.79	-0.0726	-1.90*	-0.0015	-2.13**
Divestitures or Asset Sales	0.0397	0.20	0.1465	1.70*	-0.0511	-2.14**	-0.0026	-3.62***
Dividend News	0.0461	1.90*	-0.1628	-3.88***	-0.0095	-0.98	-0.0057	-9.44***
Earnings	0.0619	0.63	0.1404	5.23***	-0.0460	-4.27***	-0.0116	-11.53***
Earnings Projections	0.0648	0.61	0.0861	2.77***	-0.0642	-4.62***	-0.0103	-8.84***
Financing Agreements	0.0266	1.08	-0.3087	-2.73***	-0.0019	-0.06	-0.0025	-3.25***
Front Page Stories	0.0427	0.60	0.0595	0.26	-0.0231	-0.50	-0.0015	-2.26**
High-Yield Issuers	0.0436	1.07	-0.0315	-0.79	-0.0157	-1.06	-0.0138	-5.79***

Table V (continued)

News Events	Intercept		Return (t=0)		Short Volume		Size	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
Initial Public Offerings	0.0174	-1.14	0.2942	1.77*	0.0532	1.61	-0.0017	-2.18**
Insider Stock Buys	0.0233	0.21	-0.1961	-1.60	0.0153	0.78	-0.0025	-4.06***
Insider Stock Sells	0.0393	-1.50	-0.5851	-3.63***	-0.0265	-0.96	-0.0057	-3.23***
Joint Ventures	0.0519	1.70*	0.1532	0.98	-0.0402	-1.26	-0.0044	-4.57***
Labor Issues	0.0454	-0.01	0.1286	1.66*	-0.0258	-0.93	-0.0041	-3.78***
Lawsuits	0.0562	0.83	0.0838	0.77	-0.0445	-1.44	-0.0051	-4.27***
Leveraged Buyouts	0.0310	-0.65	0.2234	0.97	-0.0404	-0.66	-0.0011	-1.18
Liquidation	0.0027	0.34	-0.2923	-0.47	0.1241	0.88	-0.0006	-0.94
Management Issues	0.0573	1.04	0.2072	2.06**	-0.0593	-2.23**	-0.0061	-6.23***
Market News	0.0658	0.55	-0.3665	-5.25***	-0.0029	-0.09	-0.0058	-5.58***
Money Market News	0.0532	1.00	-0.9571	-3.03***	-0.1275	-1.64	-0.0004	-0.91
New Products & Services	0.0489	0.16	-0.1946	-1.32	-0.0901	-3.67***	-0.0039	-3.36***
Personnel Appointments	0.0485	1.02	-0.1866	-2.58**	-0.0256	-1.50	-0.0075	-7.23***
Point of View	0.0393	1.91*	-0.1158	-0.61	0.0049	0.10	-0.0041	-1.92*
Press Releases (Auto-Published)	0.0189	-0.21	0.3015	2.90***	0.0030	0.14	-0.0044	-2.12**
PRN Corporate Disclosure	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Product Distribution	0.0392	-1.17	-0.4197	-2.16**	-0.0592	-1.42	-0.0018	-2.52**
Research & Development	0.0378	2.25**	-0.1762	-0.73	-0.0580	-1.07	-0.0016	-1.95*
Shareholder Rights Plans	0.0508	-1.20	-1.3053	-1.29	-0.0724	-0.48	-0.0016	-1.36
Shelf Registrations	0.0220	2.39**	-0.2291	-0.41	-0.0451	-0.41	-0.0003	-0.20
Short Interest Sales	-0.1202	0.20	-0.4250	-0.40	0.1110	0.35	0.0047	0.32
Spinoffs	0.0402	-0.25	-1.2348	-3.83***	0.0685	0.57	-0.0022	-1.72*
SPOT	0.0370	1.19	0.1198	2.00**	-0.0331	-1.84*	-0.0107	-3.88***
Stock Options	0.0241	0.38	-0.0116	-0.10	0.0469	0.94	-0.0025	-3.13***
Stock Ownership	0.0426	0.91	0.0069	0.13	-0.0316	-3.62***	-0.0055	-8.49***
Stock Splits	0.0340	0.62	0.1181	0.78	-0.0534	-1.61	-0.0010	-1.48

Table VI
Short Volume Portfolio Returns following News Events

Table IV displays buy and hold portfolio returns for a 12 months period following news events. Each day for each news event, two portfolios are formed: the first portfolio consists of those firms that had a specific news event and had low short volume as a percentage of total volume; the second portfolio consists of those that had the news event and had high short volume as a percentage of total volume. In addition, we form control portfolios using a sample of firms that did not experience the news event but were similar in terms of market capitalization, institutional ownership, and the number of news events over the previous month. *Difference* is the return of the *High* portfolio less the *Low* portfolio, and *Difference in Difference* is the *Difference* value of the Event Sample less the *Difference* value of the Control Sample. *** indicates significance at the 1% level, ** indicates significance at the 5% level, and * indicates significant at the 10% level.

News Events	Event Sample: 12 Month Returns			Control Sample: 12 Month Returns			Difference in Difference
	Low	High	Difference	Low	High	Difference	
10K	3.06%	5.21%	2.16%	5.69%	4.55%	-1.13%	3.29%
8K	3.25%	-1.12%	-4.37%	2.73%	4.97%	2.24%	-6.61%
Acquisitions, Mergers, Takeovers	4.16%	2.09%	-2.07%	4.86%	4.99%	0.13%	-2.21%
Analysts' Comments & Ratings	3.57%	-0.82%	-4.39%	4.70%	5.78%	1.08%	-5.46%
Annual Meetings	1.36%	0.07%	-1.28%	7.76%	5.10%	-2.66%	1.38%
Antitrust News	3.02%	1.84%	-1.18%	6.91%	7.93%	1.02%	-2.20%
Bankruptcy-Related Filings	5.19%	4.18%	-1.01%	8.23%	4.18%	-4.05%	3.04%
Bond Ratings & Comments	2.91%	1.44%	-1.47%	4.01%	6.75%	2.74%	-4.21%
Buybacks	3.63%	0.99%	-2.65%	1.11%	4.32%	3.21%	-5.86%
Contracts, Defense	9.16%	4.61%	-4.55%	14.38%	13.55%	-0.83%	-3.72%
Government Contracts (not defense)	5.39%	6.76%	1.36%	17.36%	6.51%	-10.85%	12.21%
Contracts, Nongovernment	4.03%	3.12%	-0.90%	3.00%	4.63%	1.62%	-2.53%
Corporate Governance	3.78%	2.22%	-1.56%	1.53%	9.20%	7.67%	-9.23%
Corporate Restructurings	3.91%	3.16%	-0.76%	-1.08%	7.64%	8.71%	-9.47%
Divestitures or Asset Sales	3.07%	1.72%	-1.35%	4.66%	7.41%	2.76%	-4.11%
Dividend News	3.70%	-0.04%	-3.74%	3.59%	3.32%	-0.28%	-3.46%
Earnings	6.01%	0.19%	-5.82%	1.44%	3.51%	2.07%	-7.89%
Earnings Projections	5.29%	0.47%	-4.83%	2.47%	4.18%	1.71%	-6.53%
Financing Agreements	1.73%	1.28%	-0.45%	2.72%	6.29%	3.57%	-4.02%
Front Page Stories	3.71%	5.27%	1.56%	-1.46%	3.15%	4.61%	-3.06%
High-Yield Issuers	3.36%	-0.13%	-3.50%	2.49%	7.55%	5.06%	-8.56%
Initial Public Offerings	3.98%	5.12%	1.14%	6.67%	9.31%	2.64%	-1.50%
Insider Stock Buys	1.04%	-0.20%	-1.24%	5.34%	4.46%	-0.88%	-0.35%
Insider Stock Sells	2.53%	-1.91%	-4.44%	3.60%	2.91%	-0.70%	-3.74%

Table VI (continued)

News Events	Event Sample: 12 Month Returns			Control Sample: 12 Month Returns			Difference in Difference
	Low	High	Difference	Low	High	Difference	
Joint Ventures	5.25%	3.30%	-1.94%	5.22%	5.87%	0.64%	-2.59%
Labor Issues	1.95%	2.50%	0.56%	4.21%	6.30%	2.08%	-1.53%
Lawsuits	7.68%	2.85%	-4.83%	4.81%	7.55%	2.74%	-7.57%
Leveraged Buyouts	0.42%	0.74%	0.32%	1.09%	6.57%	5.47%	-5.15%
Liquidation	3.05%	7.77%	4.72%	-0.30%	0.22%	0.52%	4.20%
Management Issues	2.77%	0.39%	-2.38%	2.57%	7.28%	4.71%	-7.09%
Market News	3.38%	2.13%	-1.24%	8.55%	3.92%	-4.63%	3.38%
Money Market News	1.98%	4.75%	2.77%	2.30%	18.72%	16.43%	-13.66%
New Products & Services	6.81%	-0.09%	-6.90%	8.03%	6.31%	-1.72%	-5.18%
Personnel Appointments	4.48%	0.84%	-3.63%	1.85%	3.96%	2.11%	-5.74%
Point of View	6.03%	-0.10%	-6.14%	12.56%	4.15%	-8.42%	2.28%
Press Releases (Auto-Published)	5.18%	4.16%	-1.02%	3.06%	5.64%	2.57%	-3.59%
PRN Corporate Disclosure	-9.07%	-15.18%	-6.10%	-1.32%	14.90%	16.22%	-22.32%
Product Distribution	3.40%	-0.53%	-3.93%	3.10%	7.06%	3.96%	-7.89%
Research & Development	3.85%	4.84%	0.99%	2.67%	4.14%	1.47%	-0.48%
Shareholder Rights Plans	2.52%	0.10%	-2.42%	-3.25%	10.73%	13.98%	-16.40%
Shelf Registrations	4.10%	1.70%	-2.40%	0.02%	10.86%	10.83%	-13.23%
Short Interest Sales	-0.55%	-4.64%	-4.09%	-3.53%	11.95%	15.48%	-19.57%
Spinoffs	2.77%	3.20%	0.43%	8.20%	5.64%	-2.56%	2.98%
SPOT	5.09%	0.24%	-4.85%	1.13%	3.35%	2.22%	-7.07%
Stock Options	6.00%	3.93%	-2.07%	8.05%	7.62%	-0.43%	-1.65%
Stock Ownership	3.61%	0.73%	-2.88%	5.45%	1.58%	-3.87%	0.99%
Stock Splits	5.32%	3.08%	-2.24%	8.67%	5.63%	-3.04%	0.80%
Mean							-4.27%
Median							-3.74%
T-statistic							-4.71***
Wilcoxon *Z* Score							-4.34***