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Abstract

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Keywords: Short Sale Restrictions, Short Selling, Regulation SHO, Pilot Program

JEL Classification: G14, G18, G30, G34

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1. Introduction

A maintained virtue of a market economy is that market prices provide valuable information to decision makers and that decision makers, whether they be consumers or producers, take this information into account when making decisions. Despite this virtue, many regulators around the world have limited an important part of the price-setting process during times when it is most needed. That is, in times of heightened uncertainty, regulators have restricted or completely banned short selling for a specified period of time. For example, more than 20 developed countries including France, the U.K., Belgium, and South Korea, among others, imposed restrictions on short selling in response to the Covid-19 pandemic (Nunn and Kulan (2021)).¹ Similar restrictions were also put in place around the globe, including in the US, during the 2008-2009 global financial crisis, the 2011-2012 European debt crisis, and the 2011 US sovereign credit rating downgrade.²

During these episodes, short sellers have been accused of intensifying or instigating downward price movements. In response, many regulators have banned or restricted short sales in hopes of “restor[ing] equilibrium to markets” and “combat[ing] market manipulation [by short sellers] that threatens investors and capital markets.”³ In addition, the actions of short sellers have often aroused the criticism of corporate managers whose firms become the targets of short selling. An illustrative example comes from Elon Musk, the CEO of Tesla: “[t]hey’re constantly trying to make up false rumors and amplify any negative rumors. It’s a really big incentive to lie and attack my integrity.”⁴ This disdain by both regulators and corporate managers has led to short sellers

¹ <https://som.yale.edu/story/2021/short-selling-restrictions-during-covid-19>.

² See, for example, Nunn and Kalum (2021) and Bessler and Vendrasco (2021) on the Covid-19 Pandemic, Battalio, Mehran, and Schultz (2011) on the 2011 downgrade of the US sovereign credit rating, Beber and Pagano (2013) on the Global Financial Crisis and Jones (2012) on the Great Depression.

³ See SEC News Release 2008-211 “SEC Halts Short Selling of Financial Stocks to Protect Investors and Markets”.

⁴ “Elon Musk: The Architect of Tomorrow,” Neil Strauss, November 15, 2017. Similar sentiments include, for example, Jamie Dimon’s (CEO of JP Morgan), discussion of the role of short sellers in the downfall of Bear Stearns in “S.E.C. Unveils Measures to Limit Short-Selling,” Jenny Anderson, July 16, 2008 or Patrick Byrne’s (CEO of Overstock) allegation against short sellers in “Overstock’s Phantom Menace,” Bethany McLean, November 1, 2005.

being an easy target in times of heightened uncertainty leading to short-term restrictions on short selling.

This action runs counter to one of the basic premises of efficient markets. Short sellers, so the argument goes, search for information and, when they come upon information that indicates a stock is overpriced, take a position that accords with that view. This offsetting position has been shown to be important in enforcing the law of one price and empirical studies have supported the proposition that short sellers, on average, do make informed trades and improve market efficiency.⁵ In addition, research has also shown that managers take in and learn from these more informed prices.⁶ As such, one potential cost of a short selling restriction is that the constraint could have significant implications for managerial decision-making and cause managers to become less sensitive to stock price movements. This perspective leads to a trade-off for regulators: does the perceived risk reduction from the restriction of short selling outweigh the potential reduction in market information during times of heightened uncertainty?

In this paper, we address the cost side of this trade-off in the context of corporate takeover attempts when there is a restriction on the role of short sellers. Consider the decision process of an acquiring firm's manager of whether to pursue or abandon a proposed acquisition. Prior to the announcement of the acquisition attempt, the acquiring firm's manager form their expectation of the net present value (henceforth, NPV) of the acquisition. Presumably, managers initiate an acquisition attempt only when the calculated NPV of the acquisition is positive. At the

⁵ See, for example, Miller (1977), Diamond and Verrecchia (1987), Senchack and Starks (1993), Desai, Ramesh, Thiagarajan, and Balachandran (2002), Duffie, Garleanu, and Pedersen (2002), Asquith, Pathak, and Ritter (2005), Bris, Goetzmann, and Zhu (2007), Boehmer, Jones, and Zhang (2008), Saffi and Sigurdsson (2011), Engelberg, Reed, and Ringgenberg (2012), Boehmer and Wu (2013), Curtis and Fargher (2014), Akbas, Boehmer, Erturk, and Sorescu (2017), and Hwang, Liu, and Xu (2019), among others.

⁶ See, for example, Gilchrist, Himmelberg, and Huberman (2005), Grullon, Michenaud, and Weston (2015), He and Tian (2016), among others.

announcement of the attempt, the stock market reacts, and the price change of the acquiring firm's stock is observed by the manager.

When the stock price change is positive, the manager continues to pursue the acquisition. When the stock price change is negative, the manager may reconsider the opportunity and may choose to discontinue the acquisition effort. In part, the manager's decision depends upon the credibility of the information conveyed by the price signal. If short selling is unimpeded and the manager views short sellers as informed traders, the manager may assign more weight to the price changes than when short selling is impeded. That is, given all else equal, managers may be more likely to discontinue a takeover attempt when the stock price change is more negative and short selling is unimpeded. That is the proposition that we consider in this study. The alternative, of course, is that managers do not believe that short sellers are more informed and, therefore, short sellers, whether constrained or not, do not play a role in the decision-making process of managers.

The setting of our empirical study is a randomized experiment on short selling activities in the US equity markets: the Rule 202T pilot program of Regulation SHO in which stocks in the Russell 3000 index were ranked by trading volume within each exchange and every third stock was designated as a pilot stock. From May 2, 2005, through July 6, 2007, pilot stocks were exempt from the tick test for exchange-listed stocks and the bid test for NASDAQ stocks (henceforth, collectively, uptick tests). The exemption from the short sale uptick tests exogenously eliminated these impediments to short selling in a randomly chosen set of pilot stocks during the program.⁷ The short sale uptick tests remained in place for nonpilot stocks during this time period. After July 6, 2007, the SEC eliminated short sale uptick tests for all exchange-listed stocks.

⁷ Securities and Exchange Commission (SEC), 2007, Economic analysis of the short sale price restrictions under the regulation SHO pilot, Office of Economic Analysis.

This setting gives rise to three time periods over which we conduct our tests. The first we label the pre-SHO period, the second the SHO period, and the third the post-SHO period. The first period encompasses January 1, 2002-May 1, 2005; the second encompasses May 2, 2005-August 6, 2007; and the third encompasses August 7, 2007-December 31, 2010. During the pre-SHO period short sellers in all stocks were subject to the uptick tests. During the SHO period, only short sellers in nonpilot stocks were subject to the uptick tests. During the post-SHO period, short sellers in no stocks were subject to the uptick tests. This setting allows for a comparison of the difference between managers of pilot and nonpilot firms in their sensitivity to stock price changes in making the decision to abandon (or complete) their proposed acquisitions when short sellers are impeded and unimpeded by the uptick tests in participating in the price setting process.

We examine the question in a linear probability regression analysis using 756 proposed acquisitions, each with a transaction value of at least \$100 million and each of which was accompanied by a negative stock price reaction at its announcement during the period of January 1, 2002, through December 31, 2010. The dependent variable in our analysis is whether the proposed acquisition is abandoned (or not). The key independent variables are the acquiring firm's stock price changes at the announcement of the acquisition attempt (i.e., the acquiring firm's 3-day announcement period CAR), an indicator that is assigned the value of one if the acquiring firm's stock is a pilot stock, an indicator that is assigned the value of one if the acquisition is announced during the SHO period, and, importantly, the interaction of these three variables.

To begin, we find that proposed value-reducing acquisitions⁸ are more likely to be abandoned the more negative the stock price reaction at the announcement of the proposed

⁸ We define value-reducing acquisition attempts as those that are accompanied by a negative stock price reaction at the announcement of the deal as measured by the acquiring firm's 3-day announcement period CAR.

transaction. That is, we find, as do others, that managers are sensitive to the stock price reaction in making the decision to abandon value-reducing acquisition attempts.⁹

We further find that, during the pre-SHO period, the sensitivity to stock price changes in making the decision to abandon value-reducing acquisition attempts is not different between managers of pilot and nonpilot firms. That is, during this period in which the short selling of all stocks was impeded by the uptick tests, managers of pilot and nonpilot firms are equally sensitive to stock price reactions in assessing whether to abandon value-reducing acquisition attempts.

In contrast, during the SHO period, in making that decision, managers of pilot firms are more sensitive to stock price changes than are managers of nonpilot firms. In particular, the coefficient of the triple interaction term is negative at -2.087 and statistically significant with a p-value less than 0.01. The significance of this variable indicates that managers are more sensitive to stock price changes when short selling is less impeded. To be more emphatic, in making potentially critical decisions about major acquisition attempts, managers are more sensitive to the stock price reaction when short sellers are more likely to be playing a role in the price setting process. Considering that the average likelihood of the abandonment of value-reducing acquisition attempts during the full sample period is 4.23% and, holding constant the acquiring firm's announcement period CAR at its mean of -3.81%, managers of pilot firms are 7.95% more likely to abandon the proposed acquisitions than are managers of nonpilot firms during the SHO period compared to the pre-SHO period.

In sum, despite managers' dislike of short sellers, they are more, rather than less, sensitive to price changes when short sellers are less impeded in playing a role in the price setting process.

⁹ See, for example, Luo (2005), Chen, Harford, and Li (2007), Kau, Linck, and Rubin (2008), Masulis, Wang, and Xie (2009), and Liu and McConnell (2013) who report that managers are more likely to abandon acquisition attempts the lower the stock returns of the acquirer at the announcement of the potential acquisition.

This relation provides evidence that short-selling restrictions could have significant implications for managers in their decision-making process. With those results in mind, we then assess whether managers' estimated sensitivity to the price information provided by short sellers differs between instances in which managers are likely to put more or less weight on markets prices in deciding whether to abandon (or complete) an acquisition attempt.

Presumably managers of acquiring firms are likely to put more weight on market prices in their decision-making when there is greater asymmetry between the operations of the acquiring and target firms and/or when the operations of the target are more opaque. As proxies for these circumstances, we presume that the operations of the acquiring and target firms are less similar when the two firms are in different industries and that the operations of the target are more opaque when the target is in a high-tech industry. In both instances, we propose that the acquiring firm's stock price reaction is likely to be more informative to the acquiring firm's manager than in other instances. We find that managers of pilot firms are more likely to abandon value-reducing acquisition attempts during the SHO period than are the managers of nonpilot firms when the target is in an industry that is different from the acquirer's industry or when the target is a high-tech firm. That is, managers are more sensitive to the stock price reaction when short selling is unimpeded and when managers put more weight on market prices in deciding whether to abandon the proposed acquisitions.

Finally, a significant literature reports that weak corporate governance sometimes allows managers to pursue value-reducing acquisitions.¹⁰ If so, the prediction is that managers are more likely to be sensitive to the stock price reaction when short sellers are unimpeded by the uptick test

¹⁰ See, for example, Jensen and Meckling (1976), Jensen (1986), Morck, Shleifer, and Vishny (1989), Masulis, Wang, and Xie (2007), and Yim (2013) who report that managers complete value-reducing acquisitions for reasons other than the impact of the acquisition on firm value.

and when the acquiring firm is guided by stronger corporate governance. Using the *E-Index* as a proxy for the strength of corporate governance, we find that managers of pilot firms with stronger shareholder rights are more sensitive to the stock price reaction in making the decision to abandon value-reducing acquisition attempts during the SHO period than are the managers of nonpilot firms.¹¹ That is, managers are more sensitive to the stock price reaction when short selling is unimpeded and when the firm is guided by stronger corporate governance.

In short, our further examinations of managers' sensitivity to the stock price reaction in the decision to abandon (or complete) value-reducing acquisition attempts based either on the type of target or on the corporate governance of the acquirer indicate that when short sellers are less impeded in the price setting process, managers are more sensitive to stock price reactions in their decisions to abandon (or complete) an acquisition when the acquirer's operations are different from those of the target or when the acquirer is guided by stronger corporate governance.

Our results should be of particular interest to regulators who are concerned with whether short sale restrictions are an effective tool in responding to heightened market uncertainty. Our evidence shows there is a cost of restricting short sellers in the form of less market price information during such periods. Whether that cost outweighs the perceived benefits of short sale restrictions is the challenge for regulators.

2. Institutional Background and Hypothesis Development

2.1. Institutional Background

Short sale price tests, introduced in the 1930s in US equity markets, are trading restrictions that limit when a short sale can be made. One such rule, known as the "uptick test," was adopted by the SEC in 1938 as a part of Rule 10a-1 and continued in force until 2007. According to Pessin

¹¹ See Bebchuk, Cohen, and Ferrell (2009)

(1978), the rule was designed to curtail “groups of speculators from pooling their capital and selling short for the sole purpose of driving down the stock price of a particular security to a level where the stockholders would panic and unload their fully owned shares.” The uptick test mandates that a short sale must be at a price either above the last traded price of the security or at the last traded price when the most recent movement between traded prices was upward. In 1994, the National Association of Securities Dealers (NASD) adopted its own stricter price test, the “bid test,” under Rule 3350. The bid test requires that a short sale occur at a price at least one penny above the bid price if the bid is a downtick from the previous bid.

On July 28, 2004, the SEC issued the Securities Exchange Act Release No. 50104 (available at <http://www.sec.gov/rules/other/34-50104.htm>). This Act suspended the operation of short sale uptick tests for a group of stocks during a pilot period. To select the stocks in the pilot program, the SEC first sorted firms in the Russell 3000 as of June 2004 into three groups -- Amex, Nasdaq-NM and NYSE, excluding stocks that went public or had a spin-off between April 30, 2004, and July 28, 2004, or were not subject to uptick tests as of June 25, 2004. The securities in each group were, then, ranked from highest to lowest average daily dollar volume for the period of June 2003–May 2004. In each group, every third stock was selected to be in the pilot study yielding a total of 986 stocks that would trade without being subject to any uptick tests during the pilot program.

As set forth by the SEC, from May 2, 2005, through August 6, 2007, pilot stocks were to be exempt from short sale price tests. The program effectively ended one month early on July 6, 2007, when the SEC eliminated short sale price tests for all exchange listed stocks. The SEC stated that “[t]he general consensus was that the Commission should remove price test restrictions because they modestly reduce liquidity and do not appear necessary to prevent manipulation.”¹²

¹² <http://www.sec.gov/rules/other/34-50104.htm>

The decision to remove all short sale price tests was met with hostility by managers, politicians, and the media. Just one month after the decision, Muriel Siebert, founder of Siebert Financial Corporation and former state banking superintendent of New York, asserted that the removal of the uptick rule on short sales “may be exacerbating the downdrafts when they come along.”¹³ US Senator John McCain stated that the removal of the uptick rule on short sales “allowed abusive short-selling, or bearish bets on a company's stock, to turn our markets into a casino.”¹⁴ Prominent economic commentator Jim Cramer called for the restoration of the uptick rule and claimed that “only then will the shorts lose the upper hand, and the market will become a safer, fairer place for you to invest.”¹⁵

In April 2009, the SEC voted to seek public comment on proposals to restore a form of the uptick rule. In February 2010, the SEC adopted the alternative uptick rule by amending Rules 200(g) and 201 of Regulation SHO. The alternative uptick rule is triggered when a security's price falls by 10% or more from the previous day's closing price. The rule is in effect until the close of trading the next day.¹⁶

2.2. Hypothesis Development

Prior studies report that a manager's decision to abandon a proposed corporate acquisition is negatively correlated with the stock price reaction at the announcement of the proposed acquisition (Luo (2005), Chen, Harford, and Li (2007), Kau, Linck, and Rubin (2008), and Masulis, Wang, and Xie (2009)). The more negative the stock price reaction, the more likely the proposed acquisition is to be abandoned. The common interpretation of this result is that managers “listen

¹³ See Morgenson, Gretchen. “Why the roller coaster seems wilder,” The New York Times. August 26, 2007.

¹⁴ See Meckler, Laura and Scannell, Kara. “McCain Says Cox Should Be Fired as SEC Chief Amid 'Casino' Markets” The Wall Street Journal. September 18, 2008.

¹⁵ See Carney, John. “Bring Back the Uptick Rule?” Business Insider. November 18, 2008.

¹⁶ See <https://www.sec.gov/news/press/2010/2010-26.htm> for the SEC's press release announcing the adoption of the alternative uptick rule.

to the market” when deciding whether to abandon (or complete) their proposed acquisitions. The question that we address here is whether managers are more (or less) likely to listen to the market when short sellers are less impeded in playing a role in the price setting process.

On the one hand, the sentiments expressed by Elon Musk and similarly inclined CEOs leads to the conclusion that “lying” short sellers are not to be trusted. It is a short step from there to the implication that stock prices set in part by the unimpeded trading of short sellers are less informative than when short sellers’ trading activities are impeded. And from there it is a short step to the implication that managers should ignore the stock price reaction to an acquisition announcement when short sellers are unimpeded in their trading activities.

On the other hand, a review of the literature on the trading activities of short sellers leads to the conclusion that short sellers are astute traders who understand the price setting process well.¹⁷ It is a short step from there to the implication that stock prices set in part by the unimpeded trading of short sellers are more informative than when short sellers’ trading activities are impeded. And from there it is a short step to the implication that managers should be especially sensitive to the stock price reaction to an acquisition announcement when short sellers are unimpeded in their trading activities.

We use the Regulation SHO pilot program to examine these alternative possibilities. The pilot program classifies firms into two groups, pilot and nonpilot firms, wherein pilot firms were (exogenously) selected to be exempt from short sale uptick tests during the program. This exemption allows short sellers’ involvement in the price setting process to be less impeded. We use this difference to test whether managers are more (or less) sensitive to stock price changes when short sellers are less impeded.

¹⁷ See, for example, Boehmer and Wu (2013), Saffi and Sigurdsson (2011), Massa, Zhang, and Zhang (2015), Bris, Goetzmann, and Zhu (2007), Beber and Pagano (2013), and Charoenrook and Daouk (2009) among others.

3. Data and Variable Construction

3.1. Value-reducing acquisition attempts

Using the list published by the SEC, we identify an initial sample of 986 pilot stocks and 1,966 nonpilot stocks.¹⁸ Of the 986 pilot stocks, 49.9% (492) are listed on NYSE, 47.9% (472) are listed on NASDAQ-NM, and 2.2% (22) are listed on Amex. The distribution of the nonpilot stocks is similar with 50.0% (982) listed on NYSE, 48.0% (944) on NASDAQ-NM, and 2.0% (40) on Amex.

We obtain proposed acquisitions from the *Thomson Financial Securities Data Company's (SDC) US Mergers and Acquisitions* database. We begin with all transactions classified as a “merger,” “acquisition,” or “acquisition of a majority interest” that were announced between January 1, 2002, and December 31, 2010.

To be included in the sample for analysis: (1) the potential acquirer must be a publicly traded US firm with stock price data available on the *Center for Research in Security Prices (CRSP)* database during the period of 53 trading days prior to the announcement through one trading day after the announcement of the acquisition; (2) the firm must have accounting data available on the *Compustat* database in the year prior to the announcement of the acquisition attempt; (3) the acquirer must be designated as a pilot or nonpilot firm at the start of the Regulation SHO pilot program; (4) the proposed acquirer must own less than 50% of the target firm's shares prior to the announcement of the acquisition attempt and must seek to own 100% of the target firm's shares as a result of the acquisition; (5) the proposed transaction must have a value of at least \$100 million;

¹⁸ The SEC initially published a list of 986 pilot stocks (available at <https://www.sec.gov/rules/other/34-50104.htm>) on July 28, 2004. The list was later updated to 948 pilot stocks to account for business combinations, permanent delistings, and other corporate events (available at <https://www.sec.gov/spotlight/shopilot.htm>). For robustness, we re-estimate our models using the updated list of pilot stocks and find quantitatively similar results. These results are reported in the Internet Appendix.

and (6) the acquisition attempt must be classified as “withdrawn” or “completed.” Table I reports the number of observations dropped due to each of these requirements.

These criteria produce a total of 1,582 acquisition announcements by 801 potential acquiring firms over the nine-year period of 2002–2010. For the purposes of this study, we focus on acquisition attempts that are accompanied by a negative stock price reaction at their announcement (“value-reducing acquisition attempts”). To identify such attempts, we compute the cumulative abnormal return (henceforth, CAR) using the market model. We compute CARs using a three-day interval (-1, +1), where event day 0 is the announcement day of the proposed acquisition. Abnormal returns are calculated as the residuals from a market model with the maximum estimation interval of (-252, -10) trading days and the minimum interval of (-52, -10) trading days. The market return used in the estimation is the CRSP value-weighted return. Focusing only on value-reducing acquisition attempts results in a set of 756 acquisition announcements by 473 acquirers. There are 279 acquisition announcements in the *pre-SHO* sample, 259 in the *SHO* sample, and 218 in the *post-SHO* sample period. In terms of the number of observations per year, this sample size is similar to prior studies that focus on value-reducing acquisitions.¹⁹

3.2. Key independent variables

We create an indicator variable *Pilot* to denote stocks that were selected as pilot stocks in the Regulation SHO pilot program. Pilot stocks are the treatment sample and nonpilot stocks are the control sample. We construct three variables to indicate three subperiods: *pre-SHO* equals one if the acquisition attempt announcement falls between January 1, 2002 and May 1, 2005 and zero otherwise; *SHO* equals one if the acquisition attempt announcement falls between May 2, 2005 and

¹⁹ See, for example, Henry (2004), Liu and McConnell (2013), Chen, Harford, and Lin (2015), Becht, Polo, and Rossi (2016), and Bereskin, Byun, Officer, and Oh (2018) among others.

August 6, 2007 and zero otherwise; and *post-SHO* equals one if the acquisition attempt announcement falls between August 7, 2007 and December 31, 2010 and zero otherwise.

3.3. Control variables

To isolate the effect of short selling on the acquirer's decision to abandon (or complete) an acquisition that has been announced, we control for other variables that have been shown in prior studies to be correlated with the likelihood of acquisition abandonments. Walkling (1985) and Kau, Linck, and Rubin (2008) find that when the target firm undertakes defensive tactics to fend off an unwanted acquisition attempt (*Defense Dummy*), the transaction is more likely to be abandoned. Walkling (1985), Jennings and Mazzeo (1991), Kau et al. (2008), and Masulis, Wang, and Xie (2009) report that the emergence of a competing acquirer (*Compete Dummy*) is positively correlated with the likelihood of transaction abandonment. Huang and Walkling (1987) and Kau et al. (2008) find that when the proposed method of payment includes the stock of the acquiring firm (*Stock Dummy*), the transaction is more likely to be abandoned. Bates and Lemmon (2003) and Kau et al. (2008) report that a receptive "attitude" on the part of the target (*Hostile Dummy*), the presence of tender offers (*Tender Offer Dummy*), and the presence of termination fees (*Termination Fee Dummy*) all decrease the likelihood of abandonment. Burch (2001) and Kau et al. (2008) report that when the proposed transaction includes an option for the acquirer to purchase shares at a fixed price even if a competing offer emerges (*Lockup Dummy*), the acquisition attempt is less likely to be abandoned. Chen, Harford, and Li (2007) and Kau et al. (2008) find that the larger the market capitalization of the equity of the potential acquirer ($\ln(\text{Market Cap})$), the less likely the transaction is to be abandoned. Luo (2005) finds that if the acquiring and target firm are headquartered in the same state (*Same State HQ Dummy*), the acquisition attempt is less likely to be abandoned and if the acquisition has a definitive agreement (*Definitive Agreement Dummy*), the acquisition attempt is more likely to be abandoned.

3.4. Descriptive statistics

Table II presents the time series and industry composition of the acquisition attempts according to the primary industry of the acquiring firm. Panel A reports the distribution of acquisition announcements across years; Panel B shows the distribution across industries. This sample covers all 11 of the Global Industry Classification Standard (GICS) sectors.

Table III presents descriptive statistics of the independent variables for the pilot and nonpilot firms along with statistical tests that show whether the means and medians are different between the two groups. As shown in Panels A and B, we do find some fundamental differences between the two types of acquisitions. Pilot firms are smaller and have a larger equity Market-to-Book (M/B) ratio than nonpilot firms; the targets of pilot firms are more likely to have multiple potential acquirers; and when the acquirer is a pilot firm, the acquirer is more likely to be headquartered in the same state as the target.

4. Empirical Results

In this section, we compare the difference between the managers of pilot and nonpilot firms in their sensitivity to stock price changes in making the decision to abandon acquisition attempts when short sellers are impeded and unimpeded by the uptick tests in the price setting process.

4.1. Univariate analysis of abandonments of corporate acquisition attempts

We first compare the percentage of proposed value-reducing acquisition attempts abandoned by pilot and nonpilot firms during the *pre-SHO*, *SHO*, and *post-SHO* period. The comparison is illustrated in Figure I. During the *pre-SHO* period, the difference between pilot and nonpilot acquirers in terms of the percentage of value-reducing acquisition attempts abandoned was -0.086%. This difference between pilot and nonpilot acquirers in abandonment rate increases to 1.329% during the *SHO* period. During the *post-SHO* period, the difference in abandonment rate reverts to -0.072%.

These univariate results support the proposition that, during the pre-SHO period, when short selling is equally impeded by the uptick rule, managers of pilot and nonpilot firms are no different in their propensity to abandon proposed value-reducing acquisitions. In contrast, during the SHO period, managers of pilot firms are more likely to abandon proposed value-reducing acquisitions than managers of nonpilot firms when pilot firms are unimpeded by the uptick rule. Further, during the post-SHO period, when short selling is equally unimpeded by the uptick rule, managers of pilot and nonpilot firms are no different in their propensity to abandon proposed value-reducing acquisitions.

4.2. Linear probability regressions of acquisition attempt abandonments

4.2.1. Acquiring firm's CAR

We now examine the relation between the likelihood of abandonment of value-reducing acquisition attempts and the acquiring firm's stock price reaction at the announcement of the proposed acquisition controlling for other factors. To do so, we estimate the following linear probability model:

$$Abandonment = \beta_0 + \beta_1 CAR + \gamma Controls + \delta YearDummies + \theta IndustryDummies + \varepsilon, \quad (1)$$

where the dependent variable equals one for abandoned acquisition attempts and zero otherwise.

The coefficient of interest is β_1 .

The results of the regression are reported in Column 1 of Table IV. The estimated coefficient of CAR is -0.582 with a p-value less than 0.01. That is, the more negative is the stock price reaction, the greater the likelihood that the proposed acquisition will be abandoned across the full sample of value-reducing acquisition attempts. This result is consistent with the findings of

prior studies that managers are sensitive to stock price changes when deciding whether to abandon (or complete) proposed value-reducing acquisitions.

4.2.2. Acquiring firm's CAR and Regulation SHO

We next examine whether acquiring firm managers' sensitivity to stock price reaction in the decision to abandon proposed value-reducing acquisitions is greater (or less) when short selling of the acquiring firm's stocks is unimpeded by the uptick rule in a multivariate setup. Specifically, we estimate the following linear probability model:

$$\begin{aligned} Abandonment = & \beta_0 + \beta_1 CAR + \beta_2 Pilot + \beta_3 SHO + \beta_4 PostSHO + \beta_5 CAR \times Pilot + \\ & \beta_6 CAR \times SHO + \beta_7 CAR \times PostSHO + \beta_8 Pilot \times SHO + \beta_9 Pilot \times PostSHO + \\ & \beta_{10} CAR \times Pilot \times SHO + \beta_{11} CAR \times Pilot \times PostSHO + \gamma \text{ Control Variables} + \\ & \delta \text{ Year Dummies} + \theta \text{ Industry Dummies} + \varepsilon, \end{aligned} \quad (2)$$

where the dependent variable equals one for abandoned acquisition attempts and zero otherwise. The coefficient estimates of interest are those of the two triple interaction terms, β_{10} for the variable $CAR \times Pilot \times SHO$, and β_{11} for the variable $CAR \times Pilot \times PostSHO$.

The results of the multivariate analysis are given in Column 2 of Table IV. Several items merit comment. First, the coefficient estimate of *Pilot*, β_2 , is -0.001 with a p-value of 0.96, indicating that, during the *pre-SHO* period, when short selling is equally impeded by the uptick rule for both pilot and nonpilot firms, the sensitivity of managers to stock price changes when deciding whether to abandon value-reducing acquisition attempts is no different between pilot and nonpilot firms.

Second, the estimated coefficient of the triple interaction term, $CAR \times Pilot \times SHO$, is -2.087 with a p-value < 0.01, indicating that holding *CAR* constant at the mean of -3.81%, managers of pilot acquiring firms are 7.95% more likely to abandon proposed value-reducing acquisitions than are managers of nonpilot acquiring firms during the *SHO* period compared to the *pre-SHO*

period. Considering that the average likelihood of abandonment of a value-reducing acquisition attempt during our sample period is 4.23%, a 7.95% increase translates into a 187.94% increase in the likelihood of abandoning a proposed value-reducing acquisition during the SHO period compared to the pre-SHO period. These findings indicate that, during the SHO period, when short selling is unimpeded by the uptick rule for pilot firms, managers of pilot firms, in comparison with managers of nonpilot firms, are more sensitive to stock price changes in the decision to abandon proposed value-reducing acquisitions. Further, this provides evidence that even a single short-sale constraint could have significant negative implications on overall market conditions and the informativeness of the overall market for corporate managers.

Third, the coefficient estimate of $CAR \times Pilot \times PostSHO$, β_{11} , is -0.910 with a p-value of 0.41. This result shows that, during the *post-SHO* period, when short selling is equally unimpeded by the uptick rule for both pilot and nonpilot firms, the sensitivity of managers to stock price changes in making the decision to abandon value-reducing acquisition attempts is no different between managers of pilot and nonpilot firms.

As for the control variables, acquisition attempts that are classified as hostile attempts, attempts where a competing acquirer emerges, attempts that have a definitive agreement, or attempts in which the target firm undertakes defensive tactics to fend off an unwanted acquisition attempt are more likely to be abandoned. Acquisition attempts in which the target and acquiring firms are headquartered in the same state are less likely to be abandoned. These findings are all statistically significant with p-values < 0.10.

4.3. Acquisition characteristics

In this section, we examine whether managers are more sensitive to the stock price reaction when short selling is less impeded by regulation and when managers are likely to put more weight

on market prices in their decisions to abandon proposed acquisitions. In particular, we split the sample based on variables that have been shown to proxy for the opacity of an acquisition.²⁰

4.3.1. Focused vs. diversifying acquisitions

We first split the sample based on the type of acquisition. We classify observations into two samples: diversifying and focused acquisition attempts. We define *diversifying acquisition attempts* as those in which the target and acquiring firms are not in the same Fama-French 17 industry. *Focused acquisition attempts* are defined as those in which the target and acquiring firms are in the same Fama-French 17 industry. Aggarwal and Baxamusa (2013) have shown that *diversifying acquisition attempts* are positively correlated with multiple measures of information asymmetry and, thus, we use *diversifying acquisition attempts* as a measure of the opacity of the target to the acquirer. We conjecture that managers are likely to put more weight on market prices when the acquisition is a diversifying acquisition.

We re-estimate the model in equation (2) for each sample. The results are reported in Table V. Column 1 includes all *diversifying acquisition attempts*. The coefficient estimate, β_{10} , in Column 1 is -7.524 (p-value < 0.05). Column 2 includes all *focused acquisition attempts*. The coefficient estimate, β_{10} , in Column 2 is -0.338 (p-value = 0.71). The difference in coefficients between *diversifying* and *focused acquisition attempts* is consistent with managers in acquisition attempts being more sensitive to stock price when short selling is less impeded and when managers put more weight on market prices in deciding whether to abandon proposed acquisitions.

4.3.2. High-tech vs. non-high-tech target firms

We then split the sample based on target firm characteristics. We classify observations into two samples: *high-tech target* and *non-high-tech target*. We define a *high-tech target* as one in

²⁰ We are limited in our selection of variables to proxy for the opacity of the target firm by their availability of variables for non-listed firms.

which the target firm is identified as a high-tech firm by the *SDC* database and the acquirer has a different SIC Code than the target. *High-tech targets* are often young, underfunded companies without prospects for generating cash flow in the near future. For these reasons, they are more difficult to evaluate due to the uncertainty associated with values which rely on future outcomes or developments in uncharted fields (Benou and Madura (2005) and Kohers and Kohers (2000)). Thus, we assume that high-tech targets are more opaque to the acquirer and use *high-tech target* as an indicator to identify opaque targets.

We re-estimate the model in equation (2) for each sample. Table VI reports the results. Column 1 includes all acquisition attempts with a *high-tech target*. The coefficient estimate, β_{10} , in Column 1 is -2.334 (p-value < 0.01). Column 2 includes all acquisition attempts with a *non-high-tech target*. The coefficient estimate, β_{10} , in Column 2 is -1.255 (p-value = 0.27). The difference in the coefficients between acquisition attempts with *high-tech* and *non-high-tech targets* is consistent with the proposition that managers are more sensitive to the stock price reaction when short selling is unimpeded by the uptick rule and when managers are likely to put more weight on market prices in their decisions to abandon (or complete) proposed acquisitions.

4.4. Corporate governance of acquiring firms

In this section, we examine whether managers are more sensitive to their firm's stock price reaction in making their decisions to abandon value-reducing acquisition attempts when short sellers are unimpeded by the uptick test and when the acquiring firm is guided by a higher level of corporate governance. Specifically, we use the *E-Index* (Bebchuk, Cohen, Ferrell (2009)) as a proxy for the quality of corporate governance and separate the sample into terciles. Firms in the bottom tercile are labeled *Strong Shareholder Rights*. Firms in the top tercile are labeled *Weak Shareholder Rights*.

We re-estimate the model in equation (2) for the top and the bottom terciles. Table VII reports the results. Column 1 includes acquiring firms labeled *Strong Shareholder Rights*. The coefficient estimate, β_{10} , is -4.387 (p-value < 0.01). Column 2 includes acquiring firms labeled *Weak Shareholder Rights*. The coefficient estimate, β_{10} , is -1.621 (p-value < 0.05).

Though both coefficients of interest in Columns 1 and 2 are negative and statistically significant, they represent different economic significance when holding the CAR constant at its mean of -3.81%. For acquisition attempts with acquiring firms labeled *Strong Shareholder Rights*, managers of pilot acquiring firms are 2.59 percentage points more likely to abandon the proposed acquisition than are managers of nonpilot acquiring firms. For acquisition attempts by acquiring firms labeled *Weak Shareholder Rights*, managers of pilot acquiring firms are 1.51 percentage points more likely to abandon the proposed acquisition than managers of nonpilot acquiring firms.

These findings are consistent with the proposition that managers of pilot acquiring firms with stronger corporate governance are more sensitive to stock price changes in making the decision to abandon value-reducing acquisition attempts than are managers of nonpilot acquiring firms during the SHO period compared with the pre-SHO period. That is, managers are more sensitive to the stock price changes when short selling is less impeded by regulations and when the acquiring firm is guided by stronger corporate governance.

5. Robustness

The findings thus far are consistent with the proposition that, although the participation of short sellers in stock trading often arouses the ire of managers whose firms become the targets of short selling, managers are more sensitive to stock price changes when short sellers are less impeded in playing a role in the price setting process. In this section, we address the robustness of the results using different specifications of the data and variables. All results reported in tables are presented in the Internet Appendix.

5.1. Delayed response in stock prices due to impeded short sellers

The key premise of our study is that, as informed traders, short sellers' unimpeded involvement in the price setting process makes the change in stock price a more accurate depiction of the value destroyed by proposed value-reducing acquisitions. Consequently, managers are more sensitive to stock price changes when short sellers are less impeded by regulation in the price setting process.

An alternative possibility is that because short sellers are impeded from participating in the price setting process, for nonpilot firms the price response is delayed. Consider an example of two acquisition attempts. Suppose that both acquirers experience a -5% CAR at the announcement of proposed acquisitions. Suppose further that the stock of the first acquiring firm has fewer short sale impediments than the stock of the second acquiring firm. For the second firm whose stock is more short sale impeded, the observed value reduction could be less than the actual value reduction due to lesser involvement of short sellers. In this scenario, the short sale impeded firm could experience a more gradual decline in stock price as the market converges to the actual value destruction following the announcement of the proposed acquisition. Therefore, managers of more short-sale impeded firms, in expectation of further price decline following the announcement, could be more sensitive to the -5% stock price decline in the days immediately surrounding the announcement. If so, the implication is that, during the SHO period, managers of nonpilot acquiring firms would be more sensitive to stock price changes at the announcement of the proposed acquisition attempt in making their decisions to abandon (or complete) the transaction than managers of pilot firms. We find they are not, thereby, ruling out this alternative possibility.

5.2. Post-announcement drift

Our study relies upon the validity of the three-day CAR as an unbiased measure of the value added (destroyed) due to the proposed acquisitions. One concern with this assumption is that there

could be systematic drift in stock returns following acquisition announcements, in particular for firms where short selling is more impeded by regulation. If so, the difference in managers' sensitivity to stock price changes in their decisions to abandon proposed value-reducing acquisitions could be explained by the difference in stock price changes post the announcement of the proposed acquisitions. To address such a concern, we examine the difference in post-announcement drift in abnormal stock returns between pilot and nonpilot firms.

We find that, for acquisition announcements made during the SHO period, there is no statistically nor economically significant difference in cumulative abnormal stock returns (CARs) between pilot and nonpilot firms in the post announcement period up to 20 trading days following the announcement of the proposed acquisitions. In particular, for acquisitions announced during the SHO period, the difference in CARs over the interval of [+2, +20] for acquisitions proposed by pilot and nonpilot firms is 0.08% with a p-value of 0.46. These results suggest that there is no difference in stock returns following the announcement of acquisition attempts by pilot and nonpilot firms.

5.3. Benchmark for value-reducing acquisitions

Our criterion of a CAR less than zero for the identification of value-reducing acquisition attempts implicitly assumes that CARs are measured without error. Since CARs are, indeed, measured with error, some of the attempts classified as value-reducing might be misclassified. To mitigate the concern that our results are due to misclassified value-reducing acquisition attempts, we re-estimate equation (2) including only acquisition attempts with CARs less than -2%. Despite the decrease in sample size, the coefficient estimate of the triple interaction term $CAR \times Pilot \times SHO$ is negative and statistically significant (p-value < 0.05). This estimate indicates that the results of our analysis are not due to potentially misclassified value-reducing acquisition attempts where the CARs are slightly less than zero.

5.4. Acquirers repeatedly abandoning acquisition attempts

Some acquirers enter the sample more than once. Indeed, 67 of the sample firms abandoned value-reducing acquisition attempts three or more times. To mitigate the concern that our results are due to a handful of repeated acquirers where managers are especially sensitive to stock price in making the decision to abandon value-reducing acquisition attempts and their firms just happen to be included in the pilot program, we include only the first acquisition attempt by any acquirer and re-estimate equation (2). Despite the decrease in sample size, the coefficient estimate of the triple interaction term $CAR \times Pilot \times SHO$ is a negative and statistically significant at -2.466 (p-value < 0.10). Thus, the results of our analysis are not due only to acquirers that repeatedly abandon value-reducing acquisition attempts.

5.5. Other robustness tests

We also re-estimate our models using probit and tobit specifications, using a five-day interval (-2, +2) and a seven-day interval (-3, +3) to calculate CAR, and including proposed acquisitions that have a transaction value of at least \$50 million or \$10 million. In all cases, the triple interaction term $CAR \times Pilot \times SHO$ is negative and statistically significant (all p-values < 0.05), and the triple interaction term of $CAR \times Pilot \times PostSHO$ is statistically insignificant (all p-values > 0.46).

6. Using Regulation SHO as an exogenous shock

Concerns about the validity of empirical tests that utilize the SHO experiment have been set forth by Litvak, Black, and Yoo (2020) and Heath, Ringgenberg, Samadi, and Werner (2020). The basis of the concerns is that the causal chain argument fails as there is no evidence that the

Regulation SHO pilot program significantly altered the level of short selling in pilot stocks.²¹ We argue that our interpretation of the results can survive such concerns.

First, our study focuses on managers' perception of the manifest effect of short sellers on stock price and whether that perception of manifest short sales influences managerial actions. We presume that the Regulation SHO pilot program significantly altered managers' perception of short sellers' participation in stock price setting process. To support this presumption, we consider the number of news articles including "short sellers" or "short selling" in the *Wall Street Journal*, *New York Times*, *Washington Post*, and *USA Today* during the Pre-SHO and SHO periods of the Regulation SHO Pilot Program. As illustrated in Figure II, we find the monthly number of news articles including "short sellers" or "short selling" is 12.08 during the pre-SHO period and 18.13 during the SHO period. The more than 50% increase in the media attention given to short selling activities supports our presumption that the Regulation SHO Pilot Program exogenously increased managers' perception of the manifest effect of short sellers on stock price.

Second, Litvak et al. (2020) contend that the SEC erred in the setup of the regulation SHO experiment, and, thus, if researchers find a treatment effect using SHO as an exogenous shock, the effect is likely to be spurious. In particular, "the SEC took the randomly-selected original nonpilot firms; picked the largest third, and suspended the uptick rule for trading in these firms' shares after regular trading hours. Moreover, the Nasdaq national market never applied short-sale restrictions after trading hours." Thereby, Litvak et al. argue that the nonpilot firms in the Regulation SHO

²¹ The causal chain approach sequences the results such that first order effects are tested first. The Romano and Wolf (2005) procedure is then performed resulting in updated critical values with which the second order effects are tested. This continues to the third order effects and so on until all effects have been tested. For Regulation SHO, variables related to the price formation process (i.e., manager's perception of short sellers' involvement) are considered second order outcomes.

program include “partially” pilot firms.²² We acknowledge that the error in the SHO program leads us to misclassify “partially” pilot firms as nonpilot firms. In general, such a misclassification reduces the likelihood of rejecting the null hypothesis. Nevertheless, our tests do reject the null hypothesis.

Third, Heath et al. (2020) comment that, as of the writing of their paper, there were more than 40 papers that use Regulation SHO as a quasi-natural experiment and, combined, these papers examine more than 23 different dependent variables. They argue that the repeated use of a quasi-natural experiment increases the likelihood of false discoveries. They recommend that the critical values for significance tests be adjusted. Using the Heath et al. (2020) adjusted critical values, all of the coefficient estimates of $CAR \times Pilot \times SHO$ continue to be significant at the 0.05 level.

7. Conclusion

In this study we exploit a randomized experiment to examine the cost of restricting short sales in the form of the reduction in market information. That is, we test whether the participation of short sellers in the price setting process increases (or decreases) managers’ sensitivity to stock price changes when making corporate decisions. Our setting is the SEC mandated exemption of short sale uptick tests for a set of firms included in the Regulation SHO pilot program and 756 proposed value-reducing acquisition attempts during the period of 2002-2010. We find that during the pilot program, managers of pilot firms are more sensitive to stock price changes when deciding whether to abandon value-reducing acquisition attempts than nonpilot firms. Further, we find that, during the pre- and post-SHO period, the sensitivity of managers to stock price changes in deciding whether to abandon (or complete) value-reducing acquisition attempts is not different between

²² “The busted randomization went unnoticed by all prior researchers, including the OEA. Indeed, Chester Spatt, the then-SEC Chief Economist who oversaw the experiment, told us that he was not aware that the SEC had created a partly treated group from the original controls.” Litvak, Black, and Yoo (2020)

managers of pilot and nonpilot firms. We further find that managers are more sensitive to stock price changes when short sellers are less impeded in the price setting process and when managers put more weight on market prices in making corporate decisions.

The results of our study suggest that, although the participation of short sellers in stock trading often arouse the criticism of managers whose firms become the targets of short selling, managers are more sensitive to stock price changes when short sellers are less impeded in playing a role in the price setting process. This finding can be generalized to show that despite their dislike towards them, managers believe overall market conditions and the level of information from markets is superior when short sellers are less impeded. This result provides evidence that the imposition of short-sale constraints could have a large effect on market price information. Therefore, when confronted with an episode of heightened market uncertainty, regulators should be aware of the trade-off between the perceived risk-reduction and the effect their action will have on market price information before restricting short selling.

Appendix A: Variable Definitions

Variable	Definition
CAR	Cumulative abnormal return over the (-1,+1) interval surrounding announcements of an acquisition using the market model where the announcement dates are from <i>SDC</i>
Abandonment	One for abandoned acquisition attempts, zero for completed acquisition attempts, as reported by <i>SDC</i>
Compete Dummy	One for acquisition attempts with the emergence of a third party who launches an offer to the same target firm while the original acquisition attempt is pending, zero otherwise, as reported by <i>SDC</i>
Defense Dummy	One for acquisition attempts in which the target firm undertakes defensive tactics to fend off the acquisition attempt, zero otherwise, as reported by <i>SDC</i>
Definitive Agreement Dummy	One for acquisition attempts in which the finalized terms of the deal are agreed upon prior to or on the acquisition announcement date, zero otherwise, as reported by <i>SDC</i>
Diversifying Acquisitions	Acquisition attempts in which the target and acquiring firm are not in the same Fama-French 17 industry
E-Index	The Entrenchment index of Bebchuck, Cohen, and Ferrell (2009)
Focused Acquisitions	Acquisition attempts in which the target and acquiring firm are in the same Fama-French 17 industry
Hostile Dummy	One for acquisition attempts in which the “attitude” of the proposed acquisition is hostile, zero otherwise, as reported by <i>SDC</i>
High-Tech Target	One for acquisition attempts in which the target firm is categorized as high-tech and the acquirer has a different SIC Code than the target, zero otherwise, as reported by <i>SDC</i>
Lockup Dummy	One for acquisition attempts including a lockup of target shares in which the potential acquirer is granted an option to purchase shares at a fixed price even if a competing offer emerges, zero otherwise, as reported by <i>SDC</i>
Ln(Market Cap)	The natural log of the acquirer's market value of equity (in millions of dollars) on the 43 rd trading day prior to the announcement day of the acquisition attempt
Same-State HQ Dummy	One for acquisition attempts where the acquirer and target firms are incorporated in the same state, zero otherwise
Tender Offer Dummy	One for acquisition attempts structured as a tender offer, zero otherwise, as reported by <i>SDC</i>
Pre-SHO	One for acquisition attempts announced between January 1, 2002, and May 1, 2005 (inclusive), zero otherwise
Pilot	One for acquisition attempts where the acquirer was a pilot firm in Regulation SHO, zero otherwise
SHO	One for acquisition attempts announced between May 2, 2005, and August 6, 2007 (inclusive), zero otherwise
Post-SHO	One for acquisition attempts announced between August 7, 2007, and December 31, 2010 (inclusive), zero otherwise
Stock Dummy	One for acquisition attempts financed or partially financed by the acquirer's common stock, zero otherwise
Termination Fee Dummy	One for acquisition attempts that include termination fees that the potential acquirer must pay to the target if the transaction is abandoned, zero otherwise, as reported by <i>SDC</i>

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Figure I. Differences in Abandonment Rates of Value-reducing Acquisition Attempts between Pilot and Nonpilot Firms during the Pre-SHO, SHO and Post-SHO Periods

This figure depicts the differences in abandonment rates between Regulation SHO pilot and nonpilot firms of value-reducing acquisition attempts during the Pre-SHO, SHO and Post-SHO periods of the Regulation SHO Pilot Program. The Pre-SHO period is January 1, 2002 through May 1, 2005. The SHO period is May 2, 2005 through August 6, 2007. The Post-SHO period is August 7, 2007 through December 31, 2010. The sample is from the 2004 Russell 3000 Index as of June 2002. The difference in abandonment rates is calculated as the difference between the abandonment rate for pilot acquirers and the abandonment rate for nonpilot acquirers of proposed value-reducing acquisitions during the time period.

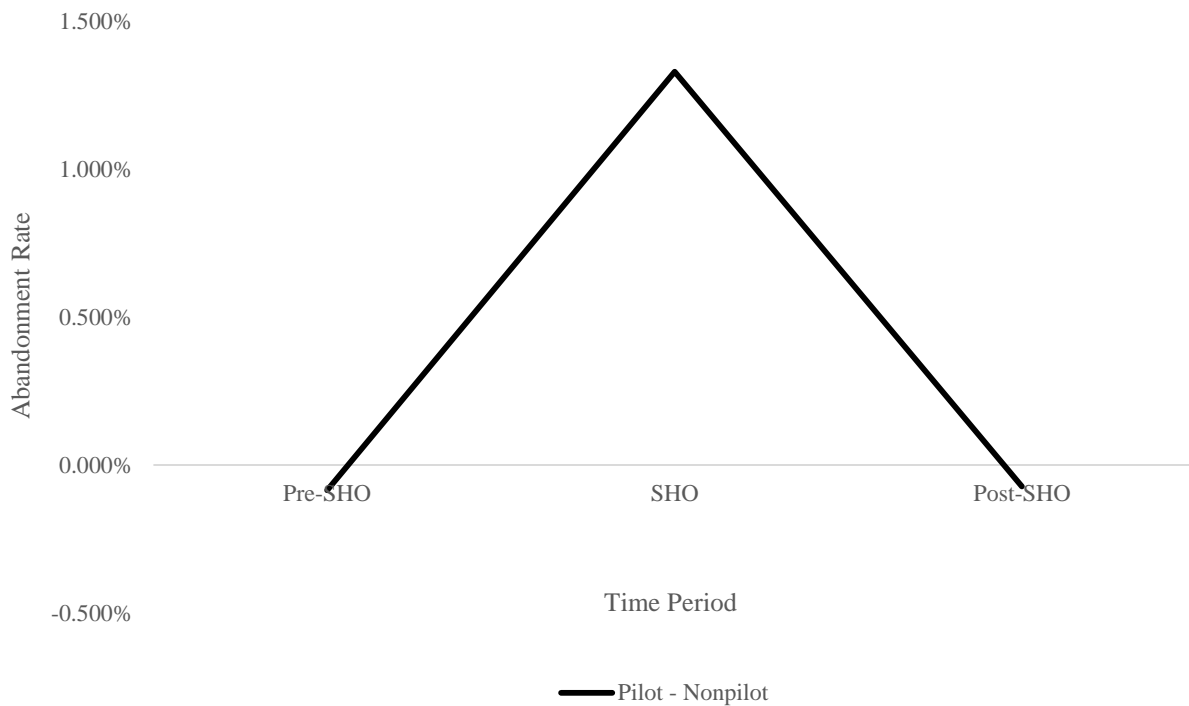


Figure II. Media attention given to short selling activities during the Pre-SHO and the SHO Periods

This figure depicts the monthly number of news articles including “short sellers” or “short selling” in the *Wall Street Journal*, *New York Times*, *Washington Post*, and *USA Today* during the Pre-SHO and SHO periods of the Regulation SHO Pilot Program. The Pre-SHO period is January 1, 2002 through May 1, 2005. The SHO period is May 2, 2005 through August 6, 2007.

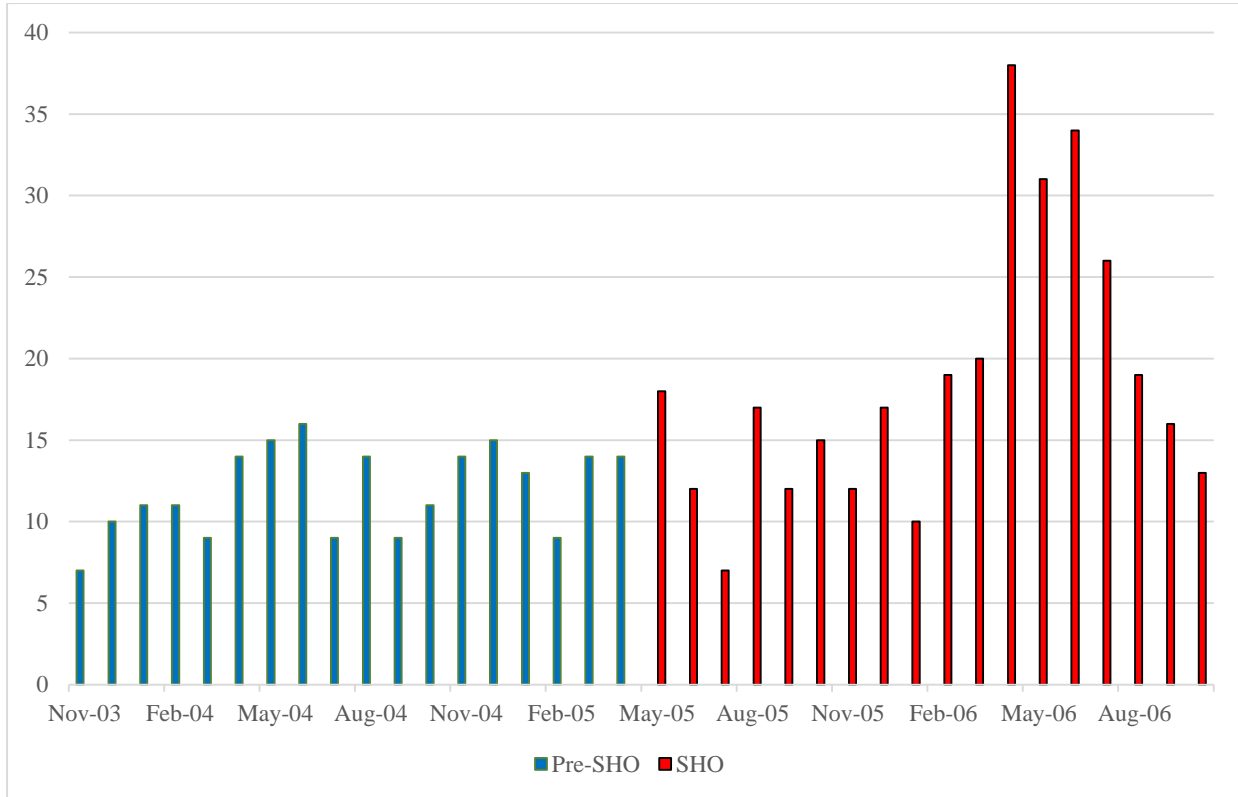


Table I. Sample Selection Procedure

This table presents the sample selection procedure of acquisition attempts obtained from the *Thomson Financial SDC Mergers and Acquisitions* database. The Pre-SHO column includes corporate acquisition attempts announced by pilot and nonpilot firms during January 1, 2002, through May 1, 2005. The SHO column includes corporate acquisition attempts announced by pilot and nonpilot firms during May 2, 2005, through August 6, 2007. The Post-SHO column includes corporate acquisition attempts announced by pilot and nonpilot firms during August 7, 2007, through December 31, 2010.

	Number of Observations		
	Pre-SHO	SHO	Post-SHO
All Acquisition Attempts in <i>SDC</i>	5,610	4,419	4,643
Less: Missing data in <i>SDC</i> ²⁴	2,428	1,916	2,331
Less: Missing data in <i>CRSP</i>	15	6	8
Less: Missing data in <i>Compustat</i>	279	247	211
Less: Acquirer is not designated as a pilot or nonpilot firm	891	819	990
Less: Acquirer owns more than 50% of target at announcement	29	13	13
Less: Acquirer seeks to own less than 100% of target	164	89	95
Less: Transaction value less than \$100 million	1,232	775	539
Less: Acquisition attempt is not value-reducing	293	295	238
Value-reducing Acquisition Attempts	279	259	218

²⁴ Missing variables include the percentage of target shares that the acquirer owns prior to the proposed acquisition, percentage of shares sought by the acquirer, transaction value, and the final transaction status (i.e., completed or withdrawn).

Table II. Distribution of Value-reducing Acquisition Attempts by SHO Program Pilot and Nonpilot Firms across Years and Industries

This table presents the distribution of the sample of value-reducing acquisition attempts across years in Panel A and across industries in Panel B for Regulation SHO pilot and nonpilot acquirers over the period of January 1, 2002, through December 31, 2010, obtained from the *Thomson Financial SDC Mergers and Acquisitions* database.

Panel A: Distribution of acquisition attempts across years

Year	Pilot Acquirers	Nonpilot Acquirers	% Pilot Acquirers
2002	15	39	27.78%
2003	21	49	30.00%
2004	46	74	38.33%
2005	39	78	33.33%
2006	46	65	41.44%
2007	33	65	33.67%
2008	24	48	33.33%
2009	14	25	35.90%
2010	31	44	41.33%
Total	269	487	35.58%

Panel B: Distribution of acquisition attempts across industries

Industry	N	% of Acquisitions	Pilot Acquirers	% Pilot Acquirers
Energy	65	8.60%	31	32.29%
Materials	23	3.04%	8	25.81%
Industrials	73	9.66%	23	23.96%
Consumer Discretionary	42	5.56%	16	27.59%
Consumer Staples	17	2.25%	8	32.00%
Health Care	114	15.08%	38	25.00%
Financials	139	18.39%	54	27.98%
Information Technology	167	22.09%	54	24.43%
Telecommunication Services	28	3.70%	7	20.00%
Utilities	19	2.51%	8	29.63%
Real Estate	69	9.13%	22	24.18%
Total	756	100.00%	269	35.58%

Table III. Descriptive Statistics

This table presents descriptive statistics for value-reducing acquisition attempts by the Regulation SHO pilot and nonpilot firms obtained from the *Thomson Financial SDC Mergers and Acquisitions* database over the period of January 1, 2002, through December 31, 2010. Panels A and B give the means and medians for acquirers and transaction characteristics, respectively, both for the full sample and for subsamples of only pilot and only nonpilot acquirers. All variables are defined in Appendix A. Statistical tests for differences in means and medians for each characteristic for pilot and nonpilot acquirers are also presented. ***, **, and * indicate significance at 1%, 5%, and 10%, respectively.

	Full Sample		Pilot Acquirers		Nonpilot Acquirers		Difference	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median
<i>Panel A. Acquirer and acquisition characteristics</i>								
Acquirer Size (in \$ millions)	17,477.24	3,396.49	13,173.03	3,334.04	19,854.72	3,430.69	-6681.69**	-96.65
Equity Market-to-Book Ratio	2.58	2.41	3.24	2.42	2.21	2.40	1.03**	0.02
Log(Firm Age)	2.94	3.00	2.91	2.94	2.95	3.00	-0.05	-0.05
Transaction Value (in \$ millions)	1,785.32	289.20	2,104.46	300.00	1,609.04	275.00	495.42	25.00
CAR (%)	-3.81	-2.22	-4.14	-2.59	-3.63	-2.13	-0.52	-0.46*
<i>Panel B: Percentage of acquisition attempts with the following characteristics (in %)</i>								
Defense Dummy	1.06	-	1.49	-	0.82	-	0.67	-
Compete Dummy	2.51	-	4.09	-	1.64	-	2.45*	-
Hostile Dummy	0.79	-	0.74	-	0.82	-	-0.08	-
Tender Offer Dummy	3.57	-	4.09	-	3.29	-	0.80	-
Lockup Dummy	0.53	-	0.74	-	0.41	-	0.33	-
Termination Fee Dummy	31.08	-	31.60	-	30.80	-	0.80	-
Stock Dummy	62.43	-	65.06	-	60.99	-	4.07	-
Same State HQ Dummy	26.46	-	30.11	-	24.44	-	5.68*	-
Definitive Agreement Dummy	95.37	-	94.05	-	96.10	-	-2.05	-

Table IV. Acquisition Abandonment during the Pre-SHO, SHO, and Post-SHO Periods

This table presents estimates of a triple difference analysis in a linear probability model of acquisition abandonment. The sample includes 756 value-reducing acquisition attempts by the Regulation SHO pilot and nonpilot firms announced over the period of January 1, 2002, through December 31, 2010. The dependent variable is an indicator that is given the value of one for abandoned acquisition attempts and zero for completed attempts. An acquisition attempt is classified as Pilot if the acquirer was designated as a pilot firm during the Regulation SHO pilot program and is designated as SHO or Post-SHO based on the announcement date of the acquisition attempt. Variables are defined in Appendix A. All regressions control for year and industry fixed effects. The coefficient estimates of the constant, year, and industry dummies are omitted for brevity. Standard errors are clustered by industry and t-statistics are reported in brackets. ***, **, and * indicate significance at 1%, 5%, and 10%, respectively.

	Dependent Variable: Abandonment (1,0)	
	(1)	(2)
CAR x Pilot x SHO		-2.087*** [-2.67]
CAR x Pilot x Post-SHO		-0.910 [-0.82]
CAR	-0.582*** [-2.71]	-1.645*** [-5.53]
Pilot		-0.001 [-0.05]
SHO		0.032 [1.60]
Post-SHO		0.008 [0.33]
CAR x Pilot		0.720 [0.87]
CAR x SHO		1.850*** [4.96]
CAR x Post-SHO		1.820*** [5.00]
Pilot x SHO		-0.041 [-1.60]
Pilot x Post-SHO		0.006 [0.13]

Table IV. Continued

	Dependent Variable: Abandonment (1,0)	
	(1)	(2)
Defense Dummy	0.353*** [2.76]	0.371*** [3.25]
Compete Dummy	0.334*** [4.64]	0.342*** [4.35]
Hostile Dummy	0.518** [2.22]	0.533** [2.40]
Tender Offer Dummy	-0.029 [-0.38]	-0.030 [-0.47]
Lockup Dummy	-0.129 [-0.49]	-0.164 [-0.68]
Termination Fee Dummy	0.004 [0.42]	0.004 [0.44]
Stock Dummy	0.010 [0.92]	0.009 [0.89]
Ln(Market Cap)	-0.006 [-1.08]	-0.006 [-1.13]
Same State HQ Dummy	-0.023*** [-3.13]	-0.030*** [-3.72]
Definitive Agreement Dummy	0.074*** [3.88]	0.070*** [3.46]
Industry Fixed Effects	Yes	Yes
Year Fixed Effects	Yes	Yes
Observations	756	756
Adj. R ²	0.2397	0.2699

Table V. Acquisition Abandonment during the Pre-SHO, SHO, and Post-SHO Periods by the Type of Acquisitions

This table presents estimates of a triple difference analysis in a linear probability model of acquisition abandonment. The sample includes 756 value-reducing acquisition attempts by the Regulation SHO pilot and nonpilot firms announced over the period of January 1, 2002, through December 31, 2010. The dependent variable is an indicator that takes the value of one for abandoned acquisition attempts and zero for completed attempts. An acquisition attempt is classified as Pilot if the acquirer was designated as a pilot firm during the Regulation SHO pilot program and is designated as SHO or Post-SHO based on the announcement date of the acquisition attempt. The sample is split based on whether the acquisition attempt is categorized as a diversifying or focused acquisition attempt. A diversifying acquisition attempt is defined as one in which the target and acquiring firm are not in the same Fama-French 17 industry. Variables are defined in Appendix A. All regressions control for year and industry fixed effects. The coefficient estimates of the constant, year, and industry dummies are omitted for brevity. Standard errors are clustered by industry and t-statistics are reported in brackets. ***, **, and * indicate significance at 1%, 5%, and 10%, respectively.

	Dependent Variable: Abandonment (1,0)	
	Diversifying Acquisition Attempts	Focused Acquisition Attempts
CAR x Pilot x SHO	-7.524** [-2.37]	-0.338 [-0.37]
CAR x Pilot x Post-SHO	-2.310 [-1.66]	1.683 [1.63]
CAR	-1.995* [-1.67]	-1.668*** [-4.30]
Pilot	0.050 [1.09]	-0.019 [-0.62]
SHO	-0.035 [-0.31]	0.030 [1.24]
Post-SHO	-0.011 [-0.11]	-0.036 [-1.17]
CAR x Pilot	2.000 [1.47]	-1.178 [-1.39]
CAR x SHO	1.959 [1.62]	1.688*** [4.03]
CAR x Post-SHO	2.232* [1.79]	1.395*** [3.34]
Pilot x SHO	-0.150 [-1.50]	-0.005 [-0.19]
Pilot x Post-SHO	-0.093 [-1.46]	0.060 [1.14]
Industry Fixed Effects	Yes	Yes
Year Fixed Effects	Yes	Yes
Observations	197	559
Adj. R ²	0.1334	0.1714

Table VI. Acquisition Abandonment during the Pre-SHO, SHO, and Post-SHO Periods by the Type of Target

This table presents estimates of a triple difference analysis in a linear probability model of acquisition abandonment. The sample includes 756 value-reducing acquisition attempts by the Regulation SHO pilot and nonpilot firms announced over the period of January 1, 2002, through December 31, 2010. The dependent variable is an indicator that takes the value of one for abandoned acquisition attempts and zero for completed attempts. An acquisition attempt is classified as Pilot if the acquirer was designated as a pilot firm during the Regulation SHO pilot program and is designated as SHO or Post-SHO based on the announcement date of the acquisition attempt. The sample is split based on whether the target firm is categorized as high-tech by the *SDC* database along with the acquirer having a different SIC Code than the target. Variables are defined in Appendix A. All regressions control for year and industry fixed effects. The coefficient estimates of the constant, year, and industry dummies are omitted for brevity. Standard errors are clustered by industry and t-statistics are reported in brackets. ***, **, and * indicate significance at 1%, 5%, and 10%, respectively.

	Dependent Variable: Abandonment (1,0)	
	High-Tech Target	Non-High-Tech Target
CAR x Pilot x SHO	-2.334*** [-3.22]	-1.255 [-1.11]
CAR x Pilot x Post-SHO	-1.943 [-1.11]	0.338 [0.26]
CAR	-1.126*** [-2.88]	-1.731*** [-3.27]
Pilot	-0.022 [-0.25]	0.021 [0.65]
SHO	-0.062 [-0.78]	0.034 [1.53]
Post-SHO	-0.115 [-0.88]	0.000 [0.01]
CAR x Pilot	0.725 [0.82]	0.006 [0.01]
CAR x SHO	0.856 [1.23]	1.920*** [3.88]
CAR x Post-SHO	1.204*** [3.39]	1.866*** [2.80]
Pilot x SHO	-0.030 [-0.40]	-0.060** [-2.12]
Pilot x Post-SHO	-0.050 [-0.42]	0.018 [0.35]
Industry Fixed Effects	Yes	Yes
Year Fixed Effects	Yes	Yes
Observations	203	553
Adj. R ²	0.1048	0.1614

Table VII. Acquisition Abandonment during the Pre-SHO, SHO, and Post-SHO Periods by the Corporate Governance of the Acquirer

This table presents estimates of a triple difference analysis in a linear probability model of acquisition abandonment. The sample includes 756 value-reducing acquisition attempts by the Regulation SHO pilot and nonpilot firms announced over the period of January 1, 2002, through December 31, 2010. The dependent variable is an indicator that is given the value of one for abandoned acquisition attempts and zero for completed attempts. An acquisition attempt is classified as Pilot if the acquirer was designated as a pilot firm during the Regulation SHO pilot program and is designated as SHO or Post-SHO based on the announcement date of the acquisition attempt. Column (1) includes acquisition attempts where the acquiring firm has *Strong Shareholder Rights* based on their *E-Index* and Column (2) includes acquisition attempts where the acquiring firm has *Weak Shareholder Rights* based on their *E-Index*. Variables are defined in Appendix A. All regressions control for year and industry fixed effects. The coefficient estimates of the constant, year, and industry dummies are omitted for brevity. Standard errors are clustered by industry and t-statistics are reported in brackets. ***, **, and * indicate significance at 1%, 5%, and 10%, respectively.

	Dependent Variable: Abandonment (1,0)	
	Strong Shareholder Rights	Weak Shareholder Rights
CAR x Pilot x SHO	-4.387*** [-4.03]	-1.621** [-2.26]
CAR x Pilot x Post-SHO	-0.935 [-1.55]	-0.207 [-0.49]
CAR	-2.719*** [-7.74]	-2.007*** [-5.95]
Pilot	0.068 [1.31]	0.065 [1.07]
SHO	-0.060 [-0.48]	0.012 [0.22]
Post-SHO	-0.151 [-1.47]	-0.053 [-1.03]
CAR x Pilot	2.486*** [6.50]	1.704*** [3.06]
CAR x SHO	2.758*** [7.85]	2.167*** [5.80]
CAR x Post-SHO	1.917*** [3.93]	2.069*** [5.16]
Pilot x SHO	-0.115** [-2.15]	-0.077 [-1.13]
Pilot x Post-SHO	0.000 [0.00]	-0.056 [-0.88]
Industry Fixed Effects	Yes	Yes
Year Fixed Effects	Yes	Yes
Observations	246	253
Adj. R ²	0.1883	0.1918