

JANUARY 29, 2020 | NUMBER 199

## Short-Sale Constraints and Stock Price Crash Risk

### Causal Evidence from a Natural Experiment

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**A**ncedotal evidence often claims that short-selling of stocks triggers financial crises or exacerbates marketwide stock price crash risk. Therefore, short sellers are often treated as scapegoats and held responsible for the occurrence of stock price crashes, especially during periods of financial market turmoil. This observation is one important reason why short sales are often banned when the market is volatile—for example, the United States banned short sales in 2008.

We argue that short-sale constraints do not reduce, and in fact exacerbate, the likelihood of an abrupt, large-scale decline in stock prices (stock price crash risk). Lifting of short-sale constraints reduces the likelihood of stock price crashes because short sellers serve as a monitoring function and provide stock market feedback. Because most of the short sellers are sophisticated institutional investors and thus have the ability to detect bad news promptly or to gain privileged access to private information, they can help expedite the price-discovery process and improve the informational efficiency of stock prices via their shorting activities. By facilitating a timelier incorporation of information (especially negative news) into market prices, their trading activities can deter or slow down the within-firm hoarding of bad news, which in turn decreases a firm's stock price crash risk.

In 1977, economist Edward M. Miller Jr. theorized that when investors' beliefs about a firm's value are heterogeneous and short sales are forbidden, the firm's share price is inflated. In efficient markets, observed market prices fully reflect publicly available information. Short sellers, who are able to identify overvalued stocks based on their private information, should earn abnormal returns when the prices of currently overvalued stocks are corrected later through their shorting activities. However, because of market frictions (such as short-sale constraints), outside investors are unable to observe the (negative) information short sellers have. Since Miller's seminal research on short sales was published, many economists have attempted to address the consequences of the equity overvaluation problem induced by short-sale constraints. Because of these constraints, pessimistic investors are sidelined from the market until market declines are flushed out when hidden (negative) information is revealed. This triggers an abrupt, large-scale decline in stock prices, thereby leading us to more negatively skewed returns.

Most of the theoretical studies predict a positive relation between short-sale constraints and stock price crash risk. However, the empirical findings are mixed. Endogeneity problems are the most important obstacle to reaching a consensus on the role that short sellers play in the stock market. A few studies attempt to alleviate concerns about

endogeneity by studying short-sale regulations among countries or examining the short-sale regulation changes in mainland China and Hong Kong. However, they still fail to reach a consensus because of vast differences in institutions, investor protection, and law enforcement among countries.

Our research exploits the Securities and Exchange Commission's Regulation SHO (RegSHO) pilot program as a natural experiment in which to examine the causal impact of short sales (i.e., an increase in short sales due to the temporary removal of short-sale constraints) on stock price crash risk. Announced in 2004, RegSHO concerns short-sale activities in U.S. equity markets. It contained the Rule 202T pilot program, in which one-third of the largest stocks, ranked by trading volume within each exchange, were randomly selected into a pilot group in order to test the impact of removing short-sale constraints. During the period from May 2, 2005, to August 6, 2007, the pilot stocks were exempted from the uptick rule, which prohibits the short sale of stocks except when the price of the stock is increasing.

RegSHO provides us with a natural experimental setting in which to investigate the role of short sales in a capital market. First, the pilot program initiated a significant decrease in the cost of shorting among the pilot stocks, suggesting that the use of this regulation as an exogenous shock to short-sale activities is economically meaningful.

Second, under RegSHO, the list of stocks in the pilot group was randomly selected from among the exchanges, and thus the program created two comparable groups: the treatment sample of firms affected by RegSHO and the control sample of firms unaffected by RegSHO.

Third, the RegSHO pilot program had specific start and end dates. The known end date allows us to investigate whether the effect of lifting short-sale constraints is reversed when constraints are reimposed, which can serve as a validity test.

Our analysis reveals that increased short sales of the pilot stocks induced by RegSHO reduced stock price crash risk. In other words, relaxing or removing short-sale constraints, which increases shorting activities, decreases the likelihood of a stock price crash occurrence.

In addition, we also study the channels through which short-sale constraints affect crash risk. First, we contend that short sales play an essential role in alleviating the information asymmetry between inside managers and outside

investors. Short sellers engage in gathering private information, particularly about bad news or unfavorable performance, and increase the cost to managers of bad-news hoarding. In this process, short sellers can deter managers from hiding bad news or information about unfavorable performance. When the information asymmetry is high, stock prices may not reflect all available information, and some stocks may be overvalued. Short sellers are interested in those overvalued stocks and take a short position on such stocks to make trading profits. Once a short position is taken, the overvalued stocks will return to their fundamental value. As such, more-intense shorting activities can contribute to lowering the likelihood of stock price crashes, thereby leading us to observe an inverse relation between short sales and the risk of a stock price crash. We expect that this inverse relation is more pronounced for firms with a weaker information environment. As existing literature shows, management intending to hoard more bad news is more prone to crash risk. When short-sale constraints are removed and thus external monitoring by short sellers becomes more intense, managers from opaque firms are less able to hide unfavorable information. The consequence is that the stock price crash risk decreases due to the reduction in bad-news hoarding.

Secondly, we contend that lifting short-sale constraints reduces distortions in corporate investment, in particular by reducing an overinvestment problem. Overvaluation, due to short-selling constraints, can incentivize managers to engage in overinvestment by artificially reducing the firm's cost of equity, which increases the probability of stock price crashes. Short sales can ease the corporate overinvestment problem and thus reduce the likelihood of stock price crashes. Our findings confirm this hypothesis. We find that the short-sale impact on reducing crash risk is more pronounced for firms that are more likely to overinvest.

#### **NOTE:**

This research brief is based on Xiaohu Deng, Lei Gao, and Jeong-Bon Kim, "Short-Sale Constraints and Stock Price Crash Risk: Causal Evidence from a Natural Experiment," *Journal of Corporate Finance*, forthcoming, [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2782559](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2782559).