

It's SHO Time! Short-Sale Price Tests and Market Quality

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ABSTRACT

We examine the effects of the Securities and Exchange Commission (SEC)-mandated temporary suspension of short-sale price tests for a set of Pilot securities. While short-selling activity increases both for NYSE- and Nasdaq-listed Pilot stocks, returns and volatility at the daily level are unaffected. NYSE-listed Pilot stocks experience more symmetric trading patterns and a slight increase in spreads and intraday volatility after the suspension while there is a smaller effect on market quality for Nasdaq-listed Pilot stocks. The results suggest that the effect of the price tests on market quality can largely be attributed to distortions in order flow created by the price tests themselves.

REGULATION SHO (REG SHO) PROVIDES a new regulatory framework governing short-selling of securities in U.S. equity markets. The rules were passed on September 7, 2004 and became effective on January 3, 2005.¹ Reg SHO is intended to establish uniform locate and delivery requirements, create uniform marking requirements for sales of all equity securities, and establish a procedure to temporarily suspend the “provisions of Rule 10a-1 under the Securities Exchange Act of 1934 and any short-sale price test of any exchange or national securities association for short sales of certain securities for certain time periods” in order to “evaluate the overall effectiveness and necessity of such restrictions.”²

In this paper, we study the effect on market quality of the Securities and Exchange Commission's (SEC) mandated temporary suspension of short-sale price tests for a set of designated pilot securities (Rule 202T—Pilot Program).³

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¹ Securities Exchange Act Release No. 50103 (July 28, 2004), 69 FR 48008 (August 6, 2004).

² Division of market regulation: Responses to frequently asked questions concerning regulation SHO (January 4, 2004).

³ Securities Exchange Act Release No. 50104 (July 28, 2004), 69 FR 48032 (August 6, 2004).

On May 2, 2005,⁴ roughly 1,000 U.S. stocks—so called Pilot stocks—began to trade without short-sale price tests (Uptick test for the NYSE and bid price test for Nasdaq). These stocks were selected by the SEC to represent a broad cross-section of the U.S. equity market. The Pilot stocks were drawn from the Russell 3000 index, comprising every third stock ranked by volume. We label the remaining Russell 3000 index securities Control stocks. The experiment was designed by the SEC to investigate whether Rule 10a-1, NYSE's Uptick rule, and Nasdaq's bid price test affect market quality, and to develop uniform price tests if such rules were deemed necessary going forward. The temporary suspension was originally set to expire on April 28, 2006, but was extended to August 6, 2007.⁵

The extent to which specific price tests are likely to have an effect depends on what fraction of overall trading activity is represented by short sales. Recent empirical evidence shows that short-selling is much more common than most market observers previously imagined. For example, Boehmer, Jones, and Zhang (2008) find that short sales represent 13% of NYSE (SuperDOT) share volume during 2000 to 2004. Even more striking, Diether, Lee, and Werner (2008) find that short sales represent 31% of share volume for Nasdaq-listed stocks and 24% of share volume for NYSE-listed stocks in 2005. Hence, there is a potential for short-sale price tests to affect price levels, volatility, as well as high-frequency measures of market quality. Short-sale price tests may affect price levels if they create frictions that are strong enough to limit the extent to which prices reflect the views of pessimists, that is, the investors who think stocks are overvalued (e.g., Miller (1977) and Diamond and Verrecchia (1987)). They may also reduce volatility if they make it more difficult for short-sellers to engage in downward manipulation of stock prices. Finally, short-sale price tests may affect the mix of passive and active trading strategies employed by short-sellers, which in turn could affect market quality measures such as spreads, depth, and order imbalances.

Restrictions on short-selling activity were introduced in the United States in the 1930s following the stock market crash of 1929. Jones (2003) shows that short-selling in NYSE-listed stocks was more difficult after the introduction of shorting restrictions. He also finds that these events were associated with positive abnormal returns, consistent with the notion that optimists have more influence on prices in the presence of short-sale restrictions. By contrast, shorting restrictions had no effect on the volatility of returns. Based on the historical experience, we predict that stock prices will fall on the announcement of a suspension of short-sale price tests, or at least after the suspension itself. However, we find no evidence that NYSE or Nasdaq Pilot stocks experience significantly lower average returns compared to their respective Control samples around

⁴ The Pilot Program was originally intended to commence on January 3, 2005, but in response to information received by the SEC from market participants, the Pilot was postponed until May 2, 2005 (Securities and Exchange Act Release No. 50747 (November 29, 2004), 69 FR 70480 (December 6, 2004)).

⁵ Securities and Exchange Act Release No. 53684 (April 20, 2006).

the announcement of the Pilot Program (July 28, 2004) or on the date the Pilot Program became effective (May 2, 2005). Moreover, we do not detect any change in daily volatility measures for Pilot compared to Control stocks. Hence, it appears that there is no significant effect of suspending short-sale price tests on price levels or volatility at the daily frequency.

The effect of short-selling on high-frequency market quality measures depends on the specific form of the price test that each market uses. NYSE uses a tick test to determine whether a short sale is permitted (NYSE Rule 440B, also called the Uptick rule). Consequently, a short sale is only allowed on a plus tick or on a zero tick, where the most recent price change preceding the trade was a plus tick (called a zero-plus tick).⁶ The way the specialist adjusts orders to ensure compliance with the Uptick rule means that short-sellers effectively become liquidity providers. As a result, we expect to see a disproportionate amount of limit orders on the offer side of the market, inflating the depth at the ask quotes and a disproportionate amount of trades executing above the midquote, creating a buy order imbalance. As suggested by Jones (2003), these trading strategies may also produce narrower quoted (and possibly effective) spreads. Finally, we argue that this bias toward passive short-sale order strategies may dampen short-term volatility.

Nasdaq uses a bid price test to determine whether a short sale is allowed (Nasdaq Rule 3350). Short sales in Nasdaq National Market Securities (NM) are not allowed at or below the (inside) bid when the current inside bid is at or below the previous inside bid. We argue that the bid price test permits short-sellers to use a more natural mix of marketable limit order and limit order strategies than the NYSE's Uptick rule. Moreover, Archipelago and INET, who together are responsible for a significant fraction (over 40%) of share volume in Nasdaq-listed stocks, did not enforce the bid price test during the sample period. As a result, we predict that the effect of short-selling activity on market quality will be smaller for Nasdaq-listed stocks.

We find that the temporary suspension of short-sale price tests affects short-selling activity for both NYSE- and Nasdaq-listed securities. For NYSE-listed stocks, there is no significant change in short-sale share volume or short interest, but short-sale trade size decreases significantly and short-sale trade frequency increases significantly for Pilot relative to Control stocks. In other words, NYSE short-sellers split their orders more as they switch from passive to more active trading strategies. Moreover, short sales relative to share volume on the NYSE increase significantly after the suspension of the price tests. For Nasdaq-listed stocks, both short-sale share volume and the short-sale frequency increase significantly for Pilot relative to Control stocks. However, there is no evidence of increased order splitting for Nasdaq Pilot stocks. In sum, short sales relative to share volume increase significantly for Pilot relative to Control

⁶ Types of short sales that are exempt from short-sale rules include certain odd-lot short-sales, certain sales by registered specialists or market makers, certain sales necessary to equalize prices on a nonprimary market with the primary market, certain sales in special arbitrage accounts, and certain sales by underwriters (see SEC Rule 10a-1, section e (3), (4), (5), (6), (7), (8), (9), and (10)).

stocks. Thus, it appears that suspension of NYSE's Uptick rule and Nasdaq's bid price test makes it somewhat easier to execute short sales.

We argue that NYSE's Uptick rule causes short-sellers to engage in more passive trading strategies, which results in narrower spreads, lower volatility, higher ask depth, and a disproportionate amount of order flow executing above the midquote. Thus, we predict that the suspension of the Uptick rule will significantly reduce the quote and order flow asymmetries, and that it may result in wider spreads and higher short-term volatility. We also argue that the impact of short sales on Nasdaq is smaller for two reasons: The bid price test is not very restrictive, and Archipelago and INET permitted unfettered short sales in Nasdaq-listed stocks. Consequently, we predict that the suspension of the bid price test will have more limited impact on market quality for Nasdaq Pilots.

We find strong evidence supporting our hypotheses. The relative bid depth increases significantly for NYSE-listed Pilot stocks but there is no significant change for Control stocks. The buy order imbalance declines significantly for Pilot stocks while it actually increases significantly for Control stocks. Relative to Control stocks, NYSE-listed Pilot stocks experience a slight but statistically significant increase in both quoted and effective spreads. Trade-to-trade returns are significantly more volatile for NYSE Pilot relative to Control stocks after May 2, 2005. However, there is no evidence of a disproportionate increase in downside volatility. Lower-frequency intraday volatility measures (at 5, 15, and 30 minutes) suggest that the increase in volatility for Pilot stocks relative to Control stocks disappears as returns are measured over longer intervals (30 minutes). Finally, variance ratio tests suggest that short-term volatility increases relative to longer-term volatility for NYSE Pilot stocks compared to Control stocks.

As predicted, we find smaller differences between the changes in market quality measures such as quote asymmetries and spreads for Nasdaq-listed Pilot stocks relative to Control stocks. There is also no significant change in trade-to-trade volatility, or in midquote volatility at lower frequencies (5, 15, and 30 minutes), for Nasdaq-listed Pilot stocks relative to Control stocks. These findings are confirmed by variance ratio tests, which show no significant changes for Nasdaq-listed Pilot stocks relative to Control stocks.

Throughout the paper, we conduct cross-sectional tests to examine how the suspension of price tests affects less liquid stocks. While we do find evidence that the magnitude of the effects of the suspension of the Uptick rule are in some cases larger for less liquid NYSE-listed stocks, we attribute this mostly to the fact that the distortions in order flow are more severe for stocks with wider spreads and lower price. The evidence on how suspending the bid price test affects small, less liquid Nasdaq-listed stocks is more mixed.

Our paper proceeds as follows. In Section I, we outline the short-sale rules for the NYSE and Nasdaq and develop our testable hypotheses. We describe the data in Section II. We test whether the level of short sales changed significantly between the period before and after the suspension of price tests in Section III. In Section IV, we examine the effect of suspension of price tests on daily

returns and volatility. Section V is devoted to testing for changes in market quality measures. In Section VI, we investigate whether intraday volatility increased for Pilot stocks. We discuss robustness tests in Section VII. Section VIII concludes. A short epilogue can be found in Section IX.

I. Testable Hypotheses

In this paper we first test whether the actual form of price tests used by NYSE or Nasdaq constrain short-selling activity. Angel (1997) and Alexander and Peterson (1999) conclude that the Uptick rule impedes short-selling activity on the NYSE by examining the fill rate of short-sale orders.⁷ We provide an alternative test of the effect of the Uptick rule by examining the overall volume of short-selling after price tests are lifted. In addition, we test whether Nasdaq's bid price test impedes short-selling. If the applicable short-sale rules are restricting market participants from executing their desired trades, we predict that short-selling activity for Pilot stocks will increase significantly after the suspension of the price tests. Of course, there could be a secular trend in short-selling activity, so we need to express our hypothesis relative to what happens to Control stocks, for which there is no change in rules. Hence, our first hypothesis is that the suspension of price tests will increase short-selling activity in Pilot stocks relative to Control stocks.

Much of the empirical short-selling literature focuses on how short-sale constraints affect stock prices and returns. Theoretical papers such as Miller (1977), Harrison and Kreps (1978), Morris (1996), Scheinkman and Xiong (2003), and Duffie, Gârleanu, and Pedersen (2002) develop models in which the presence of short-sale constraints and opinion divergence leads to overpricing and abnormally low subsequent returns. Empirically, the previous literature finds that stocks are sometimes expensive to short and that there is a link between short-selling and subsequent returns. Using data from April 2000 through September 2001, D'Avolio (2002) reports that about 9% of the stocks in his sample have loan fees greater than 1% per year. Jones and Lamont (2002), Ofek, Richardson, and Whitelaw (2004), and Cohen, Diether, and Malloy (2007) find that subsequent average returns are low for stocks that are expensive to short. Figlewski and Webb (1993), Dechow et al. (2001), Desai et al. (2002), Boehmer, Jones, and Zhang (2008), Diether, Lee, and Werner (2008), and Asquith, Pathak, and Ritter (2005) find a negative relation between short-selling activity and subsequent returns. If short-sale price tests help push stock prices above fundamental value, then suspending them should result in negative returns. Hence, our second hypothesis is that the suspension of price tests will be associated with lower returns for Pilot stocks relative to Control stocks.

The price tests for listed stocks were developed by the SEC in the 1930s to prevent short sales from executing in declining markets (see, e.g., Jones (2003)).

⁷ Ferri, Christophe, and Angel (2004) argue that the Nasdaq bid price test is not effective and does not curtail short-selling activity.

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