



Information in short selling: Comparing Nasdaq and the NYSE

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ABSTRACT

This study directly compares the level and return predictability of short selling for NYSE stocks to a matched sample of Nasdaq stocks. When considering trading that executes on all exchanges, we document that the Nasdaq has greater levels of short selling, relative to total trading activity, than the NYSE. However, Nasdaq has less relative short activity than the NYSE when considering short selling that executes on the primary exchange. When comparing the contrarian trading behavior and the return predictability of short sellers, we show that Nasdaq short sellers are more contrarian in contemporaneous and past returns and better at predicting negative returns than NYSE short sellers. These results are robust in each trade-size category.

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1. Introduction

Research documents differences in the trading behavior of securities listed on the New York Stock Exchange (NYSE) and those on the National Association of Securities Dealers (Nasdaq), including differences in trading costs between the NYSE and Nasdaq (Huang & Stoll, 1996, in a 1/8th environment; Bessembinder, 1999, in a 1/16th environment; and Bessembinder, 2003, in a decimal environment). In addition, research shows that there are differences between NYSE and Nasdaq stocks in adverse selection (Affleck-Graves, Hegde, & Miller, 1994) and information-based trading (Heidle & Huang, 2002), as well as reductions in order flow fragmentation when stocks move from Nasdaq to the NYSE (Bennett & Wei, 2006).

Although not directly compared, research on short selling shows that Nasdaq stocks normally have higher levels of short selling than NYSE stocks (Alexander & Peterson, 2008; Diether, Lee, & Werner, 2009a,b; Edwards & Hanley, 2008). The purpose of this study is to directly compare short selling of NYSE stocks to Nasdaq stocks using various matched samples in order to document any differences in short-selling behavior between the major exchanges. This investigation is warranted by recent findings in two streams of literature. First, Diether et al. (2009a) and Boehmer and Wu (2008) find that short sellers add to the informational efficiency of prices. Second, Theissen (2000) reports that prices are more informationally efficient on call and continuous auction

markets than on dealer markets indicating that Nasdaq stock prices may deviate from their true value more than NYSE-listed stocks, thus attracting more short-selling activity. We explore the level of short selling on the NYSE and Nasdaq in order to bridge these two streams of literature. Further, we examine differences in the contrarian trading behavior and return predictability of short sellers on the major exchanges.

Diether et al. (2009a) report that short volume, relative to total trade volume, (short ratio) is 24% for NYSE-listed stocks and 31% for Nasdaq stocks. In a separate study and a reduced time period (February–July, 2005), Diether, Lee, and Werner (2009b) show similar statistics for their NYSE sample and an even higher short ratio for Nasdaq stocks. Edwards and Hanley (2008) document a positive coefficient for a Nasdaq dummy variable when investigating relative short sales around initial public offerings. Alexander and Peterson (2008), while analyzing the impact of Reg SHO on market liquidity, report higher short sales, relative to long sales, for their Nasdaq sample compared to their NYSE sample.

Many short-sale studies either examine NYSE and Nasdaq stocks separately or pool the different listed stocks and acknowledge the need to control for the influence of exchange listing by, for example, adding an indicator variable. Henry and Koski (2008) do not explicitly divide their sample of seasoned equity offerings (SEO) into NYSE and Nasdaq stocks, but control for the influence of exchange listing on SEO discount by inclusion of a dummy variable. Diether et al. (2009a) not only report their empirical results for NYSE and Nasdaq stocks separately, but argue that it is important to consider trading outside the primary-listing market.

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In this study, we match NYSE-listed stocks to Nasdaq-listed stocks based on several factors that influence short selling following the methods in Huang and Stoll (1996), Bessembinder and Kaufman (1997a,b), and Chung, Van Ness, and Van Ness (2001). We calculate the short ratio for each listed stock using executions on all exchanges and using only executions on the primary-listing exchange. When including short-sale and trading activity of all exchanges, we confirm that short selling of Nasdaq stocks is significantly greater than short selling of NYSE stocks, which is consistent with Diether et al. (2009a) and Edwards and Hanley (2008). However, when examining short activity from only the primary exchange, we find that relative short selling is higher on the NYSE than on Nasdaq. This new result indicates that while shorting activity is higher in Nasdaq-listed stocks, more short sales (relative to total trades) are executed on the NYSE.

Prior research documents that short sellers are informed and able to predict negative returns (Aitken et al., 1998; Boehmer, Jones, & Zhang, 2008; Christophe, Ferri, & Angel, 2004; Desai, Ramesh, Thiagarajan, & Balachandran, 2002; Diamond & Verrecchia, 1987; Senchack & Starks, 1993). Diether et al. (2009a) examine the relation between returns and daily shorting activity. They document that short selling relates directly with contemporaneous and past returns, suggesting that short sellers are contrarian traders. While Diether, Lee, and Werner do not directly compare short sellers of NYSE stocks and short sellers of Nasdaq stocks, the magnitude of the coefficients from panel regressions suggests that NYSE short sellers are slightly more contrarian than Nasdaq short sellers.

In pooled tests, we show that both NYSE and Nasdaq short sellers are contrarian in contemporaneous and past returns and are able to predict future negative returns when examining trades on all exchanges. These results are consistent with the idea that short sellers correct short-term overreactions of stock prices and are able to target stocks that become overvalued (Diether et al., 2009a), thus adding to the informational efficiency in prices (Boehmer & Wu, 2008). However, when examining trades on the primary exchange only, the results in this paper document that NYSE short sellers are not significantly contrarian in past returns. After matching NYSE stocks to Nasdaq stocks, we find new evidence that short sellers of Nasdaq stocks are more contrarian in contemporaneous returns than short sellers on NYSE stocks. These results are robust to examining trades on only the primary exchange and trades on all exchanges. Further, when comparing the information contained in NYSE and Nasdaq short selling, we show that short sellers on Nasdaq are better at predicting negative next-day returns than short sellers on the NYSE. Again, this result is consistent in both our primary exchange analysis and our analysis of all exchanges. Our findings that short sellers on Nasdaq are more contrarian and better able to predict negative returns than short sellers on the NYSE is consistent with the findings of Theissen (2000), who documents that prices in auction markets are more efficient than prices in dealer markets. The greater market efficiency on the NYSE makes it more difficult for NYSE short sellers to predict negative returns and allows informed short sellers to target stocks with prices that are out of line with their fundamental values, which occurs more frequently on Nasdaq.

Boehmer et al. (2008) find that larger short sales are more informed than smaller short sales. We compare the frequency of various short-sale sizes in our study of the return predictability of short activity on the NYSE and Nasdaq. We calculate the proportion of volume from the small trade-size category (less than 500 shares) that is made up by small short sales. Similarly, we determine the proportion of medium-sized-trade volume (500 to 5000 shares) and large-sized-trade volume (greater than 5000 shares) that is made up from medium-sized and large-sized short sales, respectively. We find that short volume relative to total trade volume in the small trade-size category is more frequent on the NYSE. Further, large short volume relative to large trade volume is greater on Nasdaq. Our results are robust to short selling on both the primary exchange and all exchanges.

In other tests, we find that the contrarian behavior of Nasdaq short sellers is stronger than NYSE short sellers in each trade-size category. Further, we show that the short ratio on Nasdaq is better at predicting negative returns than the short ratio on the NYSE in each trade-size category. Again, these results are robust to both short selling on primary exchanges and short selling on all exchanges.

Combined, our findings contribute to the literature in three ways. First, while Diether et al. (2009a) show that the level of shorting activity on Nasdaq is greater than the level of shorting activity on the NYSE, we find that the opposite is true when examining trades on the primary exchange. Second, we show that the common positive relation between current short selling and both contemporaneous and past returns is markedly stronger for Nasdaq stocks than for matched NYSE stocks. This result suggests that the Nasdaq short sellers are more contrarian than NYSE short sellers. Third, we find that the return predictability of short sellers is also stronger on Nasdaq than on the NYSE indicating that Nasdaq short sellers are better at predicting negative returns than NYSE short sellers. Both the second and third results are robust when analyzing the primary exchange and all exchanges and different trade-size categories. These new results provide a greater understanding of listing arrangements and informed trading. While Boehmer (2005) finds that informed trading is greater on the NYSE than on Nasdaq and Affleck-Graves et al. (1994) find that asymmetric information is greater on the NYSE, our results indicate that informed short selling is more abundant on Nasdaq.

The rest of the paper follows: Section 2 describes the data and presents the results of our different matching procedures. Section 3.4 reports the results of our empirical analysis. We offer a summary of our findings in Section 4.

2. Data

In our analyses, we use data that is made available by the Securities and Exchange Commission's Regulation SHO and trade transactions from the Trade and Quotes (TAQ) data base. Our initial sample includes all NYSE- and Nasdaq-listed common stocks (CRSP share code 10 or 11) that trade everyday of 2006 and have a price greater than \$5.¹ After these restrictions, there are 1251 NYSE-listed stocks and 1588 Nasdaq-listed stocks. Similar to Diether et al. (2009a), we calculate the short ratio, which is the daily short volume divided by the daily trade volume. Before obtaining our matched samples, we find that the short ratio for Nasdaq-listed stocks is more than 5% greater than the short ratio for NYSE-listed stocks, which is significant at the 1% level (difference = 5.16%, p -value = 0.000).² The result of this simple comparison is similar Diether et al. (2009a). We match stocks from the initial sample based on characteristics in order to isolate the difference between short selling on the NYSE and short selling on Nasdaq.

NYSE-listed stocks and Nasdaq-listed stocks are matched following Huang and Stoll (1996), Bessembinder (1999), Bessembinder and Kaufman (1997a,b), and Chung et al. (2001). The level of short-selling activity in a particular stock is influenced by its size, volatility, and trading activity (Arnold et al., 2005; Boehmer et al., 2008; Diether et al., 2009a). When matching NYSE stocks to Nasdaq stocks, we calculate the following score:

$$\sum_k \left[\frac{Z_k^N - Z_k^D}{\{(Z_k^N + Z_k^D)/2\}} \right]^2 \quad (1)$$

¹ We reproduce most of our results for these excluded stocks. The purpose of eliminating illiquid stocks is because D'Avolio (2002) shows that illiquid stocks suffer from binding short-sale constraints. Consistent with this idea, we find that eliminated stocks report shorting activity for only approximately 50% of the stock-day observations.

² When examining all exchanges for the universe of NYSE-listed stocks, 22.7% of total trade volume is made up from short sales. Similarly, nearly 28% of all trade volume on Nasdaq is made up from short sales. When examining shorting on the primary exchange, nearly 36.7% of all trade volume on the NYSE is made up from short sales while 34.4% of all trade volume on Nasdaq comes from short sales.

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