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Symposium on market microstructure: Focus on Nasdaq

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Abstract

This special issue of the *Journal of Financial Economics* includes six articles that analyze the market microstructure of Nasdaq in various ways. The question of the costs of trading on Nasdaq has become contentious in both the academic and legal/regulatory arenas since the Christie and Schultz (1994) article first noted that many actively traded Nasdaq stocks were almost never quoted on odd eighths. The articles in this symposium bring new and interesting insights to this debate.

Keywords: Market microstructure; NYSE; Nasdaq; Bid–ask spreads

JEL classification: G14; G20; D23

1. Introduction

The goal of this brief overview is to help readers view the articles in this symposium as an important part of a rapidly expanding literature that has deepened our understanding of the workings of Nasdaq and other securities markets. The references at the end of this article include all of the articles in this symposium, along with other related articles, some of which appear in earlier issues of the *Journal of Financial Economics*. The articles in this symposium also list related articles among their references.

I have benefited from comments from Michael Barclay, William Christie, Roger Huang, Eugene Kandel, Allan Kleidon, David Porter, and Hans Stoll, but I am responsible for any remaining errors. Financial support from the Bradley Policy Research Center at the Simon School, University of Rochester is gratefully acknowledged.

2. Comparison of trading costs on Nasdaq and the NYSE

Bessembinder (1997) analyzes a size-matched sample of 300 Nasdaq and 300 New York Stock Exchange (NYSE) stocks from April through December 1994 using data from the Trade and Quote database from the NYSE. Controlling for factors that should affect market-making costs, he finds that price-rounding practices (which Christie and Schultz call avoidance of odd eighths) are associated with higher trade execution costs on Nasdaq, but not on the NYSE. Bessembinder's evidence confirms and extends results from Huang and Stoll's (1996) comprehensive study of Nasdaq and NYSE execution costs, although his conclusion concerning the relation between rounding practices and execution costs differs from those of Huang and Stoll.

Barclay (1997) analyzes 472 stocks that moved from Nasdaq to either the NYSE or Amex between 1983 and 1992. He finds that when Nasdaq market makers avoid odd-eighth quotes, bid–ask spreads drop substantially after moving to the NYSE or Amex. The drop is smaller for Nasdaq stocks that were quoted in odd eighths frequently before switching exchanges. Barclay's evidence complements the evidence in Christie and Huang (1994) that quoted and effective spreads drop when stocks switch from Nasdaq to the NYSE or Amex.

Demsetz (1997) points out an important difference between the auction market of the NYSE, where limit orders are included with the specialist's quotes to determine the best available bid and ask quotes, and the Nasdaq dealer market, where limit orders are handled separately by each dealer and are not generally part of the market quotations seen by other dealers. To the extent that the limit orders of investors represent disparate beliefs about the value of the security, the inside spread (highest bid and lowest ask) can be below the cost of market making. On the other hand, in a dealer system like Nasdaq, posted quotations must reflect the willingness of dealers to buy or sell at posted quotations, so they must cover the cost of market making.

Interestingly, new SEC rules that expose limit orders on the Nasdaq system as part of the best quotes were implemented on 20 January, 1997. The National Association of Securities Dealers (NASD) has published preliminary analysis of trading in the affected stocks on the World Wide Web (http://www.nasd.com), and the results are consistent with Demsetz' analysis. Quoted spreads have fallen by about 33% and effective spreads have fallen by about 24% for the stocks for which investor limit orders are included as part of the inside quotes. Since there were several other rule changes at the same time intended to promote competition on Nasdaq, it would be premature to conclude that Nasdaq spreads that include limit orders are less than the costs of market making, but it seems clear that including limit orders in the quoted spreads has lowered transactions costs for investors trading in these Nasdaq stocks.

3. Models of the Nasdaq dealer market

Kandel and Marx (1997) use a model of Bertrand competition to show that quotations in a dealer market such as Nasdaq can support an equilibrium in which the bid–ask spread equals the marginal cost of handling trades plus two 'ticks' (the minimum allowable price increment). They argue that stocks trading above \$10 per share, which have a minimum tick size of one-eighth or \$0.125 on Nasdaq will have significantly higher average quoted spreads than stocks trading below \$10, which have a minimum tick size of one-sixteenth or \$0.0625, all else equal. They provide evidence to confirm this prediction. Finally, they argue that the odd-eighth avoidance found by Christie and Schultz could be a profitable coordination mechanism used by market makers to increase spreads, even if overt collusion is not involved.

Godek (1996) and Dutta and Madhavan (1997) argue that 'preferencing' or internalization of order flow, which directs orders received by a particular retail broker to a particular market maker to be executed at best the prevailing quotes on Nasdaq, rather than sending the orders to the market maker who is posting the best bid or ask quote, reduces the incentive of all market makers to improve market quotations. They argue that this contractual arrangement or vertical integration is an important reason that Nasdaq quotations seem high in comparison with the centralized auction market of the NYSE. Chordia and Subrahmanyam (1995) also study the relation between tick size, spread size, and preferencing.

4. Other aspects of Nasdaq markets

Harris and Schultz (1997) analyze the effects of the February 1994 changes in Nasdaq's Small Order Execution System (SOES). SOES trades execute automatically through computer networks at the best posted bid and ask quotes. These trades are the only trades on Nasdaq that must be executed at quoted prices. Otherwise, dealers are free to trade at prices that differ from their posted quotes based on telephone negotiations, which is why average effective spreads are usually less than quoted spreads. Beginning in February 1994, the maximum SOES order size was reduced from 1000 shares to 500 shares. Harris and Schultz find that the proportion of volume from SOES trades fell by more than 50% after January 1994, but average quoted and effective spreads were unaffected. Also, the number of market makers quoting stocks was unchanged. They infer that the costs to market makers from having to deal with informed SOES traders fell as a result of this rule change, but there was no response to these lower costs in terms of lower quoted spreads.

LaPlante and Muscarella (1997) compare the price impacts of block trades (10,000 shares or more) on Nasdaq versus the NYSE during 1990. Some have argued that dealer markets, such as Nasdaq, are well suited to providing greater

depth for institutional traders. From this perspective, the higher quoted spreads on Nasdaq might affect small traders (since quotes are binding for trades up to 1000 shares), but not large traders who can negotiate with dealers to realize lower transactions costs. LaPlante and Muscarella study the ten largest Nasdaq stocks based on 1990 equity capitalization and compare several measures of the price impact of block trading with several matched samples of NYSE-listed stocks. Across all these comparisons the evidence shows that price impacts of block trades are higher on Nasdaq than on the NYSE. This is consistent with the evidence of Keim and Madhavan (1995) who use proprietary trading data for 21 institutional investors and find that transactions costs of block trades are larger on Nasdaq for all but the largest category of stocks. Thus, the evidence is inconsistent with the argument that the Nasdaq system provides greater depth for institutional traders.

Finally, Porter and Weaver (1996) show that during 1990 Nasdaq dealers reported trades that were out of sequence (more than 90 seconds after the trade occurred) at a much higher rate than for exchange-listed stocks. This problem was particularly acute at the end of the trading day, from 4:00 to 4:30 P.M. They raise questions about whether late trade reporting is used by dealers to manage the flow of information to the market (which would violate Securities and Exchange Commission rules).

5. Conclusions

The articles in this special issue of the Journal of Financial Economics add both theory and evidence to the ongoing debate about the costs of trading on Nasdaq. For example, Bessembinder (1997), Barclay (1997), and Kandel and Marx (1997) all find that stocks that are only rarely quoted using odd eighths have average inside bid–ask spreads that are between \$0.18 and \$0.21 larger than stocks for which odd-eighths quotes are used frequently, holding other factors that affect spreads constant. In addition to the concerns about potential lack of competition among Nasdaq market makers, questions are raised about several issues:

(1) Should the minimum tick size (price increment) be reduced to encourage more competition?
(2) Should customer limit orders be allowed to compete with dealer quotes in the Nasdaq system (perhaps with the initiation of some type of order-handling fee)?
(3) Should preferencing or vertical integration arrangements be discouraged so that market makers who compete on price by offering better quotes receive more order flow?
(4) How should the SOES evolve and what effect has it had on the other parts of the market for Nasdaq stocks?

I suspect that academic and public policy debate on these and other related questions will continue for many years. The evidence in articles such as those contained in this special issue should provide important information for this debate.

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