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# Order handling rules, tick size, and the intraday pattern of bid–ask spreads for Nasdaq stocks<sup>☆</sup>

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## Abstract

In this study we perform a before-and-after analysis of intraday variation in bid–ask spreads surrounding two recent Nasdaq market reforms. We find that spreads declined significantly after the order handling rule changes and the magnitude of the decline is largest during midday. The results are consistent with our conjecture that, like on the NYSE, limit-order traders on Nasdaq play a significant role in the quote-setting process. Our empirical results also show that the magnitude of the spread reduction associated with the tick-size change is largest (smallest) during the last (first) hour of trading. We interpret these results using inventory and information models of the spread. © 2001 Elsevier Science B.V. All rights reserved.

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## 1. Introduction

Numerous studies examine intraday variation in the bid–ask spread of NYSE-listed stocks. McInish and Wood (1992), Brock and Kleidon (1992), Lee et al. (1993), and Chan, et al. (1995b) find that the spread is widest at the beginning of the trading day, narrows during the day, and then widens near the close. These studies attribute the observed U-shaped intraday pattern of spreads to specialists' attempt to exploit their market power and/or to deal with the inventory and information asymmetry problems.<sup>1</sup> Chan et al. (1995a) examine the intraday pattern of spreads for Nasdaq-traded stocks. They show that Nasdaq spreads decline throughout the day and the magnitude of the decline is largest during the last 30-minutes. They attribute the difference in intraday spreads between NYSE and Nasdaq stocks to structural differences between specialist and dealer markets.

The Securities and Exchange Commission (SEC) enacted major changes in the order handling rules (OHR) on Nasdaq in 1997. The Limit Order Display Rule was phased-in for all Nasdaq National Market System (NMS) issues from January 20, 1997 to October 13, 1997. The rule requires that limit orders be displayed in the Nasdaq BBO (i.e., best bid and offer) when they are better than quotes posted by market makers. The new rule allows the general public to compete directly with Nasdaq market makers in the quote-setting process. The second SEC rule, known as the “Quote Rule,” requires market makers to publicly display their most competitive quotes. This rule gives the public access to quotes posted by market makers in Electronic Communication Networks (ECN). Under the new rule, if a dealer places a limit order into Instinet or another ECN, the price and quantity are incorporated in the ECN quote displayed on Nasdaq if it represents the best bid or offer in ECN.

The “Actual Size Rule,” reduces the minimum quote size (depth) of market makers from 1000 shares to 100 shares and thereby allows greater flexibility in their quote decisions. This rule was enacted in the belief that the smaller minimum depth requirement reduces the risks that Nasdaq dealers must take and thereby encourages market makers to maintain competitive quotes. The final feature of the OHR changes involves an amendment in the “Excess Spread

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<sup>1</sup> Microstructure models that deal with order arrival and quote revision fall into the three general categories: inventory, market power, and asymmetric information models. In the inventory models (see Stoll, 1978; Amihud and Mendelson, 1980, 1982; Ho and Stoll, 1981), the spread compensates market makers for bearing the risk of holding undesired inventory. Market-power models link intraday variations in spreads to the monopoly power of specialists. Stoll and Whaley (1990) suggest that the specialist's ability to profit from privileged knowledge of order imbalances implies wide spreads at the open and close. Information models (see, e.g., Copeland and Galai, 1983; Glosten and Milgrom, 1985; Easley and O'Hara, 1987; Madhavan, 1992; Foster and Viswanathan, 1994) focus on the adverse selection problem faced by market makers.

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