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Transparency and market quality: Evidence from SuperMontage

Kee H. Chung [a,*], Chairat Chuwonganant [b]

[a] State University of New York (SUNY) at Buffalo, Buffalo, NY 14260, USA
[b] Kansas State University, Manhattan, KS 66506-0503, USA

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ABSTRACT

In this study, we examine the effect of pre-trade transparency on market quality using data before and after the introduction of SuperMontage. Our results show that both bid–ask spreads and return volatility declined significantly after the implementation of SuperMontage. In addition, SuperMontage led to significant improvements in the SEC Rule 605 execution quality measures (e.g., faster executions and higher fill rates). Overall, our results indicate that SuperMontage improved market and execution quality on NASDAQ through greater pre-trade transparency and the integrated, more efficient quotation and trading system.

1. Introduction

In this study we examine the effect of pre-trade transparency on liquidity and execution quality using data before and after the introduction of SuperMontage. NASDAQ launched SuperMontage on October 14, 2002 and completed its implementation on December 2, 2002. SuperMontage is a fully integrated order display and execution system for NASDAQ-listed securities. The launch of SuperMontage is a significant development in the evolution of trading NASDAQ securities. Prior to SuperMontage, NASDAQ collected and displayed the single best bid and offer (BBO) from each market participant.[1] Traders did not have an access to untapped pools of liquidity below this Top-of-File Pric-

* Corresponding author.
E-mail address: keechung@buffalo.edu (K.H. Chung).

[1] Market participants include market maker, electronic communications network (ECN), and Unlisted Trading Privileges (UTP) Exchange.

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ing. The inability to observe market participants' trading interests below a single price level deprived investors/traders of valuable information about market participants' collective willingness to trade.

After the introduction of SuperMontage, market participants can continue to send NASDAQ only their best bid and best offer prices. Alternatively, they can enter multiple orders and quotes at different price levels. SuperMontage then displays the aggregate trading interest of all market participants at five price levels on a dynamic (real time) basis and additional price levels on a non-dynamic basis. The increased pre-trade transparency helps investors and market participants make better-informed trading decisions. We examine how the increased transparency associated with SuperMontage has affected the bid–ask spread, return volatility, quote aggressiveness, and measures of execution quality. Although the initial conception of SuperMontage was largely motivated by NASDAQ's desire to increase its market share through greater transparency and access to liquidity below the best price level, we conjecture that the new order display system and trading platform exert a significant impact on liquidity and execution quality. To the best of our knowledge, our study is the first comprehensive academic study of the effect of SuperMontage on market quality.

We first examine differences in spreads between the pre- and post-SuperMontage periods using a large sample of NASDAQ-listed securities. Our results indicate that quoted and effective spreads declined significantly after the launch of SuperMontage. We perform a robustness test using a control sample of NYSE stocks to examine whether our results are driven by market-wide changes in spreads over time. We also check whether our results could be explained by changes in stock attributes between the pre- and post-SuperMontage periods. The results show that the reduction in quoted and effective spreads remains significant after controlling for secular trends in spreads or concurrent changes in stock attributes. Based on these results, we conclude that the reduction in spreads could largely be attributed to the effect of SuperMontage.

Because SuperMontage allows market participants to submit multiple orders and quotes, the aggregate depth at each price level is likely to be greater under SuperMontage than under its predecessor SuperSOES.[2] With the greater liquidity available at each price level, including that at the inside market,[3] it would take more volume to move the price. These considerations suggest that return volatility is likely to decrease after the introduction of SuperMontage. However, we note that SuperMontage allows multiple orders to move through different price levels quickly in a single transaction. This feature may actually increase return volatility. Prior theoretical literature (detailed in the next section) also offers conflicting predictions as to the effect of pre-trade transparency on return volatility. Therefore, whether SuperMontage increases or decreases return volatility is an empirical question. We compare the return volatility of NASDAQ stocks before and after the implementation of SuperMontage and find that return volatility is significantly lower during the post-SuperMontage period.

We examine whether the probability that market participants' quotes are at the inside market is higher when they are allowed to submit multiple quotes than when they are allowed to submit a single quote. Market participants may have a greater incentive to quote aggressively and thus be at the inside market more often (i.e., be more competitive) when they are able to see the liquidity available at multiple prices than when they see the liquidity available only at a single price. We acknowledge that the inside spread of a given stock under SuperMontage is likely to be different from its inside spread under SuperSOES. Our conjecture is that more market participants would be at the inside market in a more transparent market, irrespective of the size of the inside spread. To test this conjecture, we compare price and size aggressiveness between the pre- and post-SuperMontage periods. For each stock, we measure a market participant's price aggressiveness by the proportion of time at the inside market using the NASDAQ Trade and Quote (NASTRAQ) data. We measure a market participant's size aggressiveness by the ratio of the market participant's quoted depth to the average quoted depth of all market participants at the inside. Consistent with our conjecture, we find

[2] Before the introduction of SuperMonatge, NASDAQ's quotation management system only accepted and displayed a single quote from each participant. With SuperMontage, a participant can supplement its quote with as many customer limit orders as it wants. In fact, a participant can submit its entire limit order book to the system. Hence, the available depth at each price level is likely to be greater under SuperMontage.

[3] The inside market consists of the highest bid and lowest ask prices among all available dealer quotes and outstanding limit order prices.