



The impact of transparency on market quality for the Taiwan Stock Exchange

Mei-Chu Ke ^{a,*}, Yen-Sheng Huang ^b, Tung Liang Liao ^c, Ming-Hui Wang ^a

^a Department of Industrial Engineering and Management, National Chin-Yi University of Technology, Taiwan

^b Department of Business and Management, Ming Chi University of Technology, Taiwan

^c Department of Finance, Feng Chia University, Taiwan

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ABSTRACT

This paper examines the impact of increased transparency on market quality for stocks listed on the Taiwan Stock Exchange in the pre- and post-period of enhanced transparency starting from January 1, 2003. The Taiwan Stock Exchange discloses unexecuted orders of the five best bid and ask prices following the increased transparency. The empirical results indicate a significant improvement in market quality following the enhanced transparency. Both the bid–ask spreads and the standard deviation of returns decrease significantly in the post-period. Moreover, market depth increases significantly in the post-period. Finally, the results are robust when the market quality of different trading-volume groups is examined.

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1. Introduction

The issue of how transparency affects market quality is important in the design of financial exchanges. The ability of traders to observe information in the trading process will affect their supply of and demand for liquidity. Although transparency may potentially contribute to the improvement of market quality, both theoretical analysis and empirical results on the impact of transparency are mixed. Proponents suggest that increased transparency improves market quality because investors' risk of trading with informed traders would become lower. However, enhanced transparency may discourage informed traders from supplying liquidity because they would be forced to disclose their private information when their submitted orders are revealed to other market participants.

Previous empirical results on the impact of transparency on market quality are mixed. Using data from the OpenBook of the New York Stock Exchange (NYSE), [Boehmer, Saar, and Yu \(2005\)](#) report improved market quality under enhanced transparency. However, [Madhavan, Porter, and Weaver \(2005\)](#) find that increased transparency is associated with reduced liquidity. They report larger effective bid–ask spreads and percentage spreads following increased transparency in the Toronto stock market. Thus, further empirical research is needed to enhance our understanding of how transparency affects market quality.

* Corresponding author at: Department of Industrial Engineering and Management, National Chin-Yi University of Technology, No.57, Sec. 2, Zhongshan Rd., Taiping Dist., Taichung 41170, Taiwan. Tel.: +886 423924505x7654; fax: +886 423934620.

E-mail address: kemc@chinyi.ncut.edu.tw (M.-C. Ke).

Starting from January 1, 2003, the Taiwan Stock Exchange decided to enhance transparency by disclosing unexecuted orders of the five best bid and ask prices to investors. This change in the disclosure rule is a natural experiment on the effect of transparency on market quality. As such, this paper attempts to examine the impact of enhanced transparency on market quality by comparing stock price behavior during the period before and after the enhanced transparency starting on January 1, 2003.

The main features of the Taiwan Stock Exchange involve the use of a call auction method to match orders via an electronic system in the daily trading time from 9:00 a.m. until 1:30 p.m. For the opening, submitted buy and sell orders are aggregated over the pre-trading time from 8:30 to 9:00 a.m. and then matched to determine the opening price. Following the opening, buy and sell orders are aggregated over a time interval of approximately 30 to 45 s and then matched in the daily trading session from 9:00 a.m. to 1:25 p.m. For the closing, the orders are aggregated over the last five minutes of daily trading time from 1:25 p.m. to 1:30 p.m. and then matched to determine the closing price.

Retail investors play an important role in the trading volume of the Taiwan Stock Exchange in the sample period of 2002–2003. Security transactions of domestic individuals accounted for 82.3% and 77.8% of transactions in 2002 and 2003, respectively, and the remaining transactions were by institutional investors. In general, retail investors have less access to private information. Thus, they are in a disadvantaged position when trading with informed traders such as institutional investors. With the disclosure of submitted orders at the five best bid and five best ask prices starting on January 1, 2003, retail investors' risk of trading with informed investors would become lower. Thus, it is expected that the increased transparency would benefit retail investors and improve market quality.

We examine market quality by comparing stock price behavior in the pre- and post-period surrounding the enhanced transparency starting on January 1, 2003. The empirical results indicate that market quality improves significantly following increased transparency. Both the bid–ask spreads and the standard deviation of returns decrease significantly under the increased transparency. Moreover, market depth improves significantly in the post-period. Finally, the results are robust when market quality is examined over different trading-volume groups.

This paper is organized as follows. The next section provides a brief review of previous literature. The third section presents the institutional background of the Taiwan Stock Exchange. The fourth section describes the data and methodology used in this research. The fifth section reports the empirical results. The final section presents the conclusion.

2. Literature review

Market transparency provides traders with the opportunity to observe information in the trading process, including trading prices, bid–ask quotes, order flows, trading volumes, and the identities of market participants, among others (see, for example, O'Hara, 1995; Madhavan, 2000; Comerton-Forde & Rydge, 2006 for a detailed literature review). Proponents suggest that increased transparency is associated with improved liquidity. Pagano and Roell (1996) conducted a theoretic analysis of the impact of transparency on liquidity and conclude that greater transparency generates lower trading costs on average for uninformed traders. Similarly, Baruch's (2005) analysis suggests that traders who demand liquidity are better off when the limit-order book is open while liquidity suppliers are better off when the limit-order book is closed.

However, transparency raises the concern of the free option problem as pointed out in Copeland and Galai (1983), Easley and O'Hara (1991), Seppi (1997) and Foucault (1999), among others. These models suggest that when limit-order traders submit orders at a specified limit price, they are essentially writing free put options to market-order traders. Thus, these limit-order traders face the risk of being picked off by other informed traders when information on the limit-order book is made transparent to the public. Thus, limit-order traders may be less willing to provide liquidity under a transparent environment. Similarly, O'Hara (2001) suggests that excessive transparency can encourage free-riding or price manipulation. She argues that allowing traders to hide certain features of their orders may encourage participation and improve market liquidity.

Bloomfield and O'Hara (1999) conducted laboratory experiments to examine the effects of trade and quote disclosure on market efficiency. They show that trade disclosure increases the informational efficiency of transaction prices, but also increases opening bid–ask spreads due to the reduced incentives of market makers to compete for order flow. Thus, their experiments indicate that trade disclosure benefits market makers at the expense of liquidity traders and information traders.

Boehmer et al. (2005) examine the impact of increased pre-trade transparency by the NYSE's introduction of OpenBook on January 24, 2002. The empirical results indicate that market liquidity increases in that the price impact of orders declines and that the informational efficiency of prices improves. The empirical evidence of a decline in effective spreads suggests that the trading costs incurred by liquidity demanders decrease with the introduction of the OpenBook.

However, the empirical evidence in Madhavan et al. (2005) indicates that, based on data from the Toronto Stock Exchange, increased pre-trade transparency reduces liquidity. In particular, return volatility and execution costs increase after the limit-order book is publicly displayed. Moreover, the reduction in liquidity is associated with significant declines in stock prices.

Eom, Ok, and Park (2007) examine the effect of transparency changes on the Korea Exchange in 2000 and 2002. The Korea Exchange increases the number of publicly disclosed quotes from three to five quotes on March 6, 2000 and from five to ten quotes on January 2, 2002. They find that the 2000 event improves market quality. In comparison, the 2002 event improves market quality much

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