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Limit order book transparency and order aggressiveness at the closing call: Lessons from the TWSE 2012 new information disclosure mechanism



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ABSTRACT

Based on the recent TWSE limit order book (LOB) information disclosure mechanism, this paper contributes to the studies on the determinants of order aggressiveness in the closing call. First, on the less well-studied effect of market transparency, we find that, in entering new orders, both individual and institutional investors become more aggressive after the market becomes partially transparent. Second, even though order book information is not available during the opaque period, the effect of the spread on order aggressiveness is still significant, which is evidence of the existence of the expectation effect. Third, the launch of the new mechanism has further reinforced the effect of the spread for individual investors; it, therefore, may answer to the need of individual investors more than it may do for institutional investors.

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1. Introduction

There has been a proliferation of research concerning the microstructure of financial markets in recent years. Various aspects concerning the behavior of different players in the stock market have received quite a lot of attention and the plausible determinants of their behavior have been scrutinized.

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Consider the case of an order driven market, where the order placement activities, frequently characterized by *order aggressiveness*, play a crucial role. Studies indicate that knowledge regarding the order aggressiveness of informed and uninformed traders is vital to understanding how new information is incorporated into prices (Harris, 1998; Anand et al., 2005; Bloomfield et al., 2005).¹ Both the theoretical and empirical literature often suggest that order aggressiveness is influenced by factors such as the bid–ask spread (Handa and Schwartz, 1996; Ahn et al., 2001; Lo and Sapp, 2010), volatility (Foucault, 1999; Ranaldo, 2004; Goettler et al., 2005; Aitken et al., 2007), order size (Duong et al., 2009; Moshirian et al., 2012), submission time (Harris, 1998; Anand et al., 2005; Bloomfield et al., 2005; Ellul et al., 2007; Ma et al., 2008; Duong et al., 2009), market depth (Parlour, 1998; Griffiths et al., 2000; Ranaldo, 2004; Pascual and Veredas, 2009; Valenzuela and Zer, 2013), the long-memory property of order aggressiveness (Biais et al., 1995; Griffiths et al., 2000; Ellul et al., 2007; Pascual and Veredas, 2009; Yamamoto, 2011), and the transparency of the Limit Order Book (hereafter, LOB) (Flood et al., 1999; Bortoli et al., 2006; De Winnie and Dhondt, 2007; Ma et al., 2008). However, most of these studies focus on the regular continuous-auction period. Studies concerning the forces influencing order aggressiveness outside the regular trading period, such as the pre-opening or closing periods, are rare. To what extent the results of these studies can be extended to the beginning and ending sessions remains to be addressed.

One purpose of this paper is to extend the study of order aggressiveness to the closing period, which in turn is motivated by a new information disclosure mechanism carried out by the Taiwan Stock Exchange (TWSE) on its closing call auction. The *closing call auction* is a mechanism designed to determine the *closing price* for each trading day.² It has been widely used to determine the closing prices in major stock exchanges since the late 1990s, and partially because it can help improve the market performance indicators (Pagano and Schwartz, 2003) and reduce the degree of market manipulation (Comerton-Forde et al., 2007).³ Following this trend, since July 2002 the TWSE has instituted a closing call auction for the last 5 min of the market, i.e., from 13:25 to 13:30. Initially, no real-time LOB information was provided during this closing call period. Investors, therefore, were not insulated from the fear of being the victims of information asymmetry due to these so-called “black-box” transactions. In response, the TWSE introduced a new disclosure mechanism for the closing call on February 20, 2012. Under this new mechanism, the best simulated quotes, namely, both the best bid and ask of the closing call session are required to be disclosed every 20 s.⁴ This marked the end of a long-lasting era of the “black-box” transactions during the last 5 min of a trading day on the TWSE.⁵

The TWSE “experiment” provides a *unique* opportunity to examine the effect of information disclosure on investors’ order aggressiveness during the closing call auction. The uniqueness lies in the nature of the changes concerning the transparency levels of the LOB information. Prior to this new mechanism, the transactions were completely opaque, and termed as “black-box” transactions. Some degree of transparency has ensued because of the new mechanism. This unique switch from the completely opaque period to a partially

¹ Additionally, in a continuous auction, order aggressiveness even determines the incoming trader’s expected time-to-execution (Harris and Hasbrouck, 1996; Lo et al., 2002).

² Compared to the intraday prices, the closing price plays a unique information role for investors. For example, it is pertinent for mutual fund performance (Hillion and Suominen, 2004), the final settlement price of composite futures (Huang and Chan, 2010), arbitrage strategies of futures, technical analysis (Ko et al., 2014), candlestick charting (Lu, 2014) and the value of security collateral assessed by the financial sector. In addition, it may also affect the opening price and limit-up, limit-down prices of the next trading day, especially in many Asia-Pacific stock exchanges, which set daily price limits.

³ Most major stock exchanges have both opening call and closing call auctions. The Hong Kong Stock Exchange (HKSE) and SHSE are among the few exceptions that have only opening call auctions. For the stock exchanges with closing call auctions, daily closing prices will be usually based on the closing auction price (Kandel et al., 2012). Nasdaq and the Tel Aviv Stock Exchange (TASE) are the only exceptions to this. The former employs the closing cross price, introduced in April 2004, and the latter takes a weighted average of the transaction prices.

⁴ More precisely, it is the best simulated *unexecuted* quotes. In this paper, both the simulated best quotes released by the TWSE in a 20-second increment and our simulated best quotes using the reconstructed real-time order book all refer to the best simulated *unexecuted* quotes. With this understanding, from now on, we shall simply use “best simulated quotes” or “best simulated bid and ask” by making “unexecuted” implicit.

⁵ In spite of this the extent of the LOB information disclosure in Taiwan has remained considerably insufficient compared to international standards. For example, the Singapore Exchange (SGX), London Stock Exchange (LSE), and Australian Securities Exchange (ASX) all disclose the entire quotes and volume information of the LOB. The Korea Exchange (KRX) and Tokyo Stock Exchange (TSE) disclose the top three and four quotes of the LOB. The Shanghai Stock Exchange (SHSE) and Shenzhen Stock Exchange (SZSE), based on the simulated matching of the LOB, disclose what is known as the indicative auction price, indicative equilibrium volume, and expected unexecuted volume.

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