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Opening and closing price efficiency: Do financial markets need the call auction?

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ABSTRACT

We model 73.62 million London Stock Exchange (LSE) trades and show that the LSE's high rate of failure to open at the opening auction only relates to low volume stocks. Low volume stock traders avoid trading until the open; this seems connected to their evading the informed trading-dominated opening auction. For the largest volume stocks, the opening auction provides highly efficient opening prices, while the lower volume stocks attain similar levels of price efficiency only after the start of normal trading hours (NTH). At the close however, all stocks only lose small fractions of informational efficiency achieved during the NTH.

1. Introduction

The question of how financial instruments' prices develop on financial platforms has fascinated both academic researchers and practitioners for decades. The introduction of computer-aided trading, and relatively more recently, algorithmic trading, has only increased this interest. The process of generating a fair price for an instrument can be quite complicated given possible information asymmetry. However, decades of relentless technological advancement has led to the development of ultra-quick information dissemination processes, which now feed directly into platform trades. The proliferation of information dissemination structures, such as bespoke real-time trading information providers and 24-h financial markets news channels such as CNBC and Bloomberg, has now led to an unprecedented timely release of information to the market place. These streams of data feed directly into algorithmic trading strategies, which have been shown to improve trading quality by narrowing spreads, reducing adverse selection and enhancing the informativeness of quotes (see Hendershott et al., 2011). Even with these advancements, establishing an opening reference price after a market closure can still be a challenging process. Market closure may be due to the close of regular trading, trading suspensions or temporary halts. For traders, establishing a fair price after such closures is critical to trading strategy. The importance of the pre-open to price discovery is demonstrated by Biais et al. (1999) and Cao et al. (2000) who show evidence of 'learning' through the posting of non-binding

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quotes on the Paris Bourse and NASDAQ respectively. It is also important to note that opening prices may influence trader disposition throughout the trading day, and closing prices may be the basis for settling derivative contracts.

Given the significance of the opening and closing prices to trading, we investigate whether the call auction, one of the most popular opening mechanisms in major markets, yields efficient opening prices. We employ data from the world's oldest and fourth largest exchange by trading volume, the London Stock Exchange (LSE). The LSE is an interesting market to study because it is a hybrid trading platform. On the platform there is direct competition for order flow between participants (mainly institutional investors) in the broker–dealer market and others who directly submit orders to the limit order book. This is an interesting mix that naturally should enhance market quality. However, results obtained suggest that the opening call auction is only informative for the highest volume stocks, while for the low volume stocks, price discovery only really starts after the market opens as there is a high rate of failure to open at the call for small volume stocks. Furthermore, the dealer–broker trades entered during the pre-open, prior to the call auction, reveal very little information. The price discovery during this period is not significantly different from zero. Given the noise levels in the dealer–broker trades, only the highest volume stocks that succeed at the call are able to post significantly high levels of informational price efficiency during the LSE pre-open. For all stocks however, there is a high level of price efficiency during the normal trading hours (NTH), which only declines slightly after the NTH. We also find that small volume stock traders are likely to avoid trading during the opening call auction, due to the high level of information asymmetry/informed trading occurring during this period. Thus, the decision to avoid the opening call may be due to the need to avoid trading in an environment dominated by informed traders.

One may argue that the significance of the opening price has been reduced by the rise of Electronic Communication Networks (ECNs) and Broker Crossing Networks (BCNs), which make after hours trading possible, albeit with higher levels of informed trading and lower trading volumes (see for example Barclay and Hendershott, 2003). The price discovery process during the after hours trading period is also fraught with inefficiencies relative to the normal trading hours (NTH) session. The prices are more volatile, the adverse selection costs are higher, and thus spreads are generally wider. Barclay and Hendershott (2003) therefore find that price efficiency after hours is less than during the NTH because very little new information is released while trading is also thin. This means that even if post-NTH trading does provide some foundation for opening prices, most market participants are unlikely to trade on that basis because of the noise levels during the price discovery process once the market has officially closed. This underscores the significance of the opening price and the process that generates it. Thus markets around the world have evolved their opening practices in order to facilitate the efficiency of the price discovery process. The most widely adopted pre-open mechanism by platforms is the one we study in this paper – the call auction.

A stream of literature has examined the impact of the introduction of opening and closing call auctions on market quality. However, to our knowledge there is no linkage between informational efficiency and other market quality characteristics evolving in the opening auction, to the NTH market efficiency within an intraday modelling framework. The general approach has been to test whether the introduction or evolution of a trading system/mechanism positively or negatively influences market characteristics. A number of these studies mainly adopt an event study framework employing daily data (opening and closing prices). Thus none of the contributions have actually examined these issues on an intraday basis using high frequency trading data. Further, most of the focus has been on the introduction of closing auctions rather than opening auctions. For example, Chelley-Steeley (2008, 2009) investigate the market quality impact of the introduction of the closing auction on the LSE. Both studies document market quality improvements based on daily level data. The studies, however, do not isolate the direct market quality impacts of auction trades during the opening or closing call auction periods on continuous trading during the NTH. Pagano and Schwartz (2003) and Comerton-Forde et al. (2007) examine the introduction of the closing auction on the Paris Bourse and the Singapore Stock Exchange respectively; both papers suggest that the introduction of the call closing auction improves market quality. Comerton-Forde et al. (2007) also consider the impact of the closing auction in tandem with the opening auction without decomposing the impacts since both were introduced during the same month, and their study also employs daily data in an event study context. Another study, which focuses on the Singapore Stock Exchange, by Chang et al. (2008) confirms the "*spillover* effect", which was first documented by Pagano and Schwartz (2003) based on their analysis of trading on the Paris Bourse.

Since previous literature streams support the notion that the introduction of call auction enhances market quality, the past decade has seen the introduction of call auctions for closing and, in many cases, also the opening of trading venues across the world. There is a strong theoretical argument for congregating all available market liquidity at a single point in order to determine the fair price of an instrument. Schwartz (2001) asserts that this enhances the accuracy of the price discovery process. The view that the efficiency of the price discovery process is inextricably linked with liquidity is widely supported in the literature and has been further established by Chordia et al. (2008), amongst others. According to Madhavan (1992), since all traders are given access to the same prices at the same time, call auctions reduce information asymmetry. However, this comes at the price of higher information (and thus transaction) costs over time, as auctions can only be periodic at best. Barclay et al. (2008) also show that the consolidation of orders, which occurs during a call auction, rather than the nearness of traders or the involvement of market makers, is the vital factor for price efficiency in a market opening. Furthermore, their results imply that call auctions are more likely to absorb extreme liquidity shock without yielding inefficient prices and volatility. Amihud et al. (1990) find on the Milan Stock Exchange that when a continuous trading period is preceded by a call auction, volatility associated with that continuous trading session is lower than if it had not been preceded by a call auction. The improvement in market quality, usually associated with reduced volatility, perhaps explains why Schnitzlein's (1996) experimental study finds that under a call auction, despite no significant reduction in average price efficiency, there is a reduction in adverse selection costs incurred by uninformed traders. Interestingly, however, empirical evidence presented