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Market quality changes in the London Stock Market

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Abstract

This paper examines the impact that the introduction of a closing call auction had on market quality at the London Stock Exchange. Using estimates from the partial adjustment with noise model of Amihud and Mendelson [Amihud, Y., Mendelson, H., 1987. Trading mechanisms and stock returns: An empirical investigation. Journal of Finance 42, 533–553] we show that opening and closing market quality improved for participating stocks. When we stratify our sample securities into five groups based on trading activity we find that the least active securities experience the greatest improvements to market quality. A control sample of stocks are not characterized by discernable changes to market quality.

JEL classification: G15

Keywords: Microstructure; Pricing efficiency; Market quality

1. Introduction

At the London Stock Exchange, the search for an optimal market structure has encouraged some substantial changes to its trading system in recent years. Most notably, the introduction of SETS (Stock Exchange Electronic Trading System) brought an opening call auction and intraday continuous auction trading to London in 1997. This auction system evolved in 2000 to include a closing call auction.

Changes to the trading system are important because market architecture has been shown to exert a strong influence on market quality. Huang and Stoll (1996), in their cross market analysis of liquidity, showed that bid-ask spreads for matched stocks were higher on the NASDAQ dealer market than on the NYSE auction market. Madhavan (1992) demonstrated that volatility is lower and pricing efficiency higher in an auction market. While, Amihud et al. (1997), Muscarella and Piwowar (2001) and Chelley-Steeley (2006) highlighted that changes to the trading system can influence firm value.

An advantage of call markets noted by Madhavan (1992) is that they provide lower volatility and higher pricing efficiency than other forms of market structure. This was supported by Amihud and Mendelson (1991) in their study of the Japanese market. In this market there are two call auctions, one at the open and one after a lunchtime closure. They found that returns from the lunchtime call displayed higher pricing efficiency than returns generated from either the morning or afternoon closures or the opening call auction.[1] The benefits of a call auction were also noted by Amihud et al. (1990) who showed that volatility associated with continuous trading on the Milan exchange was higher when continuous trading was not preceded by a call auction. Moreover, when Paris Euronext introduced a closing call auction in two tranches during 1996 and 1998. Pagano and Schwartz (2003) discovered

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[1] As French and Roll (1986) showed trading that follows a market closure will be associated with higher volatility. This means that prior studies that examined the opening call auction were unable to disentangle the effects of the open from the effects of the call mechanism.

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that this change led to a reduction in execution costs and an enhancement to price discovery.[2] This finding was supported by both Ko et al. (1995) and Comerton-Forde et al. (2003) who examined the Korea and Singapore markets, respectively.

We estimate the partial adjustment model with noise of Amihud and Mendelson (1987) to obtain estimates of the partial adjustment parameter. This coefficient is a useful measure of market quality as it captures how quickly security prices adjust to new information. Using estimates of the intrinsic value obtained from the model we calculate pricing efficiency as the extent to which observed prices diverge from estimated intrinsic levels. Using these two metrics we gauge whether the introduction of the London closing call auction improved market quality.

We show that for participating securities, the introduction of the call auction in London improved market quality at both the close and the open. In contrast, there are not measurable improvements to market quality for control securities. When we segregate our sample into five groups based on pre-call trading activity we find that the securities in the least active group benefit most from the introduction of the call auction.

The remainder of this paper is set out as follows. Section 2 describes the trading system at the London Stock Exchange, Section 3 describes our measures of market quality, and Section 4 describes the methodology. Section 5 describes the data. Section 6 provides the results and Section 7 provides some conclusions.

2. The London trading system

As part of a major overhaul to its trading system on October 20, 1997, the London Stock Exchange introduced an electronic auction system called SETS. During official trading time transactions for designated stocks were to be routed through SETS. At the time the system was introduced only FTSE 100 stocks were transferred to auction trading but during September 1999 the most active FTSE 250 stocks also migrated.

The initial performance of SETS was controversial as less than half of all eligible orders were being routed through SETS. Moreover, it was noted that security returns experienced high volatility at the start and end of the trading day because of low trading activity during these periods, see for example, Chelley-Steeley (2005). This was despite a reduction in trading costs and an increase in pricing efficiency noted by Taylor et al. (1990).

Recognition of problems associated with the open and close led the Stock Exchange to abolish minimum order sizes in June 1998 and to defer the market opening to 9.00 am in July 1998 (reversed in September of that year when the market began opening at 8.00 am). A further more substantial change saw a closing call auction introduced on May 30, 2000. This takes place at 4.35 pm after a five minute period during which orders can only be placed, amended or deleted.

Prior to the implementation of SETS, dealers were required to post firm two-way prices on SEAQ (Stock Exchange Automated Quotation System) during exchange opening hours. Dealers were also obligated to trade at prices no worse than those available on SEAQ. This system continued to operate for the vast majority of stocks after October 1997. Following the introduction of SETS market makers also continued to quote two way prices for SETS stocks but there was no longer a requirement for these quotes to be firm. This encouraged the development of a parallel dealer market operating alongside SETS that has been exceedingly successful in attracting order flow away from the official market as shown by Ellul et al. (2004). By examining each trade surrounding the London open and close Ellul et al. (2004) showed that only a small percentage of prices are being exclusively determined by the auction mechanism. Most are the result of some trading on the dealer market. Since a substantial amount of order flow is attracted away from official trading the closing call auction may have been less successful at improving market quality than has been the case in other markets.

3. Measuring market quality

The partial adjustment model with noise introduced by Amihud and Mendelson (1987) shows that observed security returns can be influenced by both noise and the failure of observed prices to adjust to intrinsic values immediately. This model is described in the following equations:

$$p_t - p_{t-1} = g(v_t - p_{t-1}) + u_t, \tag{1}$$

$$v_t = m + v_{t-1} + e_t, \tag{2}$$

$$2 > g > 0 \quad E(u_t) = 0 \qquad \mathrm{Var}(u_t) = \sigma_u^2,$$

where p_t is the logarithm of observed prices, v_t is the logarithm of the intrinsic value and u_t is a white noise sequence of pricing errors that reflect the influence of noise. The effect of u_t is to temporarily drive prices away from intrinsic values. Some potential causes of noise may be factors influenced by the trading system such as errors in the analysis and interpretation of information, market structure frictions and execution costs. The variance of noise is σ_u^2. The evolution of the intrinsic value v_t is assumed to follow a random walk with drift. The term m is the positive drift, e_t are a series of white noise random variables independent of u_t with a zero mean and finite variance that can be denoted as σ_v^2.

3.1. The partial adjustment process

The parameter g is a price-adjustment coefficient that reflects the movement of transaction prices towards the asset's intrinsic value. Its magnitude will be determined

[2] This improvement was achieved without having a detrimental impact on liquidity in the period immediately prior to the closing call.