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The effect of a closing call auction on market quality and trading strategies

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ABSTRACT

We study the effects of the introduction of a closing auction (CA) on the microstructure on the continuous trading phase in Borsa Italiana and Paris Bourse. We postulate and compare several empirical predictions based on both standard Kyle-type models and more recent models of limit order book. We find that while the CA has no effect during most of the day, its effect on the last minutes of trading is dramatic. We document a sharp decline in volume, associated with a significant reduction in spread and volatility, and an increase in aggressiveness of liquidity suppliers during the last minutes. We show that the differences in the Reference Price algorithm between Milan and Paris have a significant effect: the CA attracts greater volumes when the Reference Price is equated to the CA price.

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1. Introduction

Exchanges and regulators around the world pay much of attention to the process that determines the opening and the closing prices of securities traded in continuous electronic limit order markets. While an efficient opening mechanism is important for the price discovery process at the beginning of the trading day, an equally efficient mechanism of price formation is also necessary to guarantee

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Table 1

Market closing method and Reference Price algorithm in equity markets around the world in 2006.

Exchange	Closing call auction	Reference price determination	Comments
<i>US and North America</i>			
NYSE	Partly ^a	Last trade	
Nasdaq	Yes ^b	Closing Cross price	Cross introduced in April 2004
Toronto	No	Last trade	
<i>Europe</i>			
Bolsa in Madrid	Yes	Closing auction price	
Borsa Italiana	Yes	Weighted Average	VWAP of the last 10% of the daily volume including the CA
Paris Bourse (Amsterdam, Brussels, Lisbon, Paris)	Yes	Closing auction price	
London Stock Exchange (SETS)	Yes	Closing auction price	
Deutsche Boerse (Xetra)	Yes	Closing auction price	
OMX – Stockholm	Yes	Closing auction price	
OMX – Copenhagen	No	Last Trade	
OMX – Helsinki	No	Last Trade	
Oslo	Yes	Closing auction price	
Wien Börse	Yes	Closing auction price	
Zurich	Yes	Closing auction price	
<i>Other countries</i>			
Tokyo	Yes	“Itayose” method	Orders can be submitted from 12:05 to 14:59:59 and have no time priority
Hong Kong	No	Median	Uses the median of the last five transaction prices in the last minute of trading
Tel Aviv Stock Exchange	Yes	Weighted average	Chooses the smaller of: the weighted average of the transaction prices in the last half-hour of trading, and the weighted average of the prices of the pre-specified volume at the end of the day

^a At the NYSE the closing price is set by the specialist who collects market-on-close orders sent him in advance both by the Opening Automatic Report System (OARS), and by floor brokers. The OARS calculates trading volume and imbalances at each available price and the specialist chooses the clearing price that minimizes the market imbalance. The specialists can also post proprietary orders, or in case of price changes that look anomalous with respect to the previous closing price, he can halt trading and publicize information on the imbalance to attract new order flow. Notice that following the merger with Archipelago, NYSE stocks closing prices are also set at the NYSE Arca closing auction. The design of the Arca closing auction differs slightly from the European one as the closing price is set to maximize executable volume and if more than one price achieves this goal, than the system chooses the price that is closest to the previous closing price (<http://www.archipelago.com/traders/auction.asp>).

^b There are two differences between the design of the Nasdaq closing cross and the European closing auction: firstly, on the Nasdaq the pre-closing phase overlaps with the continuous auctions, whereas in Europe the pre-auction phase starts when the continuous section finishes; secondly, while the first two principles governing the price formation algorithm are the same as the European ones, the third and last one aims to minimize the distance of the equilibrium closing price with the prevailing best bid-ask midpoint.

that the closing price is as reflective of the fundamental value as possible. The closing price is important because it serves as the Reference Price (RP) for the settlement of financial contracts. Mutual and provident funds' NAV calculations, option expirations, and the entry of stocks into various indexes are generally based on the RP, as are most compensation contracts. Thus exchanges and regulators strive to ensure that the price formation mechanism at the end of the trading day is efficient and manipulation-resistant.¹

While most equity markets around the world are predominantly organized today as a continuous Limit Order Book (LOB), there is no uniformity in their closing mechanisms. Table 1 presents four basic mechanisms for closing the market and calculating the RP: some markets end the trading day with the last trade of the continuous phase, in which case the RP can be calculated as the price of the last trade,

¹ The closing prices are also of crucial importance for researchers using daily data in empirical Asset Pricing.

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