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Market structure, informational efficiency and liquidity: An experimental comparison of auction and dealer markets☆

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Abstract

We report the results of 18 market experiments that were conducted in order to compare the call market, the continuous auction and the dealer market. Transaction prices in the call and continuous auction markets are much more efficient than prices in the dealer markets. The call market shows a tendency towards underreaction to new information. Execution costs are lowest in the call market and highest in the dealer market. The trading volume and Roll's (Journal of Finance (1984) 1127–1139) serial covariance estimator are inappropriate measures of execution costs in the present context. The relation between private signals, trading decisions and trading profits is analyzed.

JEL classification: C90; G14

Keywords: Market microstructure; Informational efficiency; Liquidity, Bid–ask spread; Experimental asset markets

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1. Introduction

Growing competition forces stock exchanges to react to customer needs. The design of the trading mechanism is the most important determinant of market performance. The central issues are the computerization of the trading process and the choice between an order-driven and a quote-driven mechanism. This paper focusses on the second issue. Its purpose is to compare the principal alternatives, namely, the call auction, the continuous auction and the competitive dealer market.

Recent changes that occured in major European stock markets indicate that the issue of which trading mechanism is best suited is far from being resolved. For example, the London Stock Exchange replaced its quote-driven trading system with the electronic order-driven system SETS in 1997. On NASDAQ, public limit orders now compete with dealer quotations. In France and Germany, on the other hand, dealers were introduced to provide additional liquidity to the electronic continuous auction markets NSC and XETRA, respectively.

Continuous trading for less liquid stocks in the French CAC system (the predecessor of NSC) was replaced with two daily call auctions in 1992. On the other hand, the stocks listed on the French Nouveau Marché were transferred from a call market to the electronic continuous auction system in 1998. The London Stock Exchange considered to have less liquid stocks traded on SETS while, almost at the same time, Deutsche Börse AG announced that, for a number of less liquid stocks, continuous trading in XETRA would be replaced with call auctions. Call auctions are also frequently used to establish opening prices whereas closing call auctions and intradaily call auctions are less common.

This evidence suggests that more empirical research into the relative advantages of the principal trading mechanisms is needed. The existing empirical literature has mainly focussed on comparing the liquidity of continuous auction and dealer markets. The issue of informational efficiency has rarely been addressed. This is, to a large part, due to data limitations.

These limitations can be overcome in experimental research. In this paper we report the results of a series of 18 market experiments with a total of 216 participants. The experimental method allows to vary the trading mechanism under ceteris-paribus conditions. Different results can therefore be attributed to the design of the trading system. The asset value and the information each market participant holds is known to the experimenter. This allows to directly address the issue of informational efficiency. The experiments described in the present paper are designed in a way that enhances the comparability of the results to those obtained from field studies.

The findings can be summarized as follows. Consistent with the practice of many exchanges to start trading with a call auction, opening prices in the call market are closer to the true value of the asset than opening prices in the continuous markets. The difference to the dealer market is significant whereas