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Market composition and price informativeness in a large market with endogenous order types ☆

Edouard Challe [a,b,c,*], Edouard Chrétien [b]

[a] *Ecole Polytechnique (CNRS), France*
[b] *CREST, France*
[c] *Banque de France, France*

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Abstract

We analyse the joint determination of price informativeness and the composition of the market by order type in a large asset market with dispersed information. The market microstructure is one in which informed traders may place market orders or full demand schedules and where market makers set the price. Market-order traders trade less aggressively on their information and thus reduce the informativeness of the price; in a full market-order market, price informativeness is bounded, whatever the quality of traders' information about the asset's dividend. When traders can choose their order type and demand schedules are (even marginally) costlier than market orders, then market-order traders overwhelm the market when the precision of private signals goes to infinity. This is because demand schedules are substitutes: at high levels of precision, a residual fraction of demand-schedule traders is sufficient to take the trading price close to traders' signals, while the latter are themselves well aligned with the dividend. Hence, the gain from trading conditional on the price (as demand-schedule traders do) in addition to one's own signal (as all informed traders do) vanishes.

JEL classification: G11; G14

Keywords: Market microstructure; Price informativeness; Market orders

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* Corresponding author at: Ecole Polytechnique, Department of Economics, 91128 Palaiseau, France.
E-mail addresses: edouard.challe@gmail.com (E. Challe), edouard.chretien.2008@polytechnique.org (E. Chrétien).

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1. Introduction

We analyse the joint determination of price informativeness and the composition of the market by order type in a large, competitive asset market with dispersed information. The market microstructure we consider is one in which informed traders may place either full demand schedules or more basic *market orders*, i.e., order to sell or buy a fixed quantity of assets unconditional on the execution price.[1] There are also "noise" traders who prevent the asset price from being fully revealing whenever the precision of private signals is bounded, as in, e.g., Grossman and Stiglitz [7,8], Diamond and Verrecchia [6] and others. After informed and noise traders have placed their orders, the trading price is set by a competitive, utility-maximising market making sector. We characterise the trading intensities associated with each order type, the *ex ante* utilities that they generate for the concerned traders (hence their preference for a particular type of order), and ultimately how the composition of the market interacts with the informativeness of the price.

We first consider the case where *exogenous* measures of demand-schedule and market-order traders coexist in the market. In a pure market-order market (as in, e.g., Vives [16]), the informativeness of the price is bounded above, however precise private information about the dividend is. In contrast, whenever demand-schedule traders are in positive mass the informativeness of the price is unbounded as the quality of private information goes to infinity. The reason for this difference lies in the way private information is incorporated into the price in either case. Because market-order traders face price risk – since their orders are unconditional on the effective trading price –, they trade less aggressively on their private information than demand-schedule traders, which reduces the informativeness of the price. In contrast, demand-schedule traders are insulated from price risk, so their trading intensity grows without bound as their private information becomes infinitely precise; in the limit, they perfectly align the trading price of the asset with the dividend (formally, the trading price is at least as informative of the dividend as the signals received by informed traders, and sometimes more).

Motivated by these observations, we examine informed traders' choices of order type and the impact of these choices on the composition of the market and the informativeness of the price. Since demand schedules are more complex than market orders (due to the full conditionality of the amount of trade on the price), we assume that they are more costly, at least marginally. Our main result is that, when the precision of private signals is large, then *the equilibrium is necessarily interior* (i.e., market-order and demand-schedule traders are both in strictly positive measures), but *market-order traders overwhelm the market* (i.e., their measure tends to one as precision goes to infinity). In other words, when the quality of information is high, the gain from conditioning one's trades on the price (as demand-schedule traders do) in addition to conditioning on one's own signal only (as market-order traders do) vanishes – and thus falls short of the cost, however small, for most traders.

There are two potential reasons for which this could be the case, and it is the purpose of the information structure that we assume – with potentially correlated noise in the signals received by informed traders – to disentangle them. First, knowledge of the price could become less and less valuable because one's own signal becomes more and more aligned with the information of others as the quality of private information improves (since *all* signals then get closer to the true value of the dividend). In other words, the advantage of acquiring information about

[1] See Brown and Zhang [4], Wald and Horrigan [17] and Vives [15] for further discussion of the importance of market orders in actual asset markets.