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Algorithmic Trading Patterns in Xetra Orders

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Abstract

Computerized trading controlled by algorithms – “Algorithmic Trading” – has become a fashionable term in investment banking. We investigate a set of Xetra order data to find traces of algorithmic trading by studying the lifetimes of cancelled orders. Even though it is widely agreed that an algorithm must randomize its order activities to avoid exploitation by other traders, we still find systematic patterns in the submission and cancellation of certain Xetra orders, indicating the activity of algorithmic trading. The trading patterns observed might be interpreted as fishing for profitable roundtrips.

Keywords:

Market microstructure | algorithmic trading | cancellations | order lifetime | Xetra

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Notes

1. The time span from the moment an order is generated in the electronic system of an exchange member to the time when a confirmation signal from the exchange arrives back at the order submitter is called roundtrip time.

2. In our dataset containing all order entries of all DAX-30 stocks between 8 and 15 December 2004 and between 5 and 12 January 2005, such a volatility break occurred only twice.

3. For a treatment of cancellations with lifetime lesser or equal two seconds, see Hasbrouck and Saar (2005).

4. Intuitively, kernel density estimates can be understood as histograms with infinitely fine classes smoothed by moving averages. Formally, kernel density estimates are functions of the form

where K is the kernel function. For all plots in this paper, Gaussian kernels were used, i.e., all kernel density plots use the formula

For an extensive comparison of the properties of different kernels see Hwang et al. (1994).

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