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Optimal Order Placement in Multiple Limit Order Markets

(joint work with Rama Cont)

Abstract: When executing a trade, participants in electronic equity markets can choose to submit limit orders or market orders, as well as sizes and destinations of their orders, if a stock is traded on several exchanges. This decision is influenced by order flow characteristics and queue sizes in each limit order book, as well as a structure of transaction fees and rebates across exchanges. We formulate the search for trader's optimal order placement policy as a convex optimization problem, solve it and study how the interplay between the state of order books, the fee structure, order flow properties and preferences of a trader determine an optimal placement decision. In a case when one exchange is used for order execution we derive an explicit solution for optimal limit and market order sizes.

We also propose and test a stochastic algorithm for solving this problem in a general order placement setup with multiple exchanges.