Modelling Limit Order Execution Times from Market Data AD-LAR KIM, Massachusetts Institute of Technology, MA / Santa Fe Institute, NM, DOYNE FARMER, Santa Fe Institute, NM, ANDREW LO, Massachusetts Institute of Technology — Although the term "liquidity" is widely used in finance literatures, its meaning is very loosely defined and there is no quantitative measure for it. Generally, "liquidity" means an ability to quickly trade stocks without causing a significant impact on the stock price. From this definition, we identified two facets of liquidity – 1.execution time of limit orders, and 2.price impact of market orders. The limit order is an order to transact a prespecified number of shares at a prespecified price, which will not cause an immediate execution. On the other hand, the market order is an order to transact a prespecified number of shares at a market price, which will cause an immediate execution, but are subject to price impact. Therefore, when the stock is liquid, market participants will experience quick limit order executions and small market order impacts. As a first step to understand market liquidity, we studied the facet of liquidity related to limit order executions – execution times. In this talk, we propose a novel approach of modeling limit order execution times and show how they are affected by size and price of orders. We used q-Weibull distribution, which is a generalized form of Weibull distribution that can control the fatness of tail to model limit order execution times.

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