

Would Order-By-Order Auctions Be Competitive?

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- ▶ Extension 1: institutional investors
- ▶ Extension 2: heterogeneous assets
- ▶ Data: Retail liquidity programs

Baseline model

- ▶ Two dates $t = 0, 1$, no discounting
- ▶ Three types of risk neutral agents
 1. **Retail investor:** trades for liquidity reasons (no information), fixed scale trade
 2. **Broker:** maximizes investor's welfare
 3. **Market Makers:** $N > 3$ ex-ante identical
 - ▶ Idiosyncratic liquidity shock and random inventory costs
- ▶ MMs compete for the investor's order in a first-price, sealed-bid auction, bid s_i
 - ▶ Broker's routing: MMs see a signal of their own liquidity shock before bidding
 - ▶ Order-by-order: MMs observe their own liquidity shock before bidding

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- ▶ **Information frictions**
 - ▶ Asymmetric information \Rightarrow Winner's curse
 - ▶ Incomplete information about own liquidity shock \Rightarrow Inefficient allocations

Liquidity and Inventory Costs

- ▶ Idiosyncratic liquidity shocks

$$y_i \sim U \left[-\frac{1}{2}, \frac{1}{2} \right]$$

- ▶ Random inventory costs

$$\zeta_i = \underbrace{c_0}_{\text{constant}} + c_1 \underbrace{\frac{1}{N} \sum_{j=1}^N y_j}_{\text{common}} + \underbrace{c_2 y_i}_{\text{private}}$$

- ▶ $c_1 = 0$: Private value auction (no winner's curse)
- ▶ $c_2 = 0$: Common value auction

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- ▶ Winner's curse is more severe when information asymmetry is larger (more precise signals)

Efficiency and Welfare

- ▶ **Allocative efficiency**

- ▶ **Broker's routing** Inefficient allocation: MM with lowest inventory cost ex-post may not win
- ▶ **Order-by-order** Efficient allocation: MM with lowest inventory cost wins the bid

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- ▶ Two effects on bids in Order-by-Order
 1. More precise information \Rightarrow More aggressive bids
 2. Stronger winner's curse \Rightarrow Less aggressive bids - "less competition"

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- ▶ Can have Pareto improvements if

- ▶ signals are precise enough in broker's routing or
- ▶ aggregate liquidity matters a lot or
- ▶ competition among market makers is high

Comments/Suggestions

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5. What makes a market more competitive? Bid level? Not clear BR is more competitive than BOB.