

Retail Order Flow Segmentation

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The views expressed in this presentation are those of the authors and not of the Bank of Canada.

Minnows and not sharks...

Market structures try to separate the “minnows” from the “sharks.”

- ▶ Broker internalization, payment for order flow, ping networks

More recently, **exchange-based segmentation of retail orders.**

- ▶ Does this benefit one class of trader while harming others?

This paper: segmentation can improve overall liquidity and price efficiency

We study the NYSE's Retail Liquidity Program (RLP)



Non-retail
traders



The tension: is non-retail worse off?

NYSE RLP launch an useful instrument: It intercepts retail orders in the “waterfall”

| Venue | Taker fee |
|-----------------|-----------|
| Two Sigma | -18 |
| UBS | -15 |
| KCG | -11 |
| Goldman Sachs | -10 |
| Citadel | -9 |
| BATS Y | -5 |
| Direct Edge A | -4 |
| NYSE RLP | 0 |
| NYSE | 25 |
| BATS Z | 29 |
| NYSE Arca | 30 |
| Nasdaq | 30 |
| Direct Edge X | 30 |

What does theory predict?

We test four hypotheses motivated by Zhu (2014).

1. The RLP order flow is less predictive of future prices.
2. Segmentation improves the ability the total order flow to predict future prices.
3. Participation in the RLP affects a stock's liquidity.
4. Participation in the RLP affects a stock's price efficiency.

Data and methodology

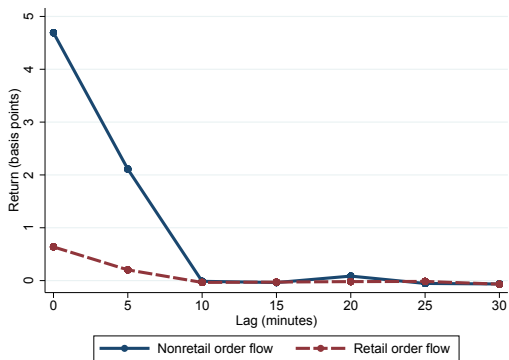
Data

- ▶ Trades and quotes for NYSE, NYSE Arca traded stocks April 2012 to August 2013
- ▶ RLP trades are identifiable ($\sim 3.5\%$ of volume for sample stocks)

Methodology

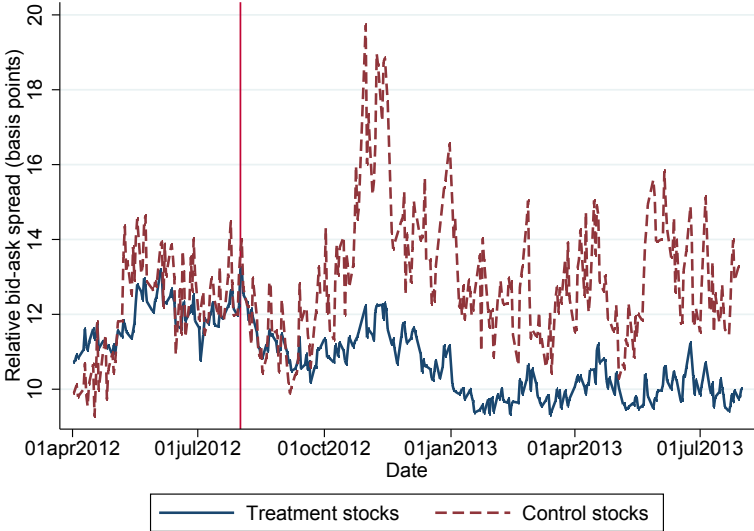
- ▶ How do segments of the order flow predict future prices?
 - ▶ Structural vector autoregression (VAR) (Hasbrouck 1991)
- ▶ How does RLP affect market quality?
 - ▶ Difference-in-differences event study

Segmentation improved informativeness of the order flow



| Component of order flow | Return variation explained | Difference |
|-------------------------|----------------------------|------------|
| Aggregated | 26.27% | |
| Disaggregated | 27.77% | 1.50%*** |

Bid-ask spreads narrowed



Difference-in-differences: market quality improves

$$\text{market quality}_{i,t} = \beta \text{treatment}_{i,t} + \gamma \text{after}_t + \delta X_i + FE_i + \varepsilon_{i,t}$$

| Measure | β no control variates | β including control variates |
|------------------------|-----------------------------|------------------------------------|
| Relative spread (bps) | -1.987*** | -0.653* |
| Effective spread (bps) | -0.938*** | -0.244 |
| Price impact (bps) | -0.627*** | -0.456*** |
| Autocorrelation | -0.012** | -0.008** |

- ▶ Control variates (X_i): market cap, volume, volatility, 1-day lagged market quality, market-wide factor

Conclusions

We analyze market quality before and after the launch of NYSE's RLP.

- ▶ Retail segmentation improves ability of the order flow to predict future prices.
- ▶ Improved price efficiency improves overall liquidity
 - ▶ The result is robust: subsampling, alternate controls, placebo test on RLP launch date

Our result is contrary to some theory on segmentation.

- ▶ We might be misunderstanding segmentation because of a failure to consider dynamics.