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# Speed segmentation on TSX Alpha

## Preliminary findings

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# Disclaimer

- Views presented here are the researchers' own and do not necessarily reflect those of the Bank of Canada or IIROC.
- All errors are our own.

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# Some equity trading venues are slowing down traders with "speed bumps"

- Speed bumps delay marketable orders before they interact with the limit order book
  - TSX Alpha in 2015
- Alpha is designed to attract "slow" liquidity takers
  - "Speed segmentation"
- Our findings:
  - No evidence Alpha harms overall market quality
  - Execution size on Alpha is larger

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# TSX Alpha's redesign – 21 Sept 2015

- TMX Group: "Provide superior, domestic execution for active natural order flow."
  - 1-3 millisecond delay
  - *Post-only* orders of *minimum size* are exempt
  - Inverted fees
  - Unprotected status
  - TMX decommissioned another venue, TMX Select
- Alpha captures around 6.5% volume share
  - Relatively high concentration of active retail, passive HFT
- We evaluate the **net effect** of these changes on overall Canadian market quality.

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# Overall impact: difficult to predict

| **Work on speed bumps** | |
|---|---|
| Chen, Foley, Goldstein and Ruf (2016):<br>• Adverse selection costs increase on other exchanges. | Harmful |
| Brolley & Cimon (2017, mimeo):<br>• Adverse selections costs may increase or remain unchanged on other markets. | Depends on length of the delay |

| **Work on retail segmentation** | |
|---|---|
| Battalio (1997), Weaver (2011), etc. | Mixed |

# Study design and data

- IIROC Data
  - Trades, orders and quotes; broker and user identification
  - TSX Composite securities, July–Nov 2015
  - Classification of participant IDs (IIROC, 2014)
- Overall market quality: Difference-in-differences
  - US stocks as controls (NYSE TAQ data)
  - Measures: effective spread, price impact
- Institutional trading costs
  - Implementation shortfall using participants IDs
- Market quality for Alpha users
  - Cross-sectional user ID and trading venue comparison

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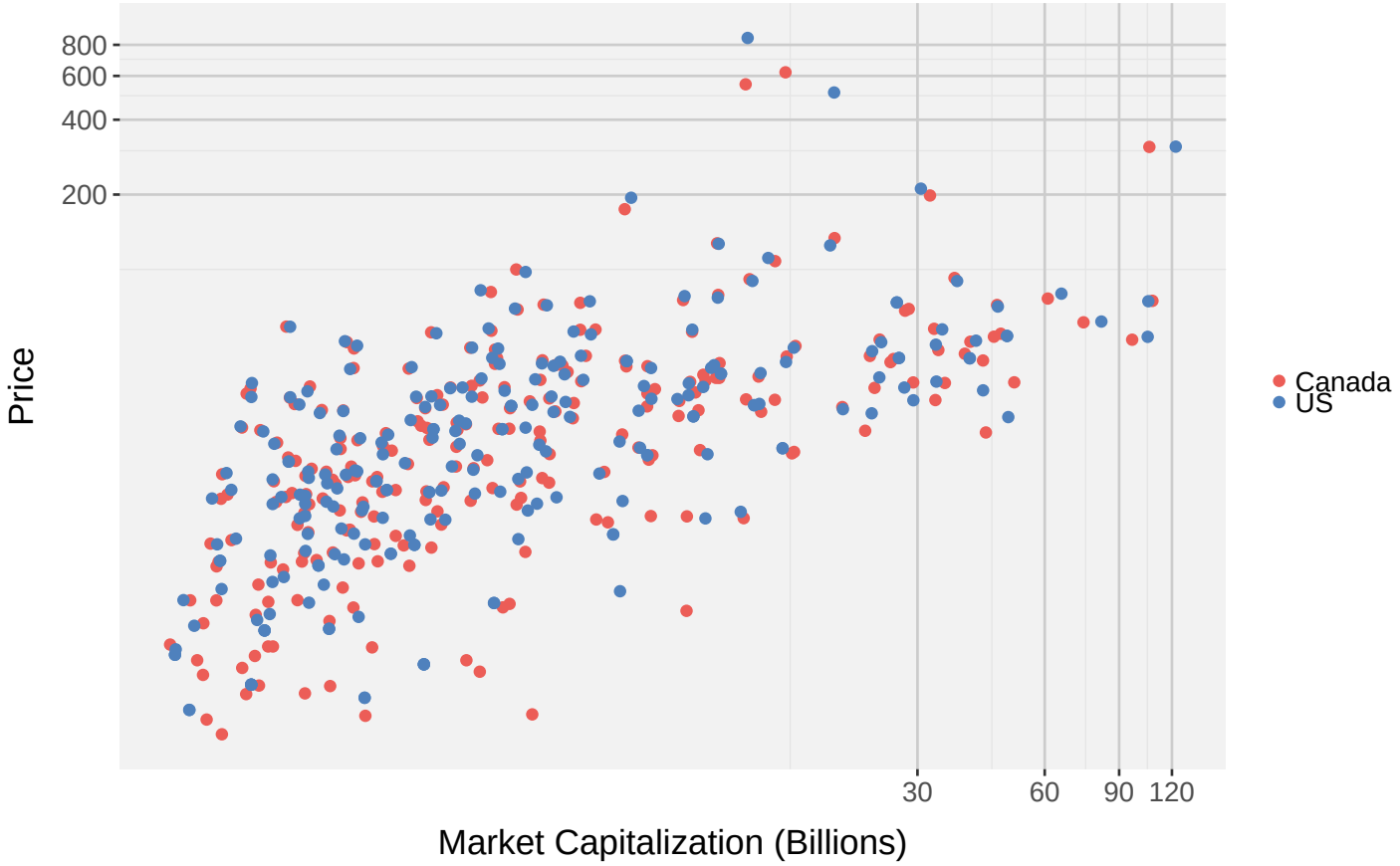
# US stocks make a good control sample




- Stocks matched one-to-one on price and market cap (Davies and Kim 2007)

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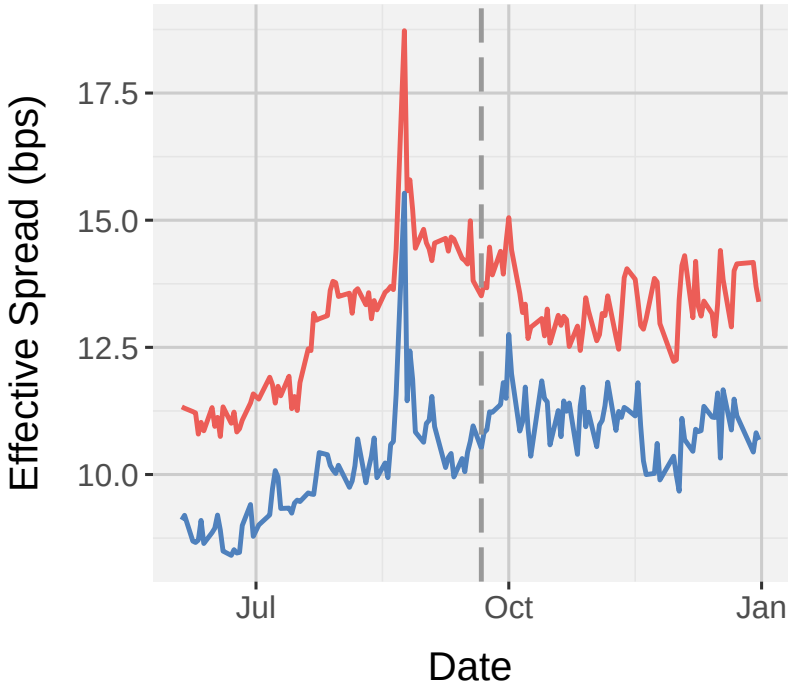
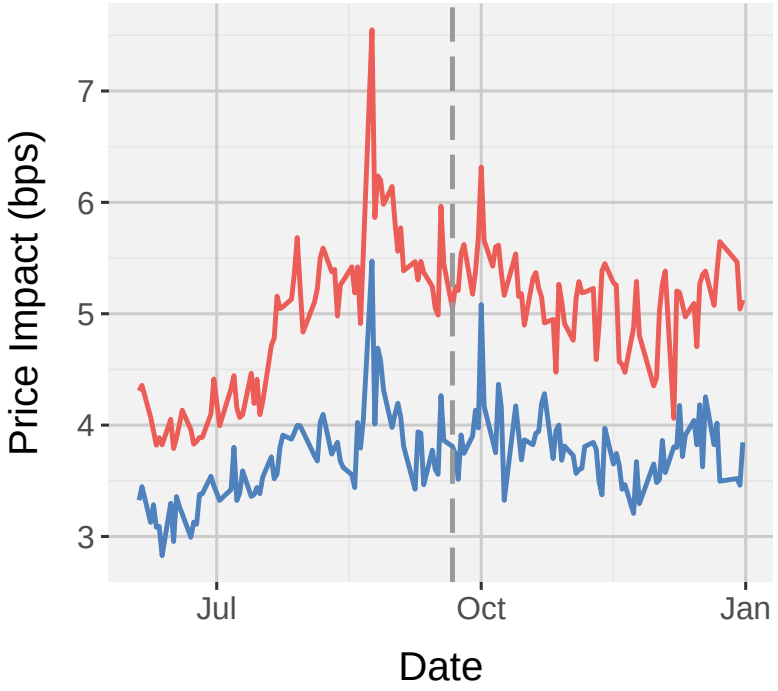
# US stocks make a good control sample




- Regression: $MQ = \beta * treatment + \alpha * after + \gamma * controls + \delta * FE + \varepsilon$

- Controls: volume, volatility, lagged MQ
- FE by stock; standard errors clustered by stock, date

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# The effect of Alpha: no evidence of harm

| | All trading venues | | |
|---|---|---|---|
| | Effective Spread (bps) | Price Impact (bps) | Implementation Shortfall (bps) |
| Post dummy | -0.15 | -0.052 | 3.1 |
| …with controls | -0.14 | -0.093 | 2.5 |
| …with US | -0.52*** | -0.079 | Not available |

| | Traditional maker-taker (TSX, CHX, AQL, LYX) | |
|---|---|---|
| | Effective Spread (bps) | Price Impact (bps) |
| Post dummy | 0.07 | -0.11 |
| …with controls | -0.06 | -0.16 |
| …with US | -0.41** | -0.13 |

- Results for ETFs are similar

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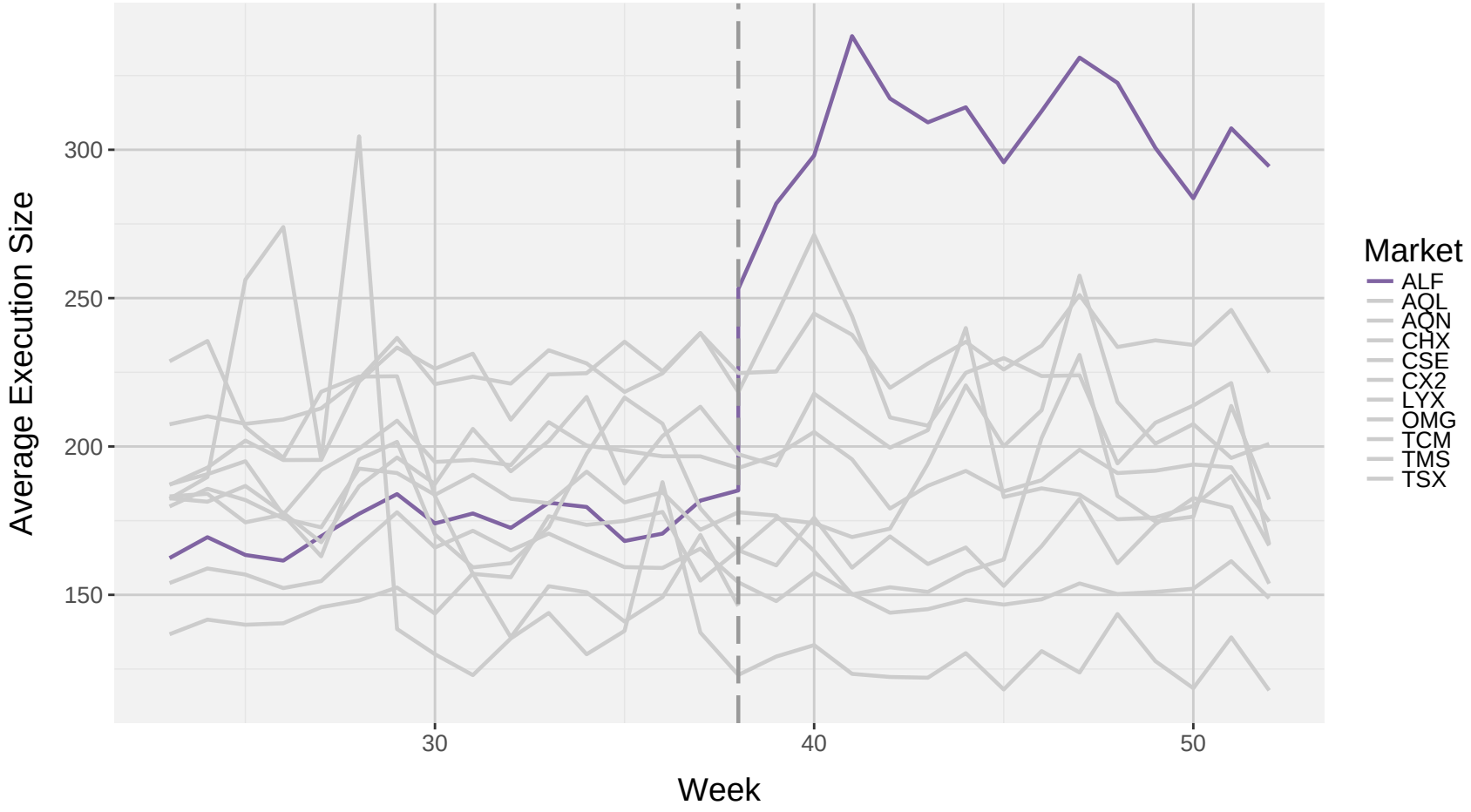
# Why do brokers choose to route to Alpha?



# Conclusions

- Alpha composition is as expected
  - Relatively high concentration of active retail, passive HFT
- No evidence Alpha harmed overall market quality
- Why do brokers choose Alpha?
  - Execution sizes are larger
  - A way to compete or something brokers pay for?