Drivers and Effects of Stock Market Fragmentation - Insights on SME Stocks

Associate Professor Sean Foley

Macquarie University, Sydney, Australia

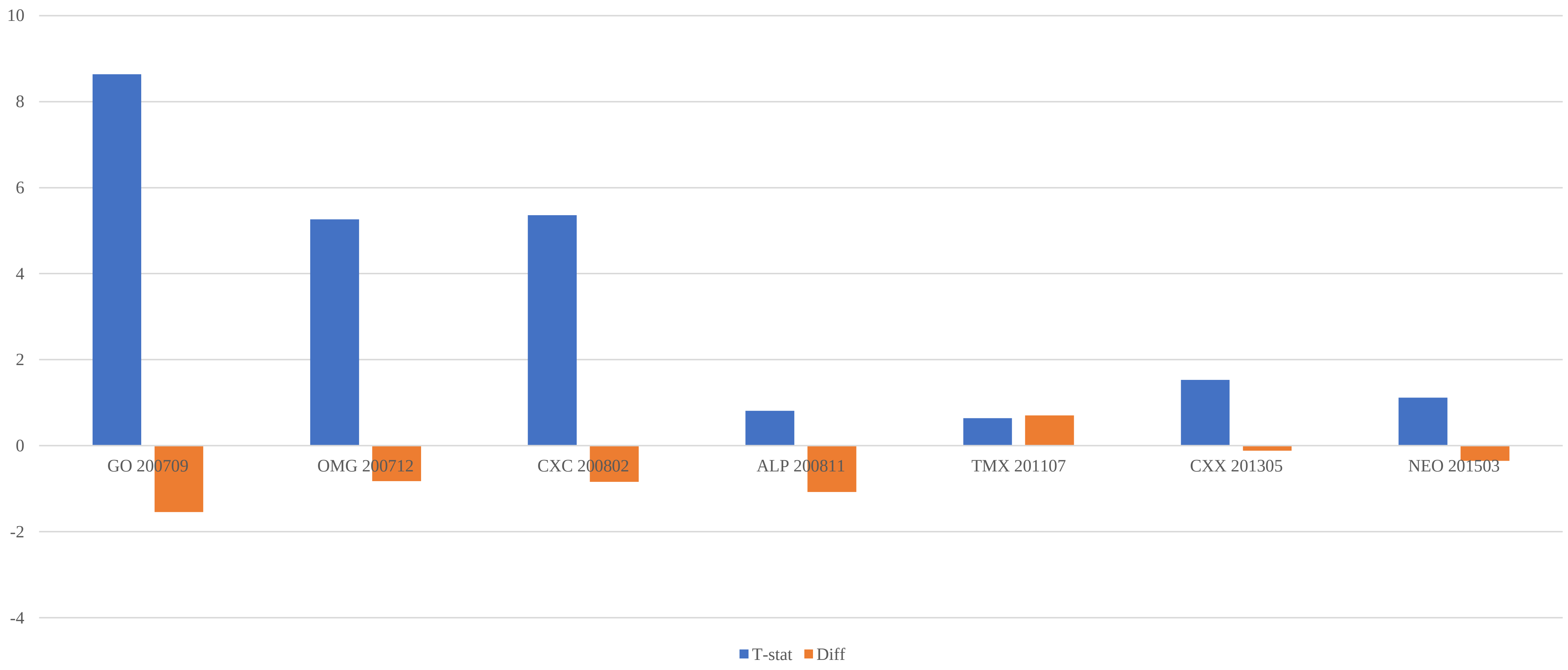
Fragmentation – Cause and Effect

- Reg NMS in the USA, MiFID in Europe, endogenous globally
- National exchange monopolies historically overcharged with limited innovation
- Introduction of competition has been found to reduce explicit fees
- Competition also facilitated cross-exchange competition:
  - Reducing Spreads
  - Increasing Depth
- However, increased fragmentation comes with costs:
  - Connectivity Costs
  - Smart Order Routing
  - Data Fees

Main Takeaways

- Fragmentation is not exogenous
- Larger, more liquid stocks more likely to be chosen to trade
- Fragmentation negative / indifferent for smaller stocks
- Fragmentation positive for larger stocks

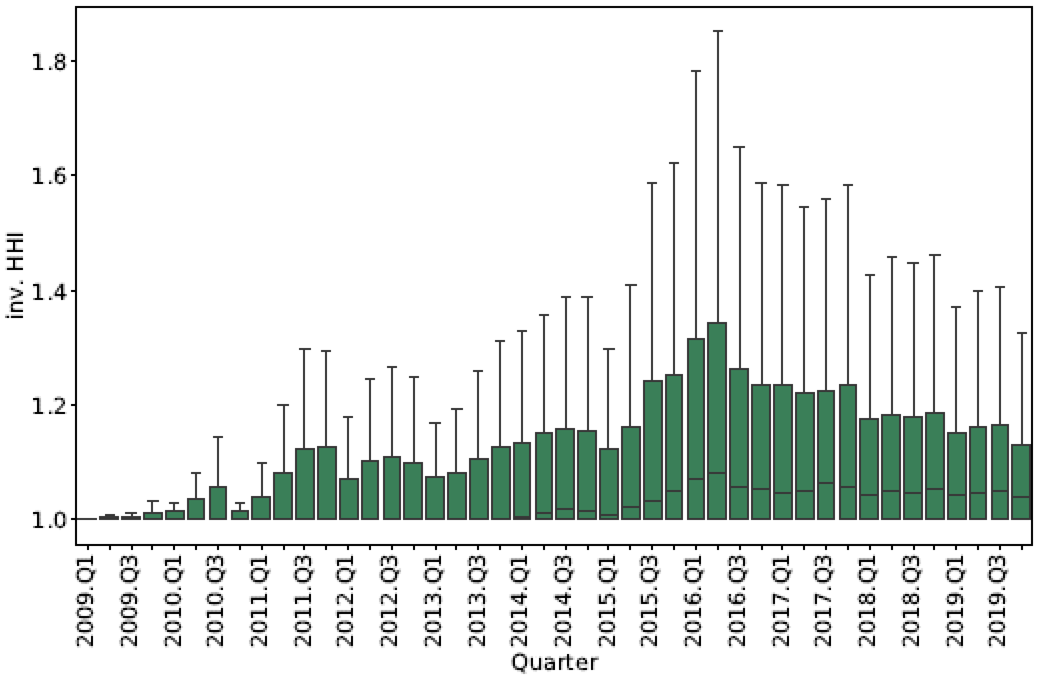
How many venues are beneficial? Canadian evidence Foley, Jarnecic, Liu (2021)



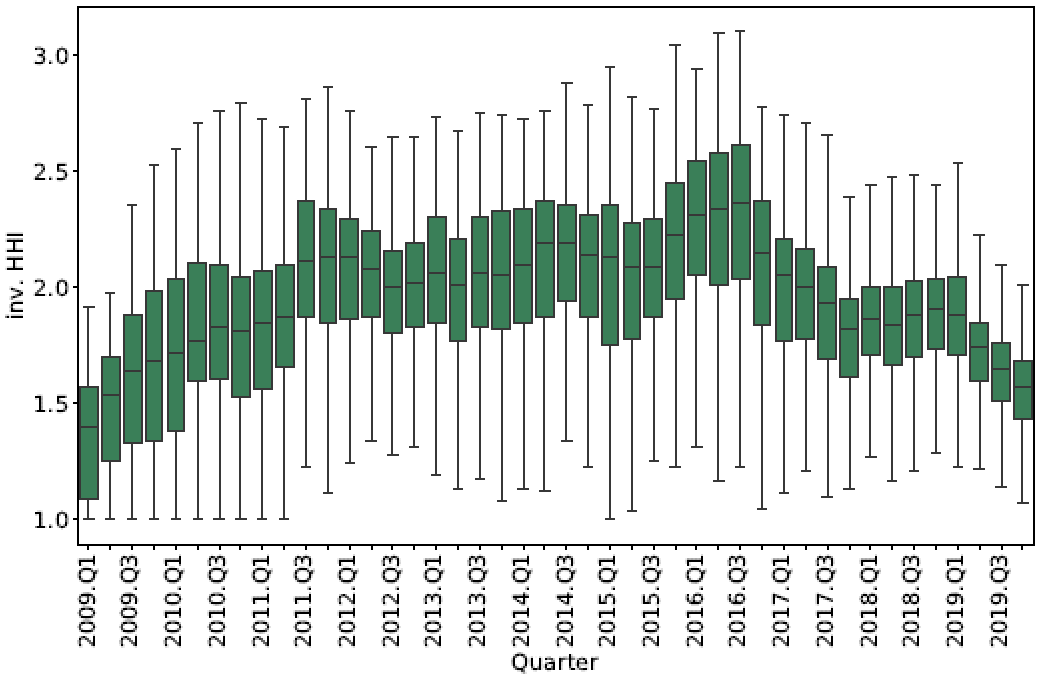
How should we measure fragmentation?

$$inv.\ \ HHI_{i,t} = 1/(\sum_j s^2_{j_{i,t}})$$

- With 5 markets maximum at 20% per exchange = 5
- Analysed levels closer to 1.05 for SMEs
- Does this allow us to generalize results?



(a) SME stocks



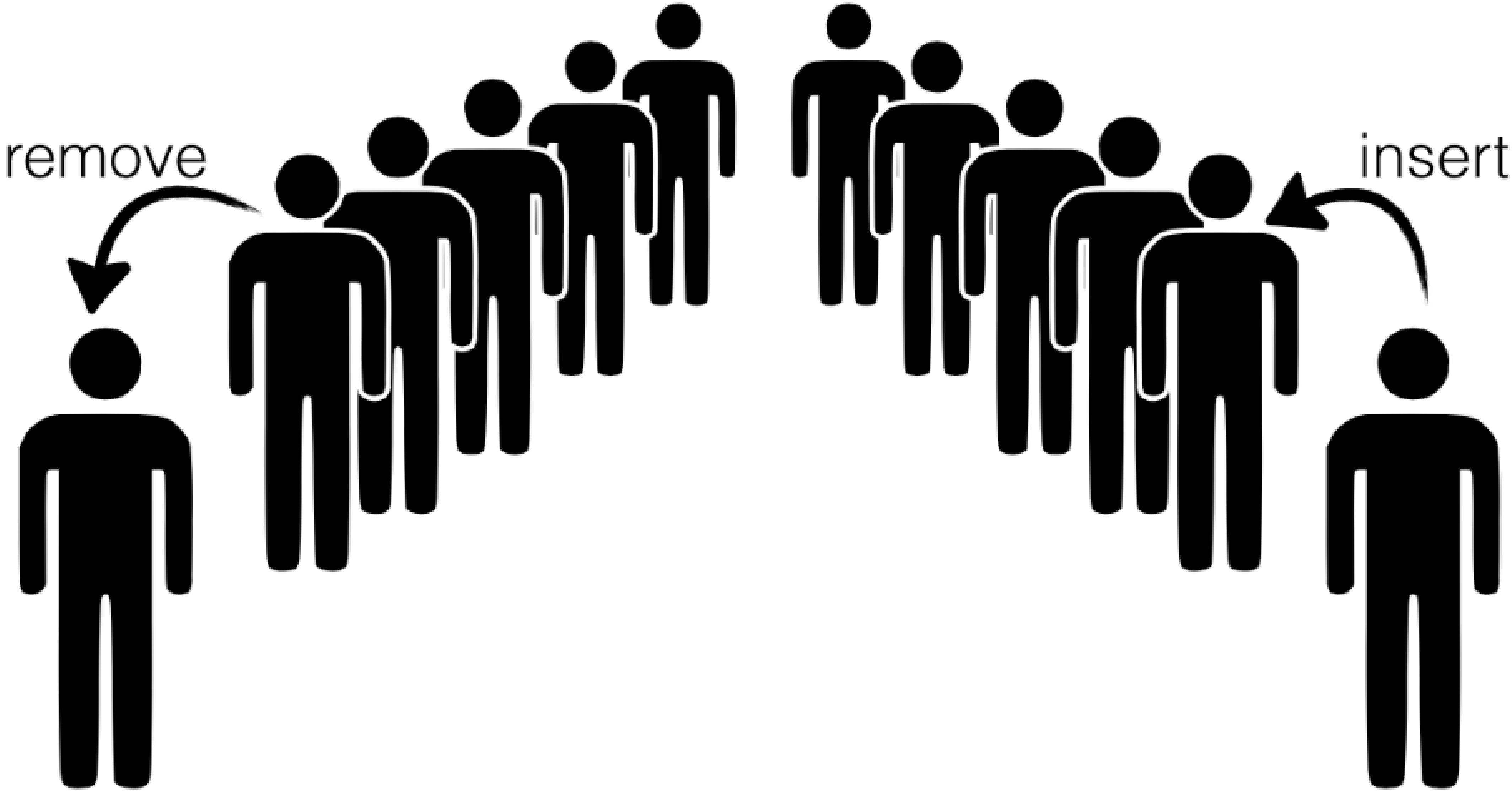
(b) Non-SME stocks

Measurement of Fragmentation

- Different ways one could measure fragmentation
  - (ie Aitken, Chen, Foley, 2016)
- Date on which fragmentation became possible
- % traded in alternate exchanges
- % Pre-trade (quoted) vs Post trade
- Rolling fragmentation before today (ie last 30 days)
- Threshold of trading (ie > 5% =1, else 0)

What causes fragmentation?

Given long queues
Two friends join different lines…



Queue Jumping causes fragmentation

- Queue jumping arises endogenously
- Shorter queues are always preferred
- They generate less adverse selection than the back of a long queue
- Foucault + Menkveld (2008), Foley, Jarnecic, Liu (2021)

Panel A: inv. HHI

	SME stocks				Non-SME stocks			
	Observations	inv. HHI	euro-volume	mcap	Observations	inv. HHI	euro-volume	mcap
10	6538	1.01	1.41	105.87	240	1.02	26.26	3116.94
80	9942	1.04	5.50	179.57	449	1.04	11.65	3425.02
600	6827	1.20	26.03	377.15	1362	1.31	70.14	1530.06
2000	1717	1.58	96.88	599.08	3319	1.71	127.28	2198.97
9000	363	1.77	231.52	821.48	7290	2.06	597.61	5585.38
inf	-	-	-	-	4126	2.09	2803.02	31640.31

Trade Through vs Best Ex

Foley, Jarnecic and Liu (2021) show more liquid stocks endogenously fragment to alternate venues due to the benefits of queue jumping

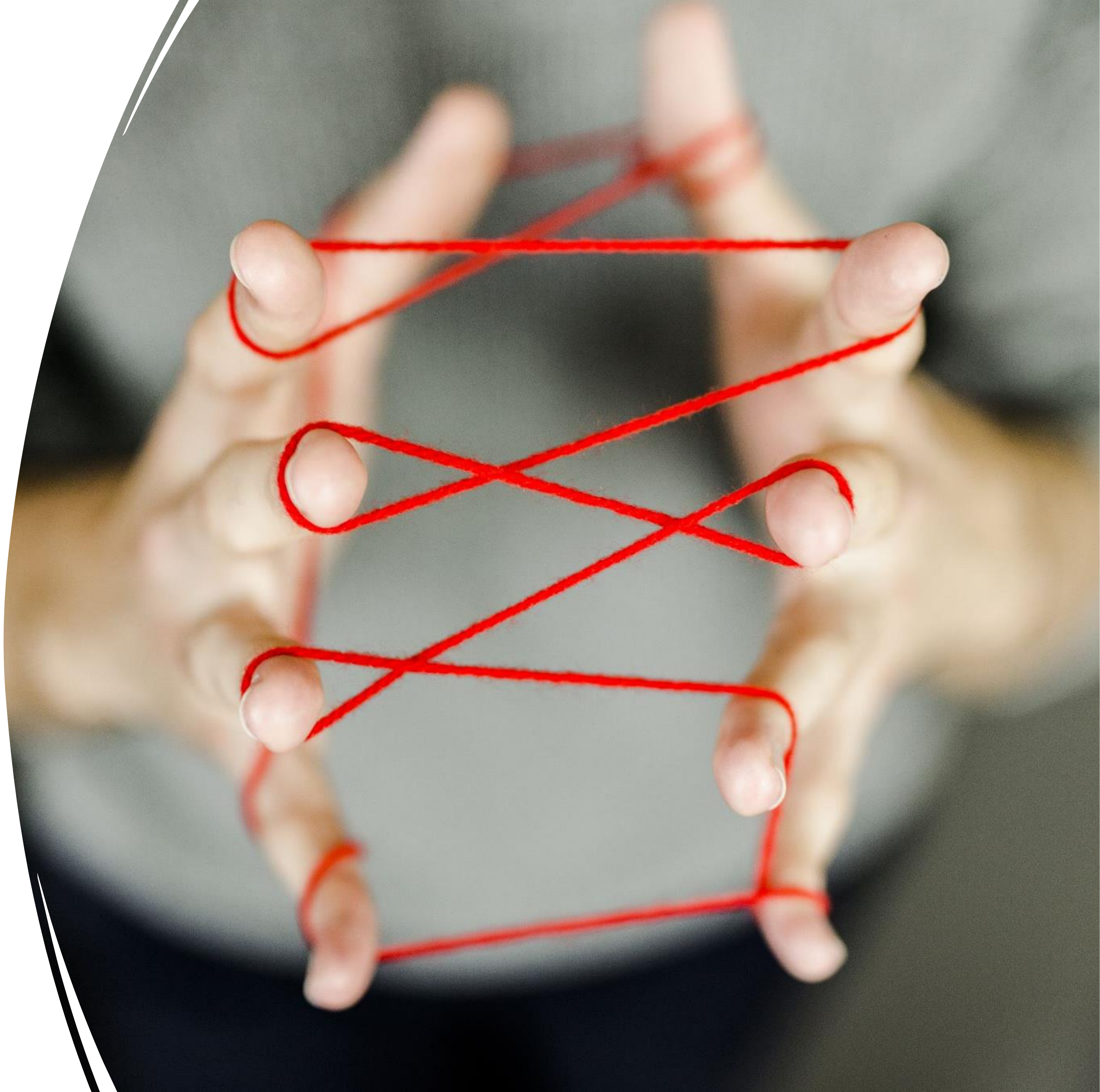
Joining an alternate (shorter) queue can result in higher probability of fill, and lower adverse selection

Trade through prohibition encouraged traders to use the alternate venues

Even absent trade through, traders used alternate venues frequently for more liquid securitites > increased probability of execution

Implications for this research

- Queue Size (Depth) and tick constraint are significant drivers of exogenous fragmentation.
- These should be explicitly considered in the modelling of the drivers of fragmentation
- This will likely help explain the low levels of fragmentation amongst SMEs



What are the impacts of fragmentation?

More venues to trade on can increase search costs

This is bad for less liquid stocks

These are mostly mitigated by SORs (for larger stocks)

Depends on how you measure it?

Fragmentation may worsen market quality for the primary exchange, but improve it in aggregate
(ie Foley, Meling, Odegaard, 2022)

Policy Implications

- Paper states fragmentation should be encouraged because:
    - Benefits for large stocks
    - No disadvantages for SMEs
- This depends critically on how fragmentation is measured
    - Better for general market participant?
    - Better for Primary Exchange?
    - Better for Alternative Exchange?
- Ideally would measure the impact for aggregate liquidity