Resiliency
Kempf, Mayston, Gehde-Trapp and Yadav

A Discussion

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Relevance of the Topic

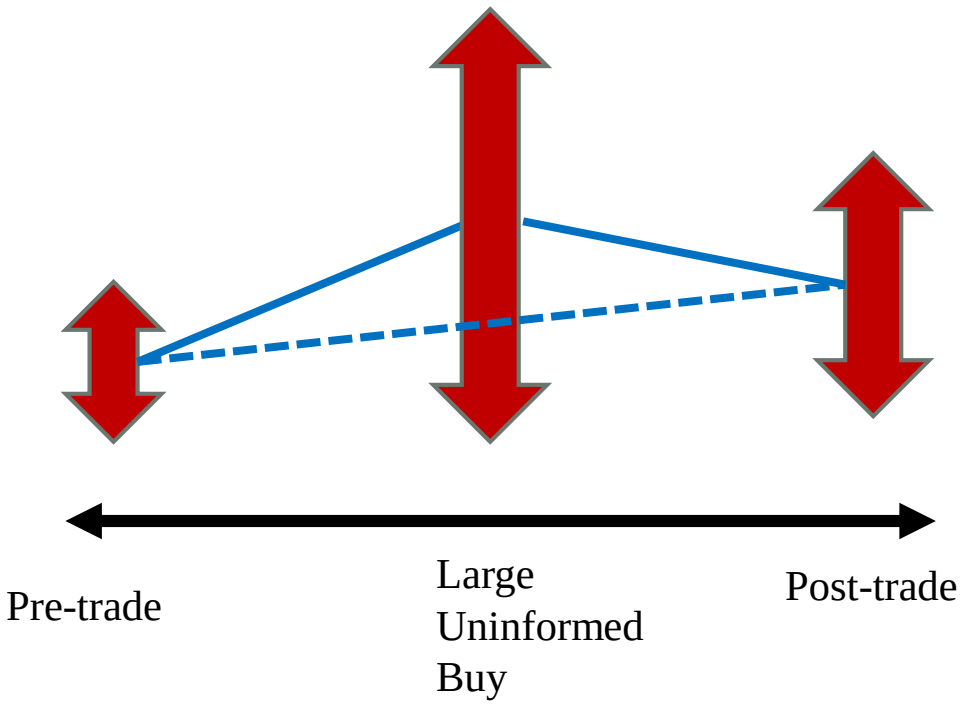
- Extremely important in the post-algo world
  - Relevant to regulators/markets
    - When liquidity provision is voluntary (no affirmative obligations)
      - How much do algos exacerbate shocks?
      - How fast does liquidity reappear after shocks?
  - Relevant to practitioners too
    - Order scheduling is a big deal for algos (How to trade a large order over time?)
- Authors make a very good attempt to capture resiliency and its impact

What is Resiliency?

- Standard theoretical construct
  - Trader can be informed or uninformed
  - Prices move after a trade
    - Informed trade – remain at the new level
    - Uninformed trade – come back to the old level
  - Resiliency → speed at which prices come back to the old level after a large uninformed trade

- Literature definitions
  - Garbade → 'new orders come in quickly to restore any order imbalance that may have skewed *prices*'
  - Kyle → 'speed at which *prices* tend to converge to pre-liquidation value'
  - Harris → 'how quickly *prices* revert to former levels after they change in response to a large (uninformed) order flow'
  - Foucault, Kadan and Kandel → 'probability that, after a liquidity shock, the *spread* reverts to its former level before the next transaction'

A Simple Example



Prices increase but so do spreads → relative spreads may therefore remain unchanged

Is the market resilient?

- No (Harris/Kyle)
- Yes (this study)

Resiliency Measure

- Use a mean-reverting process (Ornstein-Uhlenbeck) structure
  - (Current Liq – Past Liq) = Resiliency * (Long-run Liq – Past Liq) + error
  - How fast does the market move towards the long run average?
  - Half-life of resiliency → Ln(2)/resiliency measure

Key Things About Market/Data

- LSE
  - Market share around 60% during the sample period
  - Smart order routing – getting the best price was only a fiduciary responsibility and not mandated by regulation like RegNMS in the US
- Large and liquid stocks (FTSE 100)
  - Tick sizes could be binding (frequency distribution of absolute spreads in ticks could be an interesting chart to see)
  - Some are cross-listed in other markets
- Market structure
  - Tick size – step function on price level
  - Trade size compression (distribution of trade sizes?)
  - Hidden and pegged order availability
  - Auto-refresh capabilities of order routing engines
  - Great level of pinging/cancellations making quotations not too representative of actual conditions
- Order book data
  - 5-min order book snapshots

General Comments

- To truly test resiliency (and FKK paper) we may need to examine stocks/days where informed trading is less likely
- Analysis during financial crisis
  - Effect of short selling bans

Minor Comments

- Smaller tick size lowers spreads and not raise spreads as alluded to in the paper (p.19)
- Half-life computation (p.13)
- All equations in paper are numbered as 0
- A new paper by Clapham et al (2015) on HFT role in order book resiliency