Discussion of “Instability of Centralized Markets”
by Ahmad Peivandi and Rakesh Vohra

Alireza Tahbaz-Salehi
Northwestern Kellogg

Econometric Society Winter Meeting
January 2018
Market Fragmentation

- Many financial markets are not centrally cleared: securities are traded over the counter or on multiple exchanges.

- Not very surprising when assets are customized (e.g., interest rate swaps) or there are high costs associated with trading on an exchange (e.g., higher margin requirements)

- But fragmentation happens even when barriers to entry are small and the “law of one price” is violated (e.g., Chinese A-, B-, and H-shares).

- Some reasons offered for fragmentation:
  - search frictions (Duffie, Garleanu, and Pedersen, 2005)
  - counterparty position limits (Atkeson, Eisfeldt, and Weill, 2015)
  - price impact (Malamud and Rostek, 2017)
This Paper

Main claims:
- “centralized markets are inherently unstable” and lead to fragmentation.
- Offering what the authors see as a “more fundamental” reason for fragmentation that is orthogonal to asset specifics and the institutional details.

Approach:
- A model of endogenous fragmentation: a subset of agents can leave the incumbent exchange and trade in an alternative trading venue.
- Various notions of stability/instability depending on the behavior on the incumbent exchange if the block fails.
Environment

- A single asset.

- \(m\) buyers and \(m\) sellers with private valuations for the asset.

- Each agent can hold either 1 or 0 units of the asset \(\rightarrow\) indivisible asset.

- Utilities:

\[ u_i = q_i(v_i - p_i), \]

where \(|q_i|\) is the probability that trader \(i\) engages in trade.

- A mechanism design approach: each trader reports her valuation to a mechanism that determines the allocations.
D-Blocking

- Incumbent mechanism is assumed to be
  - deterministic
  - ex post budget balanced (EBB)
  - ex post individually rational (EIR)
  - dominant strategy incentive compatible (DSIC)

- Focus on bilateral trade \((m = 1)\)

- Sufficient to focus on posted price mechanisms (Hagerty and Rogerson, 1987): Designer posts \(p_1 \leq p_2\); if parties agree to trade, buyer pays \(p_2\) and seller gets \(p_1\).

- **D-Blocking**: A DSIC and EIR mechanism D-blocks the incumbent if both parties prefer to ditch the incumbent for the alternative.
D-Blocking

Theorem

*Any posted price mechanism with price*

\[ p \in [p_{\text{buyer}}^*, p_{\text{seller}}^*] \]

*is immune to D-blocking, where*

\[ p_{\text{buyer}}^* = \text{price offered by the highest type buyer} \]

\[ p_{\text{seller}}^* = \text{price offered by the lowest type seller} \]

- **Paper's interpretation**: When the type distributions are unknown, there is no mechanism that is robust against D-blocks by positive spread posted price mechanisms.

Theorem

*For any mechanism that is independent of type distributions, there is a distribution over types under which the mechanism can be D-blocked by a group of agents.*
C-Blocking and B-Blocking

- What if we do not impose the assumption that the incumbent mechanism is DSIC (e.g., double auctions)?
- Now the traders’ beliefs about the counterparty’s type become relevant.

- **C-Blocking**: if a block fails, agents keep playing the original equilibrium hypothesized in the incumbent mechanism.

- **B-Blocking**: if a block fails, agents update their beliefs about the types of the counterparties they face.
Theorem

*Buyer's bid and mid-point double auctions have an equilibrium that is immune to C-blocking and an equilibrium that is not.*

- **Paper's interpretation**: “immunity is present only if agents play the "right" Bayesian Equilibrium in the incumbent mechanism.” → pointing towards instability of centralized trade.
Comment 1: Interpretation

- **Result:** A posted price mechanism is immune to D-blocking if \( p \in [p^*_{buyer}, p^*_{seller}] \).

- **Paper’s Interpretation:** “centralized markets are inherently unstable”
  - “Only when a posted price is tailored to the distribution of types […] it is immune to D-blocks.”
  - “When the type distributions are unknown, there is no mechanism that is robust against D-blocks.”

- **Comment:** Isn’t robustness to all type distributions too strong of a requirement?
Comment 1: Interpretation

- Can the same argument not be applied to argue that OTC trading is unstable?
  - **incumbent**: OTC trading mechanism
  - **alternative**: Centralized trade.
  - Reasonable to expect that there is a type distribution under which all agents abandon the OTC market for the centralized mechanism.

- More generally, suppose there are two possible type distributions, where
  \[ \text{Pareto Frontier}(D_1) \cap \text{Pareto Frontier}(D_2) = \emptyset. \]

  Any mechanism can be blocked!

- Are the results about the instability of centralized markets or can be applied to a larger class of mechanisms?
- Would the instability result survive under a less stringent requirement?
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• Are the results about the instability of centralized markets or can be applied to a larger class of mechanisms?

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Comment 2: Interpretation

• **Result:** For any mechanism that is independent of type distributions, *there exists* a distribution over types under which the mechanism can be D-blocked by a group of agents.

• **Comment:** Hard to interpret the above as an instability result without having a sense of whether the set of such distributions is large or small.

• For example, if the set of such distributions is countable, then the above is more like a stability result.

• “Quantifying” the above distributions would clarify the interpretation of the result.
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  For example, if the set of such distributions is countable, then the above is more like a stability result.

- “Quantifying” the above distributions would clarify the interpretation of the result.
Comment 3: Interpretation

- **Result**: Double auctions are immune to C-blocks by a positive spread posted price mechanism. “*However, the immunity is present only if agents play the right Bayesian equilibrium in the incumbent mechanism.*”

- Instability interpretation relies on equilibrium multiplicity.

- But this can be a bit tricky: for example, what if the alternative mechanism is simply overcoming “coordination failures” in the incumbent mechanism?

- Can one establish the instability of centralized markets without relying on equilibrium multiplicity? or alternatively, in an environment in which all equilibria are unstable?
Comment 4: Which Markets and Which Assets?

• Current draft is silent on what kind of real-world markets are more prone to fragmentation.
• This makes it hard to think about the results’ empirical relevance.

• Example:
  - Results are presented for an indivisible asset with unit demand and supply.
  - Reasonable when thinking about buying a house or undertaking an IPO.
  - Maybe not so much for bond markets, FX markets, etc.

• Are these good assumptions? Which markets should one expect the results to apply to? Which notion of blocking is more relevant?
• A discussion of the markets to which the environment and the results are applicable would help evaluate the various assumptions in (and the conclusions of) the model.
Summary

- Very interesting question: endogenous fragmentation of markets.
- Original idea: take a mechanism design approach to study market fragmentation
- Contribution: providing a framework and the solution concepts to study robustness and instability of trading venues.
- The instability interpretation seem to be driven by either
  (i) too stringent requirement for stability
  (ii) equilibrium multiplicity
  It would be nice to show lack of robustness without relying on the above elements.
- A discussion of the markets to which the environment and the results are applicable would help evaluate the various assumptions and objects in the model.