Discussion of:
"Dealer Networks: Market Quality in Over-The-Counter Markets"

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Outline

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The Data & the Questions

Data: the Municipal Securities Rulemaking Board's (MSRB) proprietary Transaction Reporting System (aka the municipal bond market dealer network)

- 1998-2012 (3400 trading days), 60M transactions (16M inter-dealer), 1.4M different bond issues, 2,078 dealer firms (700-800 active per month)

- a great data set!

Network: inter-dealer trading relations.

Question: how does dealer interconnectedness and centrality relate to trading costs, liquidity provision, and price discovery?

Approach: construct a (principal component of) network centrality measure, and and check wether it can help explain: dealer mark-ups, dealer loss probabilities, information price efficiency, order flows, inventories, inter-dealer centrality

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Key Findings, a Big Question, and some Advice

- Trading flows from periphery and centre and back
- Central Dealers (CDs) are less likely to suffer capital loss (maybe that's why they become central?)
- CDs provide more immediacy by having larger inventory risk.
- CDs face larger intermediation cost, but earn larger profits.

But: who, how, and why become a central dealer?

- Location in the network is a decision variable, not a treatment $\rightarrow$ can it be forecasted? what are its determinants?
- A simple possible story:
  lower risk aversion $\rightarrow$ larger inventory (risk)
  $\rightarrow$ $\uparrow$ immediacy/matching prob
  $\rightarrow$ $\uparrow$ centrality, higher markups to compensate immediacy and higher profits
  $\rightarrow$ larger inventory $\rightarrow$ ...
- can make a similar story based on skills.

Advice: use your big T to tackle the centrality determinants.

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Econometric Nitpicking

- the authors don't take a stand on the "relevant" centrality measure, and instead extract the first principal component of a large set of possible centrality metrics: "Net"

Recall: Given a $N \times T$ matrix of (demeaned) data $\mathbf{Z} = [Z_1, ..., Z_T]$, the principal component at time t is defined as $c^\top Z_t$ where

$$c = \arg\max c^\top \mathbf{Z}\mathbf{Z}^\top c \;\text{ s.t. }\; c^\top c = 1$$

$\Rightarrow$ hence $c^\top Z_t$ contains info about the future... hence there is a problem in the panel regression (same as filtered regressors)

Solutions:

1. Take a stand on the centrality measure (use/build economic theory!)
2. or... construct c with a rolling window

Note: in cross-sectional regressions "Net" is endogenous.

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Liquidity Spillovers

- The authors model the inventory/trade/SD(ΔInventory) decision as a (cross-sectional) spatial autoregression

$$y_i = \alpha + \lambda \sum_{j \neq i} w_{ij} y_j + \beta^\top X_i + \varepsilon_i \sim N\left(0, \sigma^2\right)$$

where w_{ij} measure the "links" between i and j – how?

But:

1. w_{ij} is endogenous! ⇒ use, the time dimension and instrument/lag it.
2. $|\lambda^{-1}|$ should be larger than the largest eigenvalue of W for the above to be an equilibrium.
3. A structural liquidity game on a network give rise to Spatial Error, not Spatial Autoregression (and from the former you get a lot of "action" e.g. Denbee, Julliard, Yuan and Li (2013))
4. Moreover, the above is a restrictive case of a Spatial Durbin model – the most general linear spillover framework.

⇒ do formal model selection for SAM, SEM and SDM (using the time dimension too, and allow for σ_i)

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