Discussion of 'Pairwise Trading in the Money Market during the European Sovereign Debt Crisis' by Edoardo Rainone

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Paper overview

- Topic: Analysis of conditions for banks in the money market during the sovereign debt crisis.
- Background: Aggregate evidence for substantial increase in rate dispersion since the start of the crisis.
  $\Rightarrow$ Undesirable from regulatory point of view, points to non-smooth monetary policy transmission.
  $\Rightarrow$ May be due to increased monitoring, as well as relationship lending.

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  $\Rightarrow$ May be due to increased monitoring, as well as relationship lending.
- Idea: Use granular (TARGET2) data on unsecured interbank lending to study "who trades with whom, how much, and at what price".
- Methodology: Econometric model for dyadic data, controlling for selection bias.

Potential selection bias (1/2)

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In this case,

$$\mathrm{E}[p_i|X_i, i \text{ is observed}] = X_i'\beta + \underbrace{\mathrm{E}[\epsilon_i|X_i, i \text{ is observed}]}_{\neq 0} \tag{2}$$

and β cannot be estimated consistently by OLS.

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- Here: Probit models for both lender and borrower:

$$Pr(s^*_{i,l} \geq 0) = \Phi(Z'_{i,l}\gamma_l + v_{i,l}) \quad (3)$$

$$Pr(s^*_{i,b} \geq 0) = \Phi(Z'_{i,b}\gamma_b + v_{i,b}) \quad (4)$$

where $s^*_{i,j}$, $j \in l, b$ is the expected payoff from trade i.
$\Rightarrow$ Trade i is only observed if $I(s^*_{i,l} \geq 0) \cdot I(s^*_{i,b} \geq 0) = 1$.

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- Including estimates of so-called inverse Mills ratios $\lambda_{i,j} = \frac{-\phi\left(\frac{Z'_i\gamma_j}{\sigma_{v,j}}\right)}{\Phi\left(\frac{Z'_i\gamma_j}{\sigma_{v,j}}\right)}$,

  $j \in l, b$, as regressors in (1) gives unbiased estimates of β.

Empirical findings

Who trades with whom?

- Bigger banks are more likely to lend; core-periphery structure of interbank network.
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At what prices?

- Borrowers' nationalities matter a lot.
- Big banks charge higher rates as lenders and pay lower rates as borrowers.

Comment 1: Specification of outcome equations

For an observed trade at time t, the exchanged rate and quantity are modeled as

$$q_{lb,t} = g(B_{l,t}, C_{l,t}, B_{b,t}, C_{b,t}, k_{b,t-1}, k_{l,t-1}, g_{lb,t-1}) \quad (5)$$

$$p_{lb,t} = f(B_{l,t}, C_{l,t}, B_{b,t}, C_{b,t}, q_{lb,t}) \quad (6)$$

where $B_{l,t}$, $B_{b,t}$, $C_{l,t}$, $C_{b,t}$ denote lender and borrower characteristics, $k_{b,t-1}$, $k_{l,t-1}$ capture past lending and borrowing activities, and $g_{lb,t-1}$ equals one if l and b have traded in $t-1$.

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- Parameterization (equation (12) in the paper) in terms of parameters of the selection equation. Structural or reduced form model? Identification?
- Quantity exogenous to rate, but not vice versa?

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- Time-series properties/persistence of estimated parameters? Periods of parameter stability?
- Possibly: Time-varying parameter model, for example

$$p_{lb,t} = X_{lb,t}\beta_t + \epsilon_{lb,t}, \quad \epsilon_{lb,t} \sim N(0, \sigma_\epsilon^2) \tag{7}$$

$$\beta_{t+1} = A\beta_t + \eta_t, \quad \eta_t \sim N(0, \Sigma_\eta) \tag{8}$$

where $X_{lb,t} = (1, x_{lb,t}, q_{lb,t}, \lambda_{l,t}, \lambda_{b,t})'$ $\beta_t = (\beta_{0,t}, \beta_{1,t}, \alpha_t)'$, A is a matrix of unknown coefficients, σ_ϵ^2 is an unknown variance, and Σ_η is an unknown covariance matrix.
$\Rightarrow$ extract β_t via Kalman filter and estimate unknown parameters using maximum likelihood.

Other questions/comments

- Tables 2 - 5: Omit results from simple linear regression estimation?
- Quantity equation - Lender country effects (Figure 13): Everybody lends less than German banks?
- Include central bank as lender of last resort into the model?
- Policy implications? Possible to extract a measure of systemic risk/monetary policy transmission "malfunction"?

Conclusion

- Very interesting paper!
- In-depth empirical study of interbank trade data, explicitly controlling for selection bias.
- Zooming into the interbank market and using a model for granular trade data helps to explain increased dispersion of rates during the sovereign debt crisis.
- Relationships between structural and reduced form model parameters can be clarified.
- Methodology could be extended to exploit the panel structure of the data.

Thank you.