Discussion of "Systemic Risk-Shifting in Financial Networks" by Elliott, Georg, and Hazell

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Federal Reserve Board Conference
on the Interconnectedness of Financial Systems
March 2019

This Paper

- An interesting empirical finding:
  - German commercial banks
  - banks with more similar real exposures are more likely to have financial connections

- A model of endogenous network formation with endogenous portfolio choice
  - can result in patterns consistent with the finding
  - inefficiency in the distribution of linkages
  - inefficiently high levels of systemic risk

Model

- n banks with outside debt obligations with face value $\underline{v}$
- outside assets with potentially correlated returns p_i.

- To diversify risk, banks can enter into risk-sharing agreements.
- There is a cashflow reduction if the bank cannot meet its obligations.

$$v_i = \sum_{j=1}^{n} A_{ij} \left(p_j - \beta \mathbf{1}_{v_j \neq \underline{v}} \right)$$

- Equity value and debt repayment:

$$\begin{aligned} \pi_i &= \max\{v_i - \underline{v}, 0\} \\ \delta_i &= \min\{v_i, \underline{v}\} \\ v_i &= \pi_i + \delta_i. \end{aligned}$$

Network Formation and Portfolio Choice

- Each bank can be hit by two types of shocks:
  - small shocks: large enough to wipe out an individual bank
  - large shocks: large enough to wipe out the entire system

- Banks can choose their exposure to each other (matrix **A**).
- While they cannot make their private project less risky, they can invest in projects that fail in different states of the world.
  - control over the joint distribution, subject to preserving the marginals

Key Tradeoff

- Greater financial interconnectivity can prevent costly failures by diversifying bank-level risks.
  - particularly important when negative shocks to cashflows tend to be small
- But at the same time, greater interconnectivity can also results in further propagation of the shocks.
  - important in the presence of large shocks.
- The tradeoff is present both in equilibrium and social planner's problem.
  - Question: is there a wedge between the two solutions?

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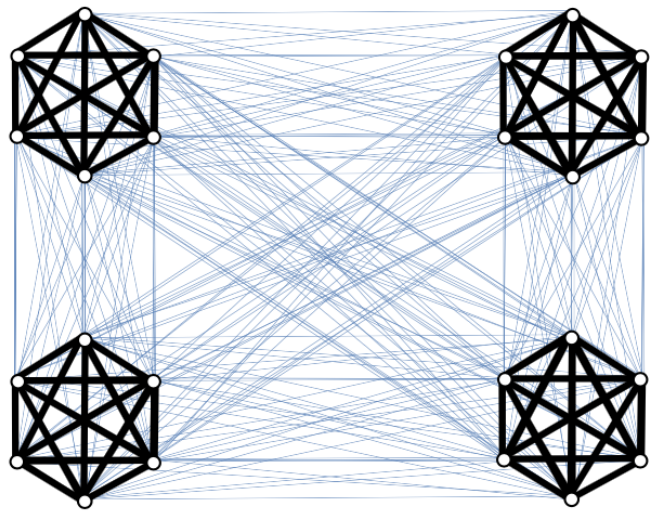
First Result: Efficiency Benchmark

- Social planner maximizes welfare (minimizes total deadweight losses):
- Optimal network structure is collection of clusters with firebreaks:



- Optimal investment decisions entail separate shocks, where no two banks fail simultaneously.

Efficiency Benchmark: Intuition

- Separability of shocks ensures that the aggregate distress in the economy is minimal at any given state of the world.

- The clustering & firebreak architecture provides maximal insurance against small shocks, while minimizing the number of banks that are exposed to the propagation of large shocks (due to the firebreaks).

- These features ensure that the expected number of defaults in the economy is minimized.

Second Result: Equilibrium

- The socially efficient architectures (network + shock distribution) are unstable under limited liability.

- Banks' private incentives are misaligned with those of the planner: they find it profitable to correlate their returns with those of their counterparties.
  - each bank maximizes its returns conditional on not failing.
  - this means it prefers if its counterparties fail at the same state of the world as itself.

Summary

- (My) main takeaways:
  - With endogenous network linkages and correlation structures, there is a wedge between the equilibrium and the solution to the social planner's problem.

- Implications:
  - individual risk-shifting can result in endogenous systemic risk
  - the level of systemic risk can be inefficiently high

- Choice of efficiency benchmark is crucial.

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- Choice of efficiency benchmark is crucial.

Comment: Efficiency Benchmark

- The social planner chooses the correlation structure and network linkages under two constraints:
  - (1) same information set as the banks
  - (2) participation constraints

$$\max_{\mathbf{A}\in\mathcal{A},\,\psi\in\Psi} \quad \sum_{i=1}^{n}\mathbb{E}\left[v_i(\mathbf{A})\right] = \sum_{i=1}^{n}\mathbb{E}\Big[\pi_i(\mathbf{A})+\delta_i(\mathbf{A})\Big]$$

$$\text{s.t.} \quad v_i(\mathbf{A}) \geq v_i(\text{autarky})$$

- Not clear what the role of the participation constraint is.
- What kind of efficiency benchmark should one be thinking about?

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- If the planner is only meant to determine the externalities, why do we need this constraint? Would it not make sense to compare the equilibrium to an efficiency benchmark without constraints?

- Alternative interpretation: the planner is is meant to capture a regulator with limited instruments. She can offer any contracts to the banks, but cannot force them to accept.
- But if that is the case, then why is the participation constraint

$$v_i(\mathbf{A}) \geq v_i(\text{autarky}) \qquad \text{(market value)}$$

  and not

$$\pi_i(\mathbf{A}) \geq \pi_i(\text{autarky})? \qquad \text{(equity value)}$$

- In the current formulation, it is as if the bank and its debt-holders get together to accept or reject the regulator's offer.
- Again, this may make sense, but what is the proper efficiency benchmark?

Minor Comment: Efficiency Benchmark

- The paper assumes that the contracts between debt-holders and the banks cannot be contingent on banks' investment and interbank lending decisions.
  - the key friction in the model and the source of inefficiency

- While endogenous, the paper treats it as exogenous, which is fine given that the contract is pre-determined by the time of banks' decisions.
  - except that it is not policy-invariant $\longrightarrow$ it matters for the wedge between the planner and the decentralized solutions.

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Comment: Interactions Between Various Channels

- Paper shows equilibrium is inefficient when both $\mathbf{A}$ and ψ are endogenous.
- But how about when only one of them is endogenous and the other is not?
- The main results are driven by the interactions between the two channels only if the equilibrium is efficient in the absence of one of the channels.
- Not sure if that is the case:
  - Take an world with exogenous network structure, but endogenous ψ.
  - Wouldn't the banks want to fail at the same states as their counterparties?
  - Similarly for the case with exogenous ψ and endogenous $\mathbf{A}$.

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Empirical Exercise

- Paper documents that German banks tend to lend systemically more to banks with similar exposures.
- Goes against the general risk diversification argument, but is consistent with the model's prediction regarding risk shifting.

- Missing links:
  (1) clear identification of the empirical finding
  (2) alternative explanations?
  (3) direct or indirect evidence for the underlying mechanism

Comment: Evidence for the Mechanism

- The structural model has direct implications for the relationship between "homophily" in interbank lending and the face value of debt to non-bank entities:
  - (in the model), the only reason banks lend more to similar banks is because of risk-shifting incentives.

- Can this be tested in the data?

$$\log(\text{Amount}_{ij}) = \alpha + \beta * \textit{similarity}_{ij} + \gamma * \underline{v}_j + \delta * \textit{similarity}_{ij} \times \underline{v}_j$$

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Summary and Wishlist

- Interesting and novel finding on interbank lending and similarity of exposures
- A concise model of network formation with endogenous portfolio choice.

- Main implications:
  - inefficiently high levels of systemic risk due to risk-shifting
  - homophily in interbank lending, consistent with the empirical findings

- Would be nice to ...
  - clarify the proper efficiency benchmark
  - clarify what results are driven by the interaction between the two channels, and which results are not
  - present (direct or indirect) evidence for the underlying mechanism