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 $v$
- 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.

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

- Equity value and debt repayment:

$$\pi_i = \max\{v_i - v, 0\}$$
$$\delta_i = \min\{v_i, v\}$$
$$v_i = \pi_i + \delta_i.$$
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.
• The social planner chooses the correlation structure and network linkages under two constraints:
  
  (1) same information set as the banks
  (2) participation constraints

\[
\max_{A \in \mathcal{A}, \psi \in \Psi} \sum_{i=1}^{n} \mathbb{E}[v_i(A)] = \sum_{i=1}^{n} \mathbb{E}[\tau_i(A) + \delta_i(A)] \\
\text{s.t.} \quad v_i(A) \geq v_i(\text{autarky})
\]

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• What kind of efficiency benchmark should one be thinking about?
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• Not clear what the role of the participation constraint is.
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Comment: Efficiency Benchmark

- 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 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

  \[ v_i(A) \geq v_i(\text{autarky}) \]  

  (market value)

  and not

  \[ \pi_i(A) \geq \pi_i(\text{autarky})? \]  

  (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, 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 $A$ and $\psi$ 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 $\psi$.
  - Wouldn’t the banks want to fail at the same states as their counterparties?
  - Similarly for the case with exogenous $\psi$ and endogenous $A$. 
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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 \times \text{similarity}_{ij} + \gamma \times v_j + \delta \times \text{similarity}_{ij} \times 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