Clearing, Counterparty Risk and Aggregate Risk

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Motivation

- Counterparty risk as an important concern

  - Lehman, AIG

- Centralized Clearing Platforms (CCP) to mitigate this risk

  - feature prominently in post-crisis regulation design

- Issues…

  - how exactly does clearing improve the allocation of risk?

  - decentralized or centralized (CCP)?

  - is full insurance desirable?

  - can clearing create new risk?

  - how should CCPs be financed, governed, or regulated?

What do we do

- Study optimal clearing arrangements when:

  - risk-sharing contracts between protection buyers and protection sellers are subject to counterparty risk

  - finding creditworthy counterparties requires costly effort (due dilligence)

  - third party can insure against risk of counterparty default (centralized or decentralized)

What do we find

- **Without asymmetric information and aggregate risk**

  - clearing via CCP achieves first-best (through mutualization)

- **Aggregate risk requires finding viable counterparties to bring in risk-bearing capacity**

  - protection sellers provide full insurance against the hedged risk

  - CCP provides full insurance against counterparty risk

- **Unobservable search effort**

  - CCP provides only partial insurance against counterparty risk to encourage finding viable counterparties (constrained efficiency)

Literature

- CCP to prevent non-exclusive contracting

  - Acharya & Bisin (2010)

- Netting efficiency of CCPs

  - Dufffie & Zhou (2009)

- CCPs and asymmetric information

  - Pirrong (2009)

- Endogenous counterparty risk (seller moral-hazard)

  - Thompson (2010); Biais, Heider & Hoerova (2010)

- Asymmetric information about counterparty risk leads to illiquidity in markets

 - Heider, Hoerova & Holthausen (2010)

Protection buyers

- Risk averse protection buyer *j* endowed with illiquid risky asset
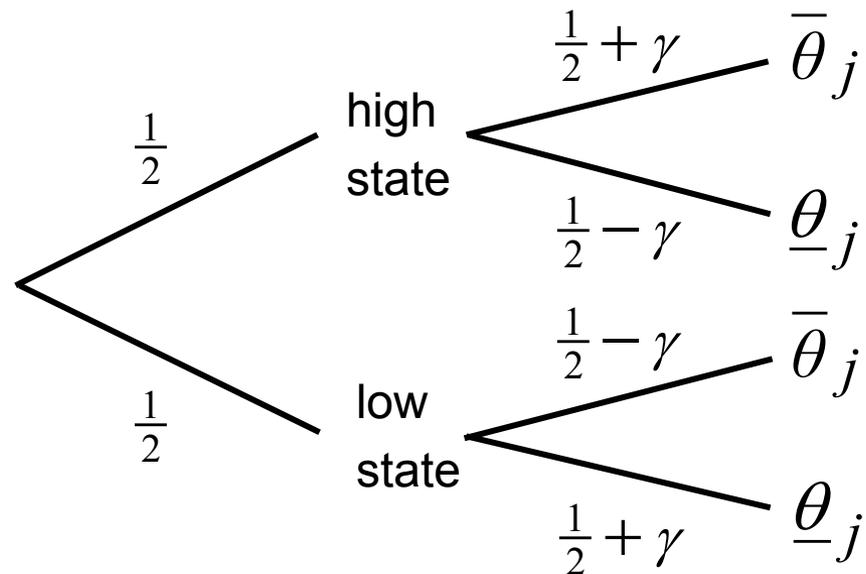
- $\gamma=0 \rightarrow$ only idiosyncratic risk; $\gamma=$ ½ $\rightarrow$ only aggregate risk
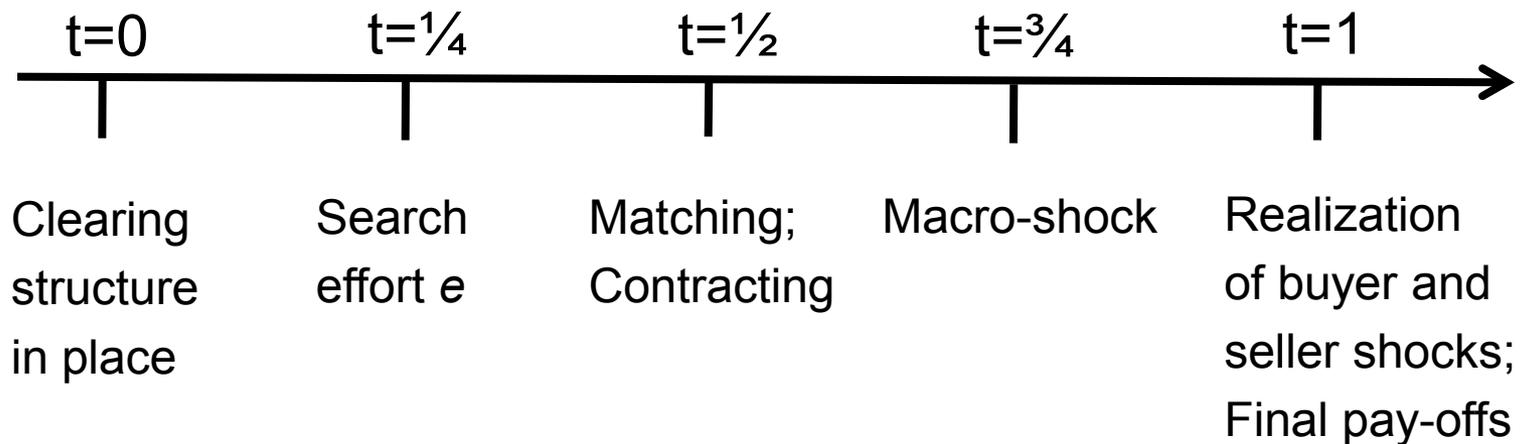
Finding good protection sellers

- Protection sellers are risk-neutral and endowed with risky illiquid asset

  - independent of buyer risk, limited liability

- Finding good protection sellers requires costly effort from buyer (possibly unobservable)
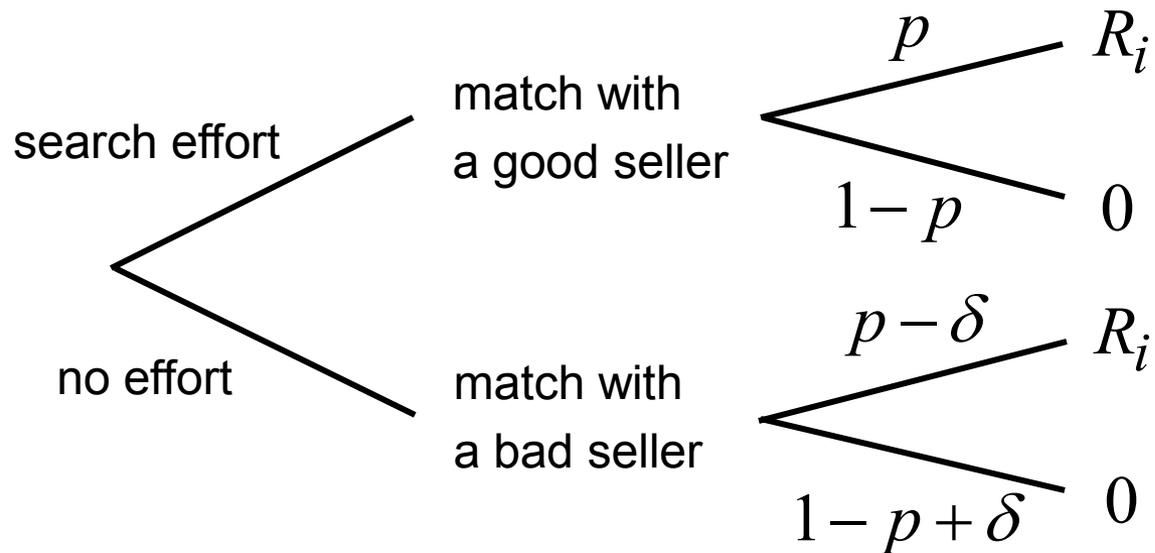
Optimal contracting and clearing arrangements
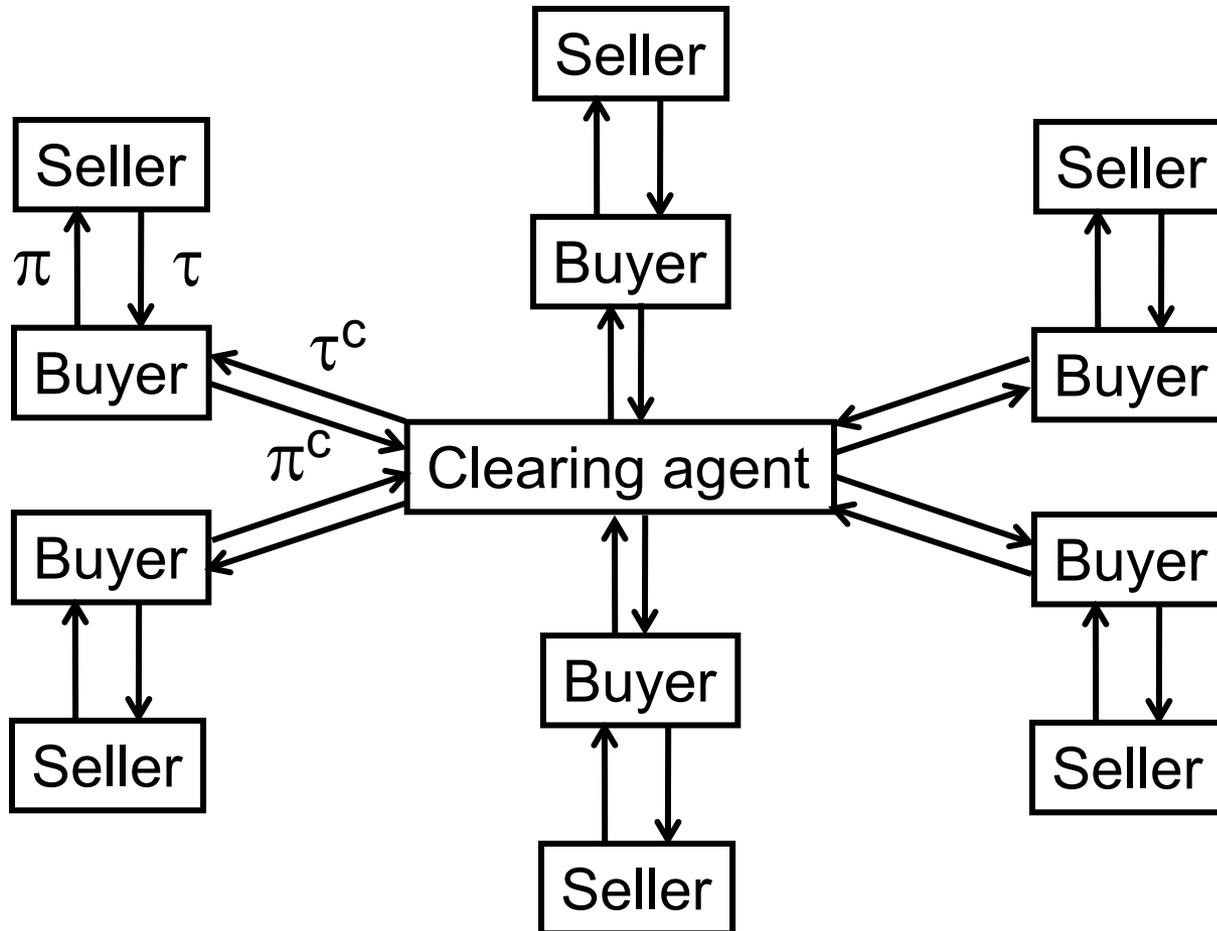
Timeline

No-clearing and decentralized clearing

- Bi-lateral trade
  - full insurance conditional on seller survival
  - exposure to counterparty risk
  - search effort desirable if high risk aversion, large difference across seller types, low cost of effort

- Decentralized clearing
  - opportunity cost of setting aside cash to pay insurance $\rightarrow$ partial insurance against counterparty risk
  - the fee for clearing is higher if search effort not expended

Centralized clearing

- Centralized clearing (mutualization)
  - law of large numbers $\rightarrow$ no opportunity cost
  - full insurance against counterparty risk
  - search effort redundant
- Aggregate risk
  - mutualization is not sufficient
  - effort to ensure additional risk-bearing capacity necessary
  - together, CCP and protection sellers achieve full insurance
- Moral-hazard
  - full counterparty risk insurance undermines incentives to find good counterparties $\rightarrow$ higher aggregate default rates
  - to incentivize search effort $\rightarrow$ only partial insurance

Governance of CCPs

- **Consider a for-profit CCP**
  - could offer full insurance
  - buyers do not exert search effort
  - in good state, CCP collects large fees
  - in bad state, CCP defaults (limited liability)
  - systemic event $\rightarrow$ bail-out
  - confirms expectation of full insurance

- **CCPs are natural monopolies**
  - exclusivity needed to maintain constrained efficiency

- **CCP should be a cooperative or tightly regulated**

Conclusion

- Counterparty risk is an important concern

- It can be mitigated by

  - self-insurance (setting aside safe assets)
  - self-protection (search for good counterparties)
  - mutualization (CCP)

- Appropriately designed CCP implements constrained efficient outcome, but

  - self-protection required to enhance risk-bearing capacity in the presence of aggregate shocks
  - hence, CCP should not offer full insurance