Central Counterparties

Thorsten Koeppl Cyril Monnet

Department of Economics
Queen's University

DG Research
ECB

April 3rd, 2006

Disclaimer: The views expressed are those of the authors and do not necessarily reflect the views of the European Central Bank or the Eurosystem.

Questions

1. Why do CCPs exists?

2. Why is their governance structure important?

3. When do certain governance structure arise?

Questions

1. Why do CCPs exists?
   - collateral facility
   - novation and redistribution of default risk (Bernanke (1990) and Ripatti (2001))

2. Why is their governance structure important?

3. When do certain governance structure arise?

Questions

1. Why do CCPs exists?
   - collateral facility
   - novation and redistribution of default risk (Bernanke (1990) and Ripatti (2001))

2. Why is their governance structure important?
   - heterogeneity of users leads to conflict of interest
   - governance structure allocates control rights

3. When do certain governance structure arise?

Questions

1. Why do CCPs exists?
   - collateral facility
   - novation and redistribution of default risk (Bernanke (1990) and Ripatti (2001))

2. Why is their governance structure important?
   - heterogeneity of users leads to conflict of interest
   - governance structure allocates control rights

3. When do certain governance structure arise?
   - degree of heterogeneity (trading benefits vs. default costs)
   - risk of the instrument traded or general market risk
   - competition

Model

- t=0: People are identical
  - random trading needs
  - limited amount of cash
- t=1: People can be in three situations
  - no trading needs (prob. $1-\pi$)
  - risk-averse and risky security (prob. $\frac{\pi}{2}$)
  - risk-neutral and riskless future endowment (prob. $\frac{\pi}{2}$)
- t=2: Security's pay-off realized
- Limited commitment
  - strategic default
  - people need incentives to honour their promises

No trade

Model captures rationale for futures trading

- sellers want to hedge against risk in the future
- buyers want to take on this risk

No trade

Model captures rationale for futures trading

- sellers want to hedge against risk in the future
- buyers want to take on this risk

1. Trading is time-critical
   - trade has to occur before t=2

No trade

Model captures rationale for futures trading

- sellers want to hedge against risk in the future
- buyers want to take on this risk

1. Trading is time-critical
   - trade has to occur before t=2
2. Limited liquidity
   - not enough cash for spot trade

No trade

Model captures rationale for futures trading

- sellers want to hedge against risk in the future
- buyers want to take on this risk

1. Trading is time-critical
   - trade has to occur before t=2
2. Limited liquidity
   - not enough cash for spot trade
3. Limited Commitment
   - futures contract at t=1 with settlement at t=2 impossible

No trade

Model captures rationale for futures trading

- sellers want to hedge against risk in the future
- buyers want to take on this risk

1. Trading is time-critical
   - trade has to occur before t=2
2. Limited liquidity
   - not enough cash for spot trade
3. Limited Commitment
   - futures contract at t=1 with settlement at t=2 impossible

Result: No trading is possible.

CCP enables trade

Collateral facility

- default fund f at $t = 0$
- margin call m at $t = 1$
- cost: α per cent of collateral posted

CCP

- covers default by requiring collateral (novation)
- can redistribute default costs among people (anonymity)

CCP enables trade

Collateral facility

- default fund f at $t = 0$
- margin call m at $t = 1$
- cost: α per cent of collateral posted

CCP

- covers default by requiring collateral (novation)
- can redistribute default costs among people (anonymity)

Result: Trade at $t = 1$ is then possible

- futures contract at $t = 1$
- net settlement in cash at $t = 2$
- incentives to honour the contract

User- vs. Profit-oriented CCPs

Allocation of control rights matters (Hart and Moore (1990, 1995)

- commitment problems for institutions
- governance structure fills in contractual "voids"

User-oriented CCP

- maximizes utility of the majority of users (median user)

Profit-oriented CCP

- maximizes revenue/profit (marginal user)

We abstract from default of the CCP.

No unsecured default risk

When collateral is enough to secure *all* default exposure...

User-oriented CCP

- minimizes collateral costs for users
- uses default fund only when margin calls too costly to support trade

Profit-oriented CCP

- maximizes profits from collateral posted
- prefers the default fund to extract more rents

No unsecured default risk

When collateral is enough to secure *all* default exposure...

User-oriented CCP

- minimizes collateral costs for users
- uses default fund only when margin calls too costly to support trade

Profit-oriented CCP

- maximizes profits from collateral posted
- prefers the default fund to extract more rents

Result: There are two inefficiencies from profit-orientation.

1. Overcollateralization
2. Higher default fund contributions

Unsecured default risk

When collateral is *not enough* to cover all exposure if default risk increases...

$\Rightarrow$ CCP has to redistribute residual cost from default among non-defaulting users

$\Rightarrow$ Heterogeneity leads to conflict of interest

- some users have small gains from trade, but bear residual costs of default
- other users have large gains from trading, but increase default risk

Optimality of For-Profit

User-oriented CCP shuts down trading when risk increases.

- majority of users prefers no trade (hold-up problem)
- avoids default, but no gains from trading

Profit-oriented CCP still enables trade.

- does not bear default costs
- considers the marginal user that gains from trade

Optimality of For-Profit

User-oriented CCP shuts down trading when risk increases.

- majority of users prefers no trade (hold-up problem)
- avoids default, but no gains from trading

Profit-oriented CCP still enables trade.

- does not bear default costs
- considers the marginal user that gains from trade

Result: Profit-orientation if

Expected net benefits from trading when risk increases

$>$

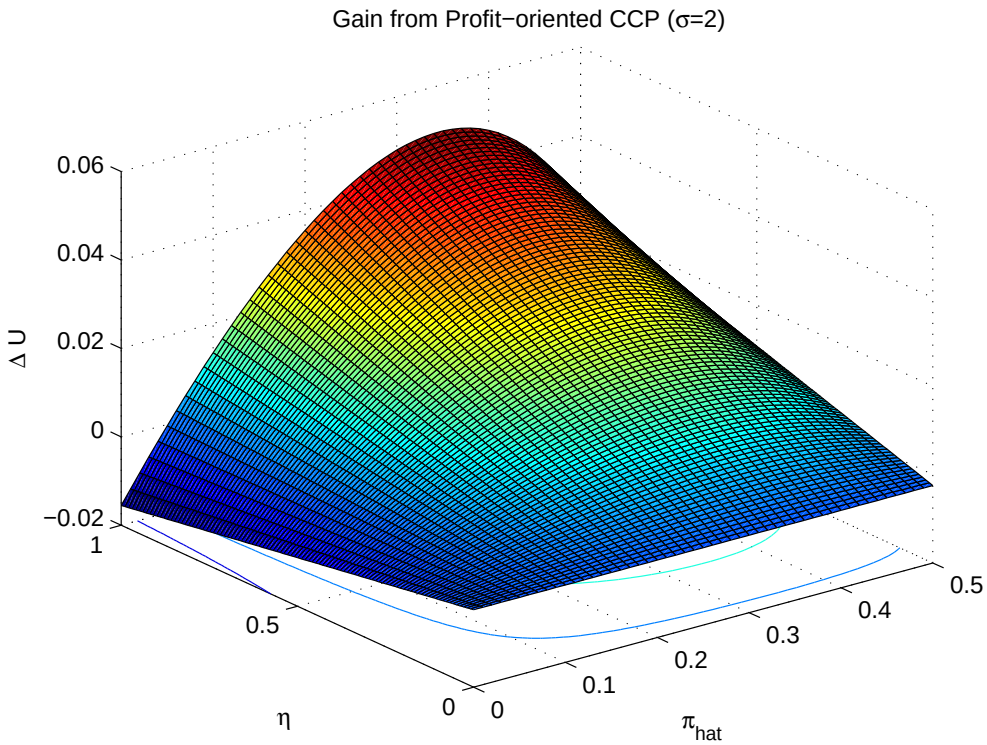
Costs of inefficient collateral policy + Expected hold-up costs

Example

η - likelihood of risk increase

π_{hat} - degree of heterogeneity

ΔU - net gain from profit-orientation

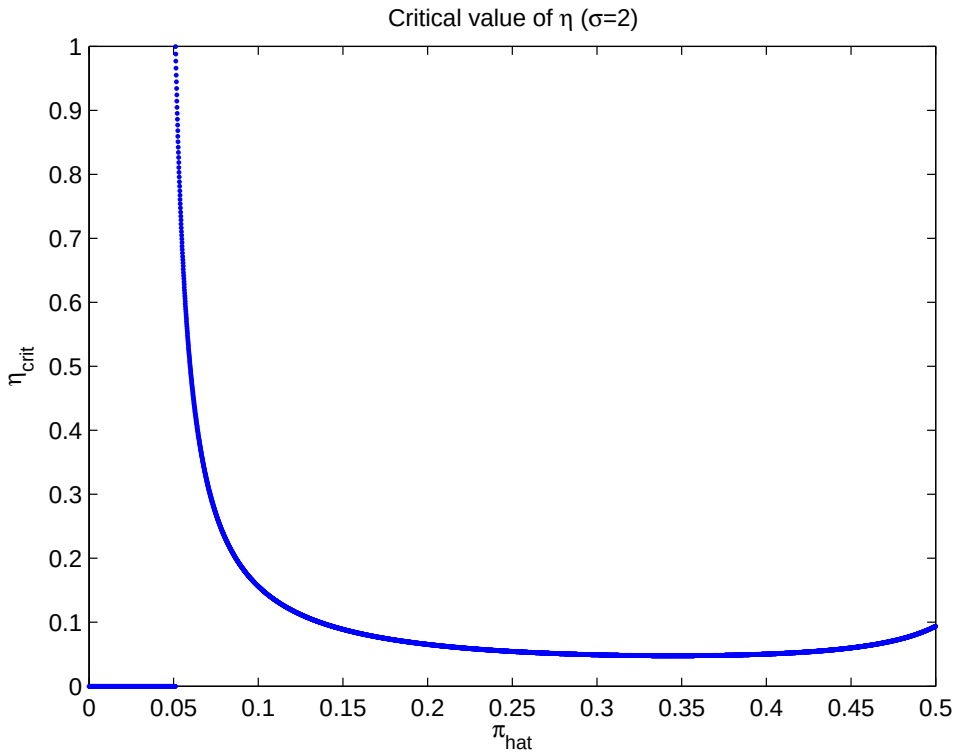


Example

η - likelihood of risk increase

π_{hat} - degree of heterogeneity

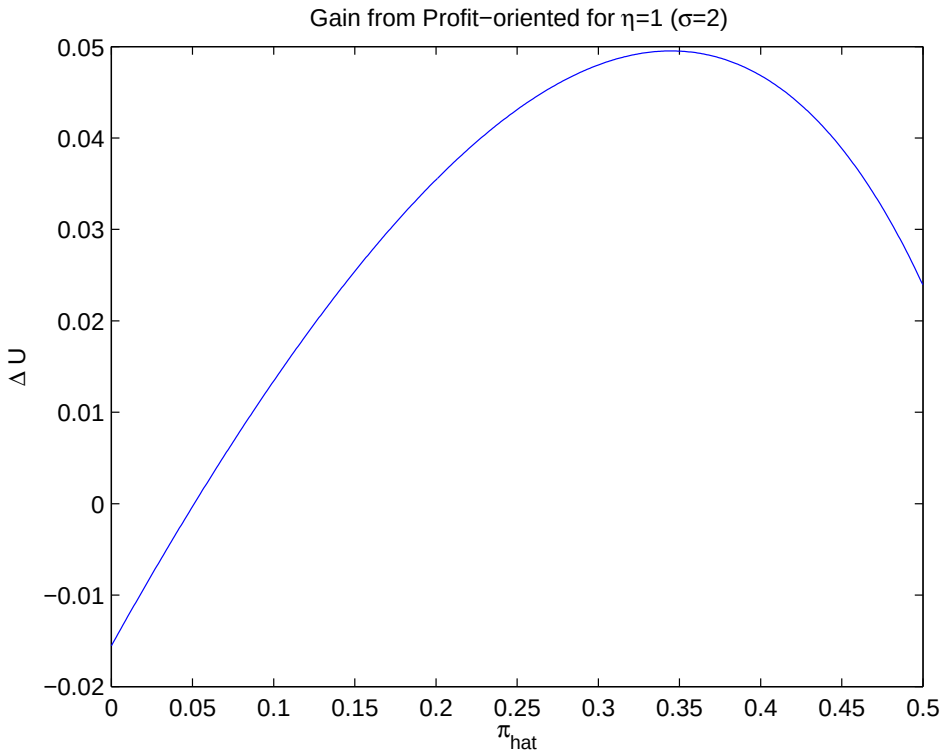
ΔU - net gain from profit-orientation



Example

η - likelihood of risk increase

π_{hat} - degree of heterogeneity



Summary

CCPs enable trade:

- collateral facility
- redistribution of default risk

Governance structures matter:

- heterogeneity and redistribution of default costs
- conflict of interest (volume of trade vs. associated default risk)

Implications

1. For-profit CCPs rely relatively more on default funds than on margin calls.
2. For-profit CCPs operate in more competitive markets.
3. Markets with large heterogeneity and high risk favour profit-orientation. (e.g. OTC, see Kroszner (1995))
4. Controling for these characteristics: no difference in volume of trade and default.