Lecture 12. The Endogenous Emergence of Trading Institutions (Kirchsteiger et al. 2005)

1. Introduction

Lecture 11: deliberate introduction of new trading platforms plus selection between them

now: emergence of new trading platforms as unintended consequence of traders' behavior.

Key features of market institutions?

DA: (Smith 1962, JPE): every trader informed about every offer and every acceptance; quick convergence to market clearing, high efficiency

DBM (Chamberlain 1948, JPE): every offer applies to one potential client, no other trader informed; slow convergence, low efficiency.

$\implies$ Key features: matching and information structure

Which information and matching structures evolve endogenously?

What are the properties of endogenously emerging institutions w.r.t. prices and efficiency?

Can introduction of designed institutions improve performance of markets, or are undesigned institutions already "optimal"?

2. Experimental Design

6 buyers and 6 sellers

at most one unit traded per trader

each buyer n faces exogenously given resale value r_n, each seller m exogenously given production costs c_m

Repetions of the market

Role of each subject remains the same

Set of resale values and production costs to be found on market stays the same (i.e. demand and supply functions do not change)

individual r_n and c_m changes from period to period.

Earnings from trade at price p

$$\pi_n = r_n - p$$
$$\pi_m = p - c_m$$

Traders have *ID* letters (*A-F* for buyer, *U-Z* for seller)

ID letters unrelated to resale values, production costs, and real identities

Traders make offers to buy/sell consisting of

Price offer

IDs of potential clients to whom offer applies

IDs of competitors who are also informed about the offer

any applying offer from the other market side can be accepted (unless one has already accepted another offer)

Those informed about an offer are informed about acceptance (price, not *IDs*)

For each offer, its dissemination measure by

$$D_{client} = \#\text{traders other side to whom offer applies}/6$$
$$D_{comp} = \#\text{traders own side who are informed}/5$$

Two special cases

For all offers, $D_{client} = 1$, $D_{comp} = 1 \implies$ DA

For all offers, $D_{client} = \frac{1}{6}$, $D_{comp} = 0 \implies$ DBM

Also other institutions as special cases

2 Control treatments: exogenously given DA and DBM

Computerized trading

18 rounds

4 sessions for each treatment

3. Frictionless Markets

Which institution emerges endogenously?

$D_{client} = 1$: offers applied to all potential clients

$D_{comp} = 0$: offers are hidden from competitors

$\implies$ Double Sided Private Exchange (DSPE)

To analyze properties of DSPE

Price convergence measured by sum of absolute value of difference between realized price and equilibrium price interval

Efficiency measured in realized gains of trade

Results

Prices converge in DSPE as quickly as in DA

Efficiency (DSPE)=Efficiency (DA)>Efficiency (DBM)

$\implies$ Efficient institution emerges, despite traders' preference for private exchange

Open questions

Do we still get an efficient institution when there are small frictions (transaction costs)?

Can small exogenous transaction costs shape the emergence of trading institutions?

$\implies$ One-sided transaction costs

Strong preferences for privacy?

Reasons for privacy?

$\implies$ Asymmetric transaction costs (incentives for price communication)

4. Market with One-sided Transaction Costs

Transaction costs

Sellers: zero

Buyers: 0.25 points per informed co-trader

Do transaction costs shape the emergence of the institution?

TC significantly decreases the average number of bids per buyer per round
$(2.6 \rightarrow 1.4)$ as well as D_{client} $(0.86 \rightarrow 0.38)$ and D_{comp} $(0.12 \rightarrow 0.02)$.

The average number of asks per seller per round increases slightly
$(2.7 \rightarrow 3)$

There is not significant difference in D_{client} $(0.87 \rightarrow 0.85)$ and D_{comp}
$(0.13 \rightarrow 0.09)$ of asks.

$\implies$ 'One-sided Private Exchange' (OSPE)

Properties of OSPE

Sellers receive very little information about offers and realized trades
($54.3\% \rightarrow 25.7\%$).

Prices converge in OSPE slower as in DA or DSPE.

The emerging OSPE is inefficient: foregone surplus is higher than in DA or
DSPE ($0.95\% \rightarrow 2.84\%$).

$\implies$ No "guarantee" for the emergence of efficient institutions.

5. Market with Asymmetric Transaction Costs

"Transaction costs"

Buyers: 0.25 points per informed co-trader

Sellers: 0.1 points per informed buyer
    bonus of 0.02 points per informed competitor

Results

Sellers are "active", buyers "inactive" (like one-sided costs treatment)

Even with monetary incentives traders are reluctant to inform competitors (59, 6% of asks: $D_{comp} = 0$)

$\implies$ Strong preference for (inefficiency generating) privacy

Small, but positive correlation between average D_{comp} of asks and average price

Accepted asks with $D_{comp} > 0$ are smaller than accepted asks with $D_{comp} = 0$

$\implies$ Price communication between competitors is a public good.

6. Conclusions

Transaction costs have a strong and predictable effect on market structure.

Emergence of an efficient market institution is not guaranteed - even very small transaction costs may generate inefficiencies.

Strong preference for (inefficiency generating) privacy.

$\implies$ Regulation can be efficiency improving