Information Concentration in Common Value Environments

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Motivation

Industry Motivation

- Mergers in auction markets
- Joint exploration of oil fields
- Syndicated bids in IPOs

Theoretical Conjectures

- Joint bidding reduces the winner's curse
- Leads to more aggressive bidding and higher revenues

  Krishna & Morgan 1997, Pinske & Tan 2005

Antitrust Concerns

- A hands-off approach to common value auctions

Conjectures

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Joint bidding leads to higher industry concentration
and higher information concentration

Concentration

Better information in allocation problems

- Matthews 1984, Persico 2000, Athey & Levin 2001, Bergemann and Valimaki 2002, Mares and Harstad 2003

Greater industry concentration and mechanism response

- Bulow & Klemperer 1996

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We keep the total amount of information constant while concentrating its allocation among fewer bidders

Theoretical Challenges

- Multidimensional Signals
  - call into question existence of equilibria in auctions (Jackson 2005) and incentive compatible mechanisms (Armstrong & Rochet 1999)
  - overcome by imposing symmetry and specific value functions (Goeree & Offerman 2002, DeBrock & Smith 1983, Krishna & Morgan 1997, Mares & Shor 2008)
- Asymmetry
  - Common auction formats are not optimal
  - Creates fairly complicated information “spillovers"
  - Requires a mechanism design approach

Outline

1. Model
2. Results
   - Previous Results
   - Scalar Mechanisms
   - Revenue
3. Conclusion

Model

- A seller of an indivisible item faces m risk-neutral buyers
- Bidders posses $n \geq m$ signals. Signal X_i has distribution F_i
- The vector of signal realizations is denoted by **s**
- A buyer's value function is given by $V_i(\mathbf{s})$
- An information profile $A = (A_1, \ldots, A_m)$ is a partition of n

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Standard Symmetric Auction Model

$m = n \qquad A_i = \{i\} \qquad F_i \equiv F \qquad V_i(\cdot) \equiv V(\cdot)$

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- The seller determines a mechanism, $\eta = (p_i(\hat{\mathbf{s}}), \xi_i(\hat{\mathbf{s}}))$

$$\begin{aligned} \hat{\mathbf{s}} &: \quad \text{buyers' reports} \\ p_i &: \quad \text{allocation probability} \\ \xi_i &: \quad \text{payment} \end{aligned}$$

Research Question

What is the impact of coarser information partitions on a seller's revenue ?

- For example:

$$A = \{ A_1 , A_2, A_3, \dots, A_n \}$$
$$A' = \{ A_1 \cup A_2, A_3, \dots, A_n \}$$

- Is the seller better off under A' than under A?

Previous Results

In private value auctions

- Symmetry-inducing mergers may be pro-competitive
  Thomas 2004, Dagen and Richards 2006, Cantillon 2008
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In common value auctions

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  increased industry concentration reduces revenue
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Value function-specific symmetric models

- Commonality among employed models:
  Existence of a scalar sufficient statistic

Scalar Mechanisms

- Assume that buyer 1's information can be summarized by a scalar sufficient statistic $\phi_1(\mathbf{s}_1)$

$$\phi_1(\mathbf{s}_1) \geq \phi_1(\mathbf{s}_1') \Leftrightarrow V_j(\mathbf{s}_1, \mathbf{s}_{-1}) \geq V_j(\mathbf{s}_1', \mathbf{s}_{-1})$$

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- For each mechanism η, construct a scalar mechanism η'
  • depends only on a scalar signal from buyer 1
  • averages allocation probabilities and payment functions across equivalent types

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- Therefore:
  The seller can maximize revenue using only scalar mechanisms

Revenue Effect

- Consider a pure common value auction, $V_i(\cdot) \equiv V(\cdot)$
- V admits sufficient statistic representations for all players and information profiles
- $\partial_i V > 0$, $\partial_{ij} V \geq 0$, regularity condition on virtual valuations

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All mergers decrease revenue

- Even among smaller firms
- Even if seller responds strategically

Summary

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Definition

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In finance, a euphemism for joint bidding

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In finance, a euphemism for joint bidding

> *"In the course of mounting their "indiscriminate" . . . attack on the syndicate system, the plaintiffs accuse the banks of having "frequent communications among themselves" . . . the sharing of information.*
>
> *It is ludicrous to suggest that communications within a syndicate violate the antitrust laws.*
>
> — *Amicus Brief, Robert Bork et al.*

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In finance, a euphemism for joint bidding

> *"Syndicates . . . should be treated as procompetitive joint ventures for purposes of antitrust analysis.*
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> — *Justice Stevens , concurring with 7–1 decision*

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If I were a Supreme Court justice, it might have been 7–2.