Market Design
for Business-to-Business
Market Makers

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What is market design?

- Market
  - Forum for structured exchange of goods or services
- Market design
  - Determining the structure of exchange
  - Includes:
    - Auction: seller initiated
    - Reverse auction: buyer initiated
    - Exchange: both seller and buyer initiated
    - Negotiation
Major auction families

- Auctions for one or more identical items
  - Sealed bid
  - Ascending bid
    - English
    - Ascending clock
    - Descending clock
  - Hybrid auctions
    - Elimination auction
    - Two-phase auction
      - Sealed bid followed by ascending
      - Ascending followed by sealed bid

Exercise

- 2 bidders (L and S), 2 identical items
- L has a value of $100 for 1 and $200 for both
- S has a value of $90 for 1 and $180 for both
- Uniform-price auction
  - Submit bid for each item
  - Highest 2 bids get items
  - 3rd highest bid determines price paid
- Ascending clock auction
  - Price starts at 0 and increases in small increments
  - Bidders express how many they want at current price
  - Bidders can only lower quantity as price rises
  - Auction ends when no excess demand (i.e. just two demanded); winners pay clock price
Beyond single-dimensional auctions

• Auctions for items with many attributes
• Auctions for many non-identical items
  – Simultaneous ascending auction
  – Auctions with package bidding

Avoid past mistakes

• Specify default penalties (Australia)
• Be sensitive to level of competition (New Zealand)
• Understand implications of pricing rule (CA power purchase agreements)
• Recognize legal constraints (Brazil)
• Do not expect bidders to pay more than they bid (India)
Avoid past mistakes

- Understand implications of payment rule (FCC C block)
- Determine market prices (RCA)
- Help bidders reduce the possibility of a mistake (FCC “fat finger”)
- Mitigate the risk of collusive bidding (FCC “trailing digits”)
- Get it right the first time (Treasury, electricity)

Keep the goal in mind

- Create an efficient auction that minimizes transaction costs of participants
  - Make the pie as big as possible
  - Make it as easy as possible to participate
Maximize gains from trade

• Understand needs of
  – Seller
  – Buyer
• An efficient auction yields high revenues
• An efficient auction encourages greatest participation

Minimize transaction costs

• Satisfy needs of seller and buyer
• Use a transparent process
• Maximize number of transactions
• Control time and pace of auction
• Accommodate existing business relations
• Create long term attractive trading forum
Avoid common pitfalls

- Winner’s curse
- Poor price discovery
- Lack of trust in auctioneer
- Market power concentration
- Bidder collusion
- Circumvention

Define what is being sold

- Need to be precise
  - Use plain and precise language
  - Be exhaustive in listing the attributes
  - Publish the product specification well in advance
  - Present information in a form that is easy for buyers to understand
- How does one determine value
  - Benchmarks
  - Common value versus private value
- High priced versus cheap commodities
- Time plays an important role
  - Buy it now
Bidder qualification

- Who can participate?
- How much can they buy?
- Can the seller participate as a buyer?

Bidding rules

- The role of bid verification
  - differentiating among auction types
  - enforcing auction parameters
  - enforcing permissions
Drivers for selecting bidding rules

• Price discovery
• Post-auction regret
• Elapsed time of auction
• Ability to corral bidders into structured behavior
  – lining them up in advance
  – monitoring requirements on the bidders
• Privacy considerations
• Naturalness

Rule choices

• Multi-unit bidding: (P,Q) pair vs. schedules
• Activity rules
• Proxy bids
• Bid withdrawals
• All-or-none bids
• Minimum opening bids and reserve prices
• Minimum bid increments
• Single items vs. package bids
Clearing and pricing rules

- Tie-breaking rules (rationing rules)
- Pay-as-bid pricing
- Uniform pricing
- Vickrey pricing

Other rules

- Closing rule
  - At 1 pm
  - After 1 pm and 5 minutes inactivity
- Business rules
  - Satisfying business relationships
  - Concentration limits
Information release

- What can be revealed?
  - bidders’ identities
  - bid details
  - reserve prices
- Global market statistics
- Degrees of disclosure, from full disclosure to complete anonymity
- When is information revealed?

Facilitating good decision making

- Those initiating auctions need help in market design
- Those participating in an auction need help in auction strategy
Conclusion

• Lots of practical research questions
  – Market design
  – Auction strategy