Overview: Auctions and Bidding

- Introduction to Auctions
  - Open-outcry: ascending, descending
  - Sealed-bid: first-price, second-price
- Private Value Auctions
- Common Value Auctions
  - “Winner’s curse”
- Auction design affects “gaming” options

Examples of Auctions

- Internet
  - EBay.com, Amazon.com, Liquidation.com
- Government
  - Treasury Bills, mineral rights (e.g. oil fields), assets (e.g. privatization)
  - Electromagnetic spectrum
- Stocks
  - IPO: Google
  - Repurchases
- Procurement auctions/Subcontracting
  - Automobiles: Valeo (GM, Daimler-Chrysler, etc..), Visteon (Ford)
Ways to Categorize Auctions

• Number of objects
  – We focus on single object auctions, but ideas apply to multi-unit auctions
• Role of information / Type of valuation
  – Private value vs. Common value
• Rules of auction
  – Ascending (Ebay or Sotheby’s), first-price (oil tracts), etc..

Auction Formats

• Open outcry auction
  – Ascending Auctions (English)
    • Auctioneer announces ever increasing prices to solicit bids. Continues until only one person left in.
  – Descending Auctions (Dutch)
    • Auctioneer announces decreasing prices until someone puts up their hand.
• Sealed bid auction
  • Everyone puts bids in envelopes and gives to seller at the same time.
  • First price, Second price
Private Value Auctions

- Each bidder knows his/her own valuation.
  ➞ My valuation does not depend on your information

- When is an auction likely not to have purely private values?
  - Resale possible
  - Some bidders are “experts”

Common Value Auctions

- All bidders have the same valuation but they don’t know what it is.
  ➞ My valuation now does depend on your information

- Most real-world auctions have a mixture of private and common values.
Example: Art Auction

- 3 individuals with private values of $60,000, $70,000 and $80,000 for a work of art

- What will happen in the ascending auction?

- What if we used a descending auction?

Ascending vs. Descending Auctions

- Do bidders bid their true valuation in ascending or descending auctions?

- Ascending: Yes - bidding up to your true valuation is the dominant strategy

- Descending: No - each bidder “shades down” his bid.
  - Risk averse bidders shade less
More Bidders Matters

- What if there were more bidders, say with private values of $60,000, $61,000, … , $79,000, $80,000?
- More revenue in both ascending and descending
- Ascending: Second-highest value is now $79,000
- Descending: Less incentive to shade bid since it’s more likely someone else will jump in with more bidders
Open Outcry vs. Sealed Bids

- Second-price auction is equivalent to ascending auction
  - Winner pays second-highest (sealed) bid, virtually same as with an ascending auction

- First-price auction is equivalent to descending auction
  - Same considerations in formulating bids
Bidding for an Oil Block

- Five People will bid, in one-time first-price auction. The top bid gets the block.
- The true value of the field = $X_{true}$, but no bidder knows what $X_{true}$ is. It will be revealed (drilled) after the bidding.
- Each bidder hires his/her own consultant to give an expert estimate of the value.

How Good Are the Experts?

- Oil experts can estimate reserves only with some error.
- The distribution of these types of oil estimates tends to be the following:

  \[
  \text{Consultant's Estimate} = \begin{cases} 
  X_{true} + 40 & \text{w.p. } 1/5 \\
  X_{true} + 20 & \text{w.p. } 1/5 \\
  X_{true} & \text{w.p. } 1/5 \\
  X_{true} - 20 & \text{w.p. } 1/5 \\
  X_{true} - 40 & \text{w.p. } 1/5 
  \end{cases}
  \]

- Given your consultant’s estimate, how much will you bid?
Winner’s Curse

• Winner’s Curse = Tendency to overbid due to the fact that bidder with highest estimate (or signal) will win
  – An issue in all common value auctions, worse with more bidders participating
  – To avoid the curse, simply assume your signal is the most overly optimistic when bidding

• Winner’s Curse ≠ “Money Left on the Table”
Internet Auctions

• Millions of auctions each day.
• Ebay format (most popular site)
  – Ascending auction
  – Second price (pay slightly above)
  – Auction ends *exactly* at a prespecified time
• Amazon format
  – Auction ends once no new bids have been made for 10 minutes (i.e. flexible end time)

“Proxy Bidding” and “Sniping”

• “Proxy bidding” = programming a proxy bidder to bid up to your maximum willingness to pay at the beginning of the auction
  
• “Sniping” = bidding at the last moment

• Do you think sniping is more prevalent on EBay or Amazon? Why?

• What risks are there to submitting a proxy bid?
Bid Rigging

- Bid Rigging can be a big problem!

- PCS (Personal Communication System) auctions (April 1997)

- Marsh & McLennan and commercial insurance
Take Away Points

- Don’t forget the winner's curse
- Auctions are a way to 'discover the right price'.
- In second-price private-value auctions, you should bid your true valuation.
- Auction design influences behavior and performance:
  - More bidders increases revenue.
  - Fixed ending times lead to sniping, which may reduce revenue.
  - First-price auctions may increase revenue when bidders are risk-averse.