

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:

$$\text{Consultant's Estimate} = \begin{cases} X^{\text{True}} + 40 & w.p. \ 1/5 \\ X^{\text{True}} + 20 & w.p. \ 1/5 \\ X^{\text{True}} & w.p. \ 1/5 \\ X^{\text{True}} - 20 & w.p. \ 1/5 \\ X^{\text{True}} - 40 & w.p. \ 1/5 \end{cases}$$

- 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 \neq "Money Left on the Table"

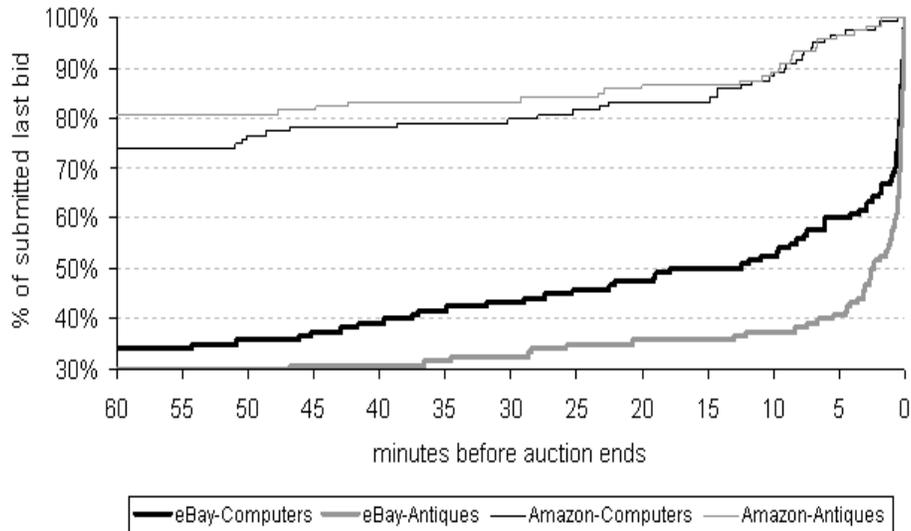
Internet Auctions

- 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?

Cumulative dist'n of auctions' last bids over time



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.