Competitive Strategy: Week 9

Bidding for Contracts

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Types of Auction

- Payoffs
  - Private value: Each bidder i knows their value.
  - Common values: Bidder j's information affects i's value.
- Types of auctions
  - English auction (also called "open auction" or "ascending auction" or "oral auction").
  - First price auction (also called "sealed bid auction").
  - Second price auction.
  - Dutch auction.
  - All pay auction.
- Sales auctions vs. procurement auctions.

Why do Auctions Matter?

- Formal auctions procedures
  - Ebay.
  - Defence procurement auctions.
- Informal auction procedures
  - Bidding war for company.
  - Competition over contract.
- Helps us understand how competition works.
  - When should you promise a supplier a last-look?
  - When should you not go to the cheapest contractor?
  - When should you be wary about entering a market?

English Auction

- There are N bidders.
  - Private values: Bidder i values the object at v_i
- Price slowly rises. When should you drop out?
  - When price equals valuation.
- Price is 2nd highest valuation.

First Price Auction

- There are N bidders.
  - Private values: Bidder i values the object at v_i
- Suppose bidder i bids b_i. Expected utility is

$$(v_i - b_i)\,\Pr(b_i > \max_{j \neq i} b_j)$$

- How determined probability of winning?
- Historical approach
  - What bids have won similar auctions?
  - Treat histogram as distribution of highest competing bid.
- Introspective approach
  - What do you think other's valuations are?
  - How will others bid, given they also maximise utility?

Winner's Curse

A painting contractor (and Paul Milgrom's father):

"I do most of my work for a few builders that I have known for years. My estimates of what it will cost to do a job for one of them come out about right. Sometimes a little high, sometimes a little low, but about right overall. Occasionally, when business is slow, I bid on a big job for another builder, but those jobs are different: They always run more than I expect."

Winner's Curse

- Common value auctions
  - My value depends on your information.
- Examples
  - Bidding on contents of my wallet.
  - Oil auctions (e.g. Texaco's losses).
  - Bidding for a house.
  - Stealing employee from rival.
- Winner's curse (be paranoid!)
  - The bidder who wins the auction is most optimistic.

Winner's Curse cont.

- Response to winner's curse:
  - Shade down estimate
- Suppose signals are normally distributed.
  - If $N = 2$, larger estimate is 0.56sd's above the mean.
  - If $N = 10$, largest estimate is 1.54sd's above the mean.
  - If $N = 100$, largest estimate is 2.51sd's above the mean.
- Example: Suppose $\sigma = \$100,000$ and $N = 100$. If estimate is $\$1,000,000$ then bid $\$750,000$.
- Danger of overconfidence
  - Bidders often think their estimates are better than their competitors.
  - This is rarely justified.

Natural Winners

- Miami Dolphins bought by H. Wayne Huizenga in 1994.
  - Had 15% share-holding. Like 15% discount on bid.
  - Won for \$138m, less than price for expansion team.
- Small advantage can be crucial. Common value v
  - Two bidders, with $v_1 = v$ and $v_2 = v + \$1$.
- Examples
  - Drainage tract is often won by holder of nearby tract.
  - Rail franchise normally won by incumbant.
- Try to gain advantage in common value auction.
- If weak, be wary of competing (you have no value added).
  - Get seller to give you advantage (e.g. last look).
  - Get paid to play!

Costs of Bidding on Contract

- Prospective customer calls you: unhappy with current supplier.
  - Should you bid?
- Unlikely to succeed
  - Incumbant is natural winner.
- Winner's Curse
  - Why is the incumbant letting the customer go?
- Incumbant can retaliate
  - Go after your customers out of spite.
  - Lower prices because nothing to lose.
- Your other customers want a better deal.
- Hurt other customers by giving their competitor a discount.

Selling Strategies: Revenue Equivalence

- Which is best: First Price or English auction?
- Revenue Equivalence Theorem
  - Suppose there are N bidders with private values.
  - Values v_i independently drawn common distribution $F(v)$.
  - Then the First Price and English Auctions raise the same revenue.
- This remarkable result provides the baseline for all auction theory (and won Vickrey a Nobel prize).
  - More generally, different auctions can induce different revenue.

Mitigating the Winner's Curse

- Bidders have two sources of rents
  1. Higher values (or lower costs)
  2. Informational advantages
- Committing to release information
  - Lowers information rents
  - Example: Sotherby's appraisals.
  - Example: Dept of Interior releases geological information.
  - Problem: Commitment.
- Use English auction
  - Process releases information.
- Royalty payments
  - Reduce the downside to over estimating.

Reserve Prices

- Seller should set reserve price above their valuation.
  - Analogy: Monopolist sets price above cost.
  - Lose some sales, but make more money when sell.
- Particularly important when there are few bidders.
- But may reduce number of bidders.
  - To maximise participation, advertise low reserve price.

Collusion (More in Week 11)

- What to do if you suspect bidders are colluding?
- Contact the Competition Bureau.
- Employ a serious reserve price
  - Keep the exact reserve secret.
- Hold infrequent auctions.
  - Bundle objects into large groups.
- Use a first price auction
  - Punishment immediate in English auction
- Contact potential entrants.
  - Pay entrant if necessary.
- Keep identity of winners secret.

Natural Winners

- Suppose you want a new supplier of crankshafts
  - But previous supplier has advantage in auction.
  - Danger: No competition
- Make auction more competitive
  - Subsidize bidder. e.g. 20% bidder credit.
- Hold first price auction
  - Problem: commitment and bid–topping (e.g. takeovers).
  - Promise to give last look to weaker firm.
- High reserve price.

When Not to Use an Auction

Astronaut Alan Shepard:

"It's a very sobering feeling to be up in space and realize that one's safety factor was determined by the lowest bidder on a government contract."

- Suppose quality of contractors is unknown
  - Winner's curse for the seller
  - Lowest bidder may have lowest quality.
- Suppose resources of contractor cannot be observed
  - Lowest bidder may be most likely to default.
- Better to negotiate with one contractor than auction.

Share Auctions

- In takeover wars, firms often bid using shares.
- Reduces cash constraint.
- Mitigates winner's curse.
- Problem: Need to value shares correctly.
  - Winner's curse for the seller.
  - Why did winning firm give me half his company?

Assignment

- You are bidding in a first–price private value auction with value 100.
- Looking at 40 similar auctions the winning bids are: 64 76 63 75 96 65 98 87 83 86 99 87 67 98 102 83 98 90 104 70 88 92 60 84 103 77 82 82 97 64 87 96 92 94 61 98 62 99 92 79.
- You wish to choose a bid b to maximise your profit $(v - b)Pr(\text{win})$. What should you bid? [I advise you to use Excel or a similar program. I use Quattro, where the command @PERCENTRANK will give you the probability a bid b will win.]