A brief view at auction Theory, Week 8

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Agenda

Auction theory plan

- Plan: Discussion of Auction theory
- The idea, people can decide how much to give you
- Useful for thinking about information

Some context

- Hayek, 'The use of knowledge in society'
- The central planner does not have all the information
- People will only give you what they want to give you(birth of incentive compatibility)

Agenda

Four classic kinds of actions

- English: Public increasing bids(1)
- Dutch: Descending Price auction (2)
- First price sealed bid: Self explanatory (2)
- Second price sealed bid: Self explanatory(1)

Agenda

Private value auction

$$E(S_i) = (v_i - B(w_i))F^{n-1}(w_i) + (0)(1 - F^{n-1}(w_i)) \tag{1}$$

$$\rightarrow B'(v_i) = (n-1)(v_i - B(v_i))\frac{f(v_i)}{F(v_i)} \tag{2}$$

$$B(v_i) = v_i - \frac{\int_{\underline{v}}^{\overline{v}} F^{n-1}(t)dt}{F^{n-1}(v_i)} \tag{3}$$

$$\tag{4}$$

If uniform

$$B(v_i) = \frac{n-1}{n}v_i \tag{5}$$

Revenue equivalence

- All direct mechanisms have the same expected revenue
- Limitation 1: Risk averse agents shade less in Dutch and first price
- Limitation 2: Asymmetric distributions, it may result in inefficiency
- Limitation 3: Similar to two part tarrif, reserve price helps

Common value versus private value

- Common value: There is an objective value to the good
- Private value: Value is subjective
- Common value: Winner's curse
- Common value also led to the no trade theorem
- Example: Imagine bidding for a wallet

Linkage principle

- The auction designer has an incentive to maximize information of participants
- Reason: If bidders assymetrically informed, more opportunities for surplus
- If bidders have to look for information themselves, they lower their bids

Contests

- What if everyone pays?
- Marginally willing to bid more than your valuation?
- $v_i F^{N-1}(b^{-1}(b_i)) - b_i$
- Result: People bid less

Conclusions

- A mix of probability theory, microeconomics, industrial organization, differential equations, etc
- Very powerful in the real world, growing in importance
- Narrow but precise