

Announcement: Doug Engelbart was a famous alum who worked for Xerox. He invented the computer mouse. There is a celebration Thursday 3-4p.m. in Woz Lounge, Soda 4th Floor (Northside)

Speaker : Shmuel S. Oren (Nov. 18, 2009)
- Former IEOR department chair.
- Expert on energy markets.

Auctions and Markets

Auction- way to allocate resources or to procure or sell goods, award contracts, sell property rights, allocate scarce resources etc.

1. buy/sell items via internet (ebay)
2. Procurement auctions (B2B)
3. Direct and reverse B2C auctions (yahoo, priceline)
4. Selling art or rare objects - Christies auction house
5. Treasury bond sales
6. Emission rights trading -trading pollution rights by charging people for buying carbon credits. This gives an monetary incentive for companies to reduce pollution.
7. Day ahead and hours ahead electricity procurement (CAISO) - Price of electricity is changing every 5 minutes in auctions. PG&E buys electricity and faces changing prices unlike you.
8. Reserve generation procurement (CAISO).
9. Electric transmission rights
10. Spectrum auction (for PCS brands) - companies need to have right to spectrum so that nobody else can use certain frequencies. effectively, govt. owns the spectrums. it was allocated for free in the past but it caused legal problems. The govt. decided that this way a good way to raise money. The govt. makes tens of billions of dollars for selling certain ranges of spectrum in certain geographic region. This a high stake auctions.
11. Franchise Auctions - City of Palo Alto selling which cable company is going to provide cable service for city.
12. DOD (Department of Defense) supply contracts.
13. IPO share auctions. - Google decided to sell their shares through an auctions rather than directly selling shares to large institutions.

Demo: Pass along a jar of coins ...estimate money in it.

Types of Auctions.

1. Single dimension vs. multi-dimension
 - single item vs. multi item.
 - Multi item: Simultaneous vs. Combinatorial
2. Single unit vs. Multi-unit.
3. One sided vs. Two sided
 - One sided involves somebody willing to sell and someone bidding for the product
 - Two sided involves two sides trying to match seller's and buyer's goals. For example, the stock market matching the buying the seller
4. Sealed bid: Single round vs. Multi round
 - First price: you pay the price you bid to receive the product.
 - Second price: last accepted or first rejected uniform price like ebay. you pay the price of the next lowest bid. Helps u get the best priceminimum price.
5. Open outcry
 - english (ascending) - you see it in the movies 10000 then 10500 1.2.3. done
 - Dutch (descending) - you see it in the flower market. Start it with a very high price. and clock keeps going down. whoever stops the clock get the flowers at that price. (same as sealed bid first price)
 - anglo-dutch (ascending with sealing bid final round)

Auction Rules

1. Definition of Tendre (what is being auctioned).
2. Form of bid.
3. Opening rules.
4. Reservation prices if any (min or max bid).
5. Activity and closing rules (in multi round or open or outcry, ex. timing and increment of bids). One of the rules prevents people from coming in at the middle of the auction to bid. You can't just jump in at the middle. It is called sniping. Ebay rules adds 10 min if people join the auction near the end.
6. Allocation and Settlement Rules.

Auction modeling and analysis

1. Perfect vs. imperfect information.
2. Private value, common value, affiliated values.
3. For multi-item or Multi-unit; Independent values vs. Dependent valises. - sell the item to people who values it more.
4. Combinatorial auctions (set covering bin packing, hierarchical, multi-attribute); Efficiency vs. incentive compatibility, activity rules, bid selections , settlement rules. Example: You will bid higher for the San Francisco bandwidth spectrum if you know

you will also get the Sacramento spectrum because it is more valuable to you if you have both area spectrums to create a combined network.

Second Price (uniform) Auctions (Vickrey Auction)

1. bidders submit bids/offers
2. Best bid wins but pays/gets second best price.
3. For k identical items, k best bids win but pay/get $k+1$ st price.
4. Bidders have incentive to reveal true value/cost
5. -If value is V and you bid $V+a$ second highest bid may be $V + a/2$ so you may end up paying more than you value the item.
- If you bid $V-a$ someone else may bid $V-a/2$ (and pay $V-a$) so you lost an opportunity to get the item for $V-a/2$
6. This auction has truth revealing property.
7. You could end up losing money if you don't reveal the truth.

Pay as bid auctions experiment for Electricity Procurement

1. Subjects (students) control generators with given marginal cost (per MWH) and capacity (MW - megawatt)
2. each subject can submit multiple offers up to the capacity of its generator at any price they want.
3. offers are sorted in increasing price and selected to meet uncertain demand (revealed at selection time)
4. each selected bid gets its offered price times the number of MW taken at that price.
5. Subject remuneration

The people in the business are going to be paid depending on the rate and amount at which power is sold relative to the cost of production. How much they will be able to sell the power at relative to cost of the power. Demand depends on people using the electricity. The curve for the price of the power at auction becomes flatter as people become better at predicting the price. Overall, the price becomes higher because people are not revealing the truth.

Everyone is estimating the value V . The more people that are participating in the auction, the narrower the distribution of bids is.

Winner's curse phenomena - the guy that overestimates the most is winner. You are always the loser because you always pay too much.

This occurs in the bids for Oil tracts in the ocean.

You win the project because you bid too low. Bidders won't participate if there are more than 2 or 3 people participating.

Never participate in a common value auction if there are too many people.

You can take courses in decision analysis to make the right decisions during uncertain situations.

Demo:

The highest bid for \$ 8.10

The actual value was \$4.10.y