# Ascending Auctions

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"Every auctioneer knows that ascending auctions raise the most revenue."

-- *Professional Auctioneer (January 1994)*

# Examples

- Ascending auction: FCC spectrum auctions
  - most exceed industry revenue estimates
  - C-block business plans initially at $20/person; auction ends at $40/person
- Sealed-bid auction: Brazil cellular auction
  - BellSouth high bid at $2.5 billion ($139/person)
  - AT&T second highest at $1.5 billion

# Why ascending bid?

"Who should get items and at what prices?"

- Price discovery process
  - Open and transparent (legitimate)
  - Reliable market prices (learning)
  - Efficiency
    - Single item: quite general; strategically simple
    - Many items: arbitrage and packaging possible

# Why ascending bid?

- Revenue maximization
  - Efficient auctions raise a lot of revenue
    - May be optimal to award to those with highest values
    - Devices to increase revenues often impractical
      - Reserve prices and handicaps
    - Efficiency looks even better in general model
      - Endogenous participation
      - Resale

# Revenue maximization

- Reduces winner's curse
  - Milgrom & Weber (1982)
- Others willing to pay nearly as much
- Not raising is a confession of inferiority

  "If its worth $x to them, why isn't it worth that much to us? Aren't we a good company?"
- Budget constraints can be relaxed

# Why ascending bid?

- Privacy
  - Don't reveal upper part of demand curve
- Implementation
  - Less vulnerable to corruption (don't need secrecy)
  - Avoid commitment problem (don't have to reject later bids)

# Why sealed bid?

- Implementation
  - Don't have to bring parties together
  - Simple
  - Difficult bid evaluation OK
    - Procurement: Quality of job important

# Why sealed bid?

- Ex ante asymmetries
  - If know high valuer wins, then no incentive to bid
  - Almost common value (Klemperer 1997)
    - Ascending bid may lead to low revenues because bids are strategic substitutes
  - Typically not possible to level playing field
    - Price preferences in government procurement

# Why sealed bid?

- Risk aversion
  - First-price better in IPV (Maskin & Riley 1985)
  - But not true with affiliated values
    - Aggressive bidding risky due to winner's curse
  - Not true if bidder is agent
    - Leaving money on the table is risky

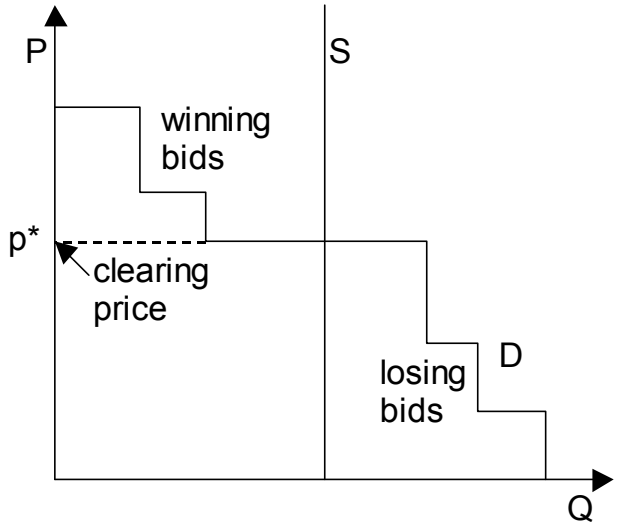
# Why sealed bid?

- Avoid collusion
  - Can't punish deviations in current auction
  - But can punish outside or in another auction
  - Sealed bid not immune from collusion
  - Dynamic process of ascending auction can be used to *identify* and enforce collusive outcome
    - Zero-price equilibria
    - Can be designed to minimize problem

# Ascending auction for multiple items

- Identical items
  - Demand schedules in each round
  - Activity rule (Wilson 1997)
    - Can't increase quantity
    - Must improve a losing bid or bid is rejected
    - Based on revealed preference

## Sample Demand Curve




# Identical items

- Demand schedules
  - Pricing rules
    - Uniform pricing
    - Pay-your-bid pricing
  - Can coordinate on low revenue equilibrium under uniform pricing
    - Wilson (1979) and Back & Zender (1993)

# Identical items

- Ascending clock
  - Clock indicates prices
  - Bidder selects quantity
  - Can't increase quantity as price rises
  - Get uniform price without coordination on low revenue equilibrium
  - But inefficient (Ausubel & Cramton 1996)

# Identical items

- Ausubel (1997) efficient ascending auction
  - Ascending clock, but items awarded when "clinched" at the clinched price
  - Item clinched when it becomes mathematically impossible to lose item (excess demand would drop to zero before you could drop demand to zero)
  - Get efficiency *and* benefits of ascending bid

# Interdependent items

- FCC spectrum auctions
  - some substitutes; some compliments
- Simultaneous ascending auction
  - All items on block at same time
  - Can bid on any items
  - Auction ends when no bids on any item

# Simultaneous ascending auction

- Advantages
  - Reduces uncertainty (winner's curse)
  - Can react to prices in setting bids across items
    - Similar items sell for similar prices
    - Efficient packaging
- Disadvantage
  - May "negotiate" a split of items at low prices
  - But can eliminate undesirable bid signaling

# Conclusion

- Ascending bid typically better than sealed bid on both efficiency and revenue grounds
- Concerns
  - May allow bidders to identify and enforce low revenue equilibrium
  - May do worse if weak competition or ex ante asymmetries