The Auction Space: Beyond Zoology

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What we’ve done so far: zoological categorization

- Auctions
  - Open outcry
    - One-sided
    - Two-sided
  - Sealed bid
    - One-sided
    - Two-sided
A deeper look at what auctions really are

Definition: An auction is any negotiation mechanism that is:

- Mediated
- Well-specified (runs according to explicit rules)
- Market-based (determines an exchange in terms of standard currency)
Auctioneer activities

- Receive Bids
- Disseminate Information
- Arrange trades (clear market)
Auction Dimensions

Bidding rules

Clearing policy

Information revelation policy
Bidding Rules

• Who can bid, when
• What is form of bid
• Restrictions on offers, as a function of
  – Trader’s own previous bid
  – Auction state (everyone’s bids)
  – Eligibility (e.g., financial)
  – ...
• Expiration, withdrawal, replacement
Single-Good Offers

- **General form**
  - schedule: \([ q_1@p_1, q_2@p_2, q_3@p_3, \ldots ]\)
  - “willingness” interpretation

- **Common restrictions**
  - Single price/quantity point \([q@p]\)
  - Single unit \([1@p]\)
  - Monotonicity
  - Divisibility (all-or-none)
Price-Quantity Schedule

Offer: [1@200, 2@140, 4@70]

[10@200, 20@140, 40@70]
Indivisibility (All-or-None)

Offer: [10@200, 20@140, 40@70] AON
Sell Offers

Offer: [−3@200, −1@140]

[−3@200, −1@140, 2@70]
Single PQ Points

Interpretation same as if part of more complex schedule

Offer: [2@140]
Bid Dominance

Current offer: [1@200, 2@140, 4@70]

New offer: [1@260, 3@140] 4@70]
Dominance Special Cases

• Single PQ Point
  – Higher price and quantity
  – Higher price, same quantity
  – Same price, higher quantity

• Single Unit
  – Higher price
Dominance Fine Points, Issues

- Can require increase (NE) or decrease (SW)
- Can distinguish buy and sell side
  - Increase *strengthens* buy, *weakens* sell
  - Need increase on both sides to ensure price progression
- Adding AON weakens offer, dropping strengthens
Information Revelation

• When to reveal information
• What information
• To whom

Sealed bid  Open outcry
Price Quotes

• Generic term for auction summary info revealed at periodic or event-driven times
• “Current Price”
  – ASK quote: Amount buyer would have to offer to be a winner, in current state
  – BID quote: Analogous, for seller
• Other info: quantities, trader IDs, etc.
“Bid-Ask” Spread

- Terminology comes from familiar CDA, as in financial exchanges.
Quotes in Common Auctions

• English
  – BID: highest price so far
  – ASK: + delta

• Dutch
  – BID: undefined
  – ASK: “clock”

• CDA: BID-ASK spread

• Sealed:
Price Quote Timing

- At specified intervals
- On each bid
- On inactivity
- On market clears
Beat the Quote

• General: New offer must increase (or maintain) magnitude of “winning” amount, according to current quote.
• Single-Unit: Buy offer price must meet or beat ASK (and Sell/BID).
• Multi-Unit: OK to ignore “out of the money” amounts.
• Can be applied in conjunction with Beat-your-Own (Dominance).
Clearing Policy

- **Clear**: Translates offers into agreed trades, according to specified rules.

- **Policy choices**:
  - When to clear
  - Who gets what (*allocation*)
  - At what prices
Clear Timing

- At specified intervals
- On each bid
- On inactivity
- On other designated events
Allocation
Pricing Policy

• Uniform vs. Discriminatory
• First (worst winning) vs. Second (best losing)
• Buyers’ vs. Sellers’
• Earliest vs. Latest
• Anywhere in between...
That’s it!