

# BS2243 – Lecture 11

## Auctions

Spring 2010

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### References:

1. Varian, H. (2006). *Intermediate Microeconomics: A Modern Approach*, 7<sup>th</sup> edition, W.W. Norton & Company, New York
2. Binmore, K. And Klemperer, P. (2001). The biggest auction ever: The sale of the British 3G telecom licences, <http://www.nuff.ox.ac.uk/users/klemperer/biggestsept.pdf>

# Why is it important?

- 1974: US Department of the Interior auctions off rights to drill coastal areas in response to OPEC price hike
- 1994: Federal Communications Commission auctions off radio spectrums to be used by cell phones
- 1997: Auction of 3G spectrum in the UK
- 1995 – now: eBay
  - Net operating revenue rose from US\$ 2,165.09 million in 2003 to US\$ 7672 million in 2007

# Jargon – Classification

- Private value auctions
  - When people bid for art, each bidder has a separate valuation for a painting or statue in her mind because its worth varies across individuals
- Common value auctions
  - When companies bid for a oil and gas block, *it is worth the same to all the bidders*, based on factors like how much oil and gas it has in reserves, even though the bids may differ because of differences in information and estimates

# Jargon – Bidding rules

- English auction (ascending with a reserve price)
- Dutch auction (descending)
- Sealed bid auctions (with or without a reserve price)
- Vickrey auction
  - Like the sealed-bid auction but the winner pays the second highest bid
- Escalation auction
  - The highest bidder wins the auction but the second and third highest bidders have to pay the amount they bid as well
  - A related bidding rule is the “everyone pays” auction (think of a politician who takes contribution from everyone but only does the bidding of the largest contributor)

# Why auctions?

- Most likely to allocate a resource to those who can use it best
- Likely to raise much more money than “beauty contests” that cannot use the private information of the bidders
- Criteria for a “beauty contest” are difficult (and hence costly) to specify, and there is scope for inefficient allocation

# Response to popular objections – I

- Auctions are unfair to firms who are forced to bid
  - It is possible that firms feel that they should bid because the new resource being auctioned off might otherwise reduce the value of their current investment
  - But in all European 3G auctions, there were more licences than incumbents, i.e., the prices were influenced by marginal bidders who were outsiders
- Firms pass on the cost of the bid to the consumers
  - This may happen if firms bid royalties that would be derived from the use of the resource in the future, but this cannot happen if the bid involves an up-front lump sum payment
  - There is the possibility of creating “focal points” that makes tacit collusion more likely

# Response to popular objections – II

- Auctions might increase the size of pay out and might therefore reduce the pace of investment
  - This assumes that auctions will lead to bids that are inconsistent with the value of the resource, which goes against the grain of rationality
  - There is indirect evidence from the M&A market that this might actually happen in some cases

# 3G auction – main issues – I

- Problem of entry
  - Incumbents had an advantage over new entrants, and hence attracting bids from non-incumbents was difficult
  - Proposition 1: allow resale of licences and make bidding credits available to new firms (ruled out)
  - Proposition 2: allow new entrants access to 2G network at a regulated price (accepted)
- Royalties vs. lump sum payment
  - Royalties are like the value added tax and can therefore generate deadweight loss
  - Buyers may treat bid as an option to buy and default subsequently
  - Eventually lump sum payment was adopted (raised £22.5 billion)

# 3G auction – main issues – II

- How many licences?
  - Should the “market” determine the optimal number of licences? What is the “market”? Does it include both (telecom) firms and consumers?
  - The cost of designing a mechanism for the optimal number of licences was high, and so a fixed number was chosen, with no firm allowed to win more than one licence
- Legal issues
  - Bids were to be binding
  - The reserve price (if any) had to be binding as well

# Designing the auction – I

- Anglo-Dutch
  - If entry is involved then ascending bids are not ideal; the incumbent can simply wait until a bid is made and then make a marginally higher bid (e.g., Pacific Bell)
  - Sealed bids are inefficient because they do not promote exchange of information
  - Anglo-Dutch: if there are  $n$  licences then there is ascending bidding until there are  $n+1$  bidders left, and then sealed bids are submitted
  - Variations: Each successful bidder pays out the amount it bid, or (alternatively) pays out the amount bid by the  $n^{th}$  highest bidder
  - Problem: since each licence is slightly different from the others, how to distribute the licences among the successful bidders
  - Not used eventually

# Designing the auction – II

- Simultaneous ascending design
  - In the first round, a bidder makes a bid on one licence of choice
  - A bidder who has made the highest bid for one licence in a round cannot simultaneously bid for other licences in the same round
  - At the end of each round, all bids are revealed, and minimum bid increments are set for the next round
  - To remain in the auction, a bidder must remain active
  - Advantages: (a) in each round, the best strategy of a firm would be to bid the amount that would maximise its profits (i.e., no tactical bidding); and (b) for each licence the winner will be the firm that genuinely values it most, such that no surplus can be generated by resale of a licence among the firms