

## Study questions: Auctions

### References

**Theory:** Milgrom and Weber (1982)

**Empirical work:** Hendricks and Porter (1988), Paarsch (1992)

The various standard single-object auction models differ in four important dimensions. Describe each:

1. Symmetric vs. asymmetric
2. Independent vs. non-independent
3. Private vs. common value
4. Auction form: “price-setting” (first-price) vs. “price-taking” (second-price, English)

The mechanism design approach to auctions (or, more simply, the “optimal auctions” literature) uses a more powerful set of tools which eases derivation of many standard results (such as revenue equivalence). We will not discuss this approach. However, this approach is taken in most graduate microeconomic theory textbooks (such as Mas-Coleil, Winston, and Green (1995, ch. 23)). See Myerson (1981) for more details, and Riley and Samuelson (1981) for an explicit treatment of the independent private values paradigm.

### A. Symmetric auctions: Milgrom and Weber (1982)

We will focus our discussion on pp. 1089–1111.

1. In general, describe *why* sellers may want to use auctions to sell goods. Selling mechanisms are often distinguished by their *optimality* (i.e., maximizing seller revenue) and *efficiency* properties. How desirable are auctions as selling mechanisms, using these criteria?
2. It is important to distinguish between *differential* and *asymmetric* information. What is the distinction between them? Are the bidders in the models considered by Milgrom and Weber (1982) differentially or asymmetrically informed, or both? What about in Hendricks and Porter (1988) and Paarsch (1992)?
3. Equilibrium auction theory assumes rational, (expected) profit-maximizing behavior on the part of the bidders. What are the objective functions maximized by bidders for the various auction types?
4. (Technical) Which random variables are the expectations taken over in:
  - The equation 2/3 down p. 1100?

- The proof on the top of p. 1101?
- The proof of Theorem 8, on p. 1102?
- Equations (5) and (6) on p. 1104?
- The series of equations on p. 1106?

5. What are the objective functions which are being maximized in each round of the English auction (cf. p. 1104)?

6. What are interesting and testable empirical implications which emerge from this body of theory?

### **B. Asymmetric auctions: Hendricks and Porter (1988)**

1. What are differences between the auction considered in this paper, and those considered in Milgrom and Weber (1982)?

2. What are the objective functions for the neighboring firm, and the non-neighboring firms?

3. What is the equilibrium behavior posited for non-neighbor bidders, in the Hendricks-Porter model? How does this differ with equilibrium bidding behavior in the models considered by Milgrom and Weber (1982)?

4. Compare an asymmetric private value setting with the asymmetric common value setting considered in this paper. In other words, consider the case where neighbor firms are lower-cost firms. How consistent would this story be with the main empirical predictions of the H-P model, as listed on pp. 870–871? How can you distinguish between these two stories, given the data?

5. In your opinion, what is the main hypothesis tested by Hendricks-Porter? Which sets of results are the most striking?

### **C. Structural estimation of auction models: Paarsch (1992)**

1. What is the empirical question addressed in Paarsch's analysis? Why is this question important?

2. What are the data at Paarsch's disposal?

3. What models does Paarsch test between (i.e., symmetric vs. asymmetric, first- vs. second-price, et. al.)?

4. Paarsch makes various distributional assumptions: Pareto, log-normal, etc. Why are these necessary?

5. How would you test Hendricks-Porter's hypotheses using Paarsch's approach?

6. How would you test Paarsch's hypotheses using Hendricks-Porter's approach?

## References

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