Assignment #5

This class deals with competitive bidding from two perspectives. First, we adopt the perspective of a bidder, who, upon being given the rules under which an auction is to take place, wishes to choose a bidding strategy to maximize her expected reward. The second perspective is that of the auctioneer: what bidding rules are fair, reasonable and encourage bidders to bid in a way that maximizes expected rewards to the auctioneer?

In October 1994, the Wall Street Journal highlighted "...the next—and perhaps the last—great wireless bonanza," the FCC auction of broadband Personal Communication Services (PCS) channels. After intense lobbying efforts by big players and room-high stacks of briefs to the FCC about how the auction should be designed, the FCC arrived at a prescription for the auction, briefly described in the overheads in your readings. Frantic negotiations to form partnerships and to influence (cow) potential competitors followed. The outcome is history. The auction appeared to be successful, but ended up as an unalloyed disaster for the federal government!

READ:

The October 1994 Wall Street Journal article and scan the summary description of FCC auction purposes and procedures that follow it.

Class Outline

This class covers a substantial number of topics rapidly. For this reason, here is a short outline. Following a brief description of the FCC auction we shall:

- Examine features of some common auction designs:
  - Sealed bid auctions:
    - High bidder wins at high bid
    - High bidder wins at second highest bid (Vickery auction)
  - Open outcry auctions:
    - Ascending (English) auction
    - Descending (Dutch) auction

- Analyze strategies for bidding in a competitive sealed bid auction for:
  - a prize of known value; you will bid against your classmates for a prize of $10.
  - a prize of uncertain value; you know the value of the prize to you but your competitor does not; similarly, your competitor knows his value, but you do not. The probability distribution of values is common knowledge.

- Study how to bid when one party possesses an information advantage: the Maxco-Gambit case:
  - Simple Maxco-Gambit → Value v of an oil tract is currently between 0 and 1 (in $10M units). Prior to submitting bids, Gambit will observe the value with certainty. Maxco will not; she will know only that Gambit knows v before bidding.
In a sealed bid auction, how should Gambit bid? How should Maxco bid? In a Vickery auction?

- Real Maxco-Gambit case → In a sealed bid auction for the Alligator Reef Prospect, how should Maxco bid? Gambit? What are the expected returns to their best strategies? You will submit your choice of a bidding strategy for Gambit given the information in the case.
- General lessons for bidding in the face of asymmetric information.

I will give brief lecturettes on each of these topics. You will respond with questions, commentary and suggestions.

READ:

Overheads for "Analysis of Sealed Bid for a Prize of Known Value" then

DO:

(1) The following competitive bidding exercise:

**Competitive Bidding Exercise**

A ten dollar bill is to be rewarded to the highest bidder in a competitive sealed bid auction. If you are the high bidder you win $10−Your Bid Amount. In case of a tie, the payoff will be shared equally.

Record what you would bid if there are N competitors other than yourself for each value of N listed below:

<table>
<thead>
<tr>
<th>N</th>
<th>Your Bid</th>
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<tbody>
<tr>
<td>1</td>
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<td>20</td>
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**Scoring:** For N = 1, your bid will be pitted against each of your classmates. For N = 2, against each possible distinct pair of classmates. For N = 3, your bid will be pitted against a random sample of N ≥ 3 competitors.

Your game score will be computed as the average of your winnings for N = 1, 2, 3.

HAND IN YOUR ANSWER SHEET AT THE BEGINNING OF CLASS.
In many auction situations each bidder may assign a different value to an item being auctioned. I know what value I assign to the prize, but I have to guess about what value you assign to the same prize. Suppose my guesses take the form of assignment by me of a probability distribution to the value that you, my bidding opponent, have chosen as the value of the prize. You are in the same situation.

A stringent pair of assumptions that captures the flavor of this situation is to imagine that each of two bidders for a valuable prize attach identical probability distributions to the value assigned to the prize by his or her counterpart and that this probability distribution is common knowledge.

READ:

(2) The exercise entitled "Competitive Sealed Bidding with an Uncertain Prize" is based on common knowledge assumptions with a twist. Part I is a typical sealed bid auction in which the high bidder wins at the high bid price.

The second part asks you to consider properties of Vickery auction, a bidding scheme in which the high bidder wins at the low bid price. What do you think of this scheme? From the vantage point of the bidders? Of the auctioneer? Which of the two types of auction would you prefer? The footnote from Brams and Taylor (1996) explains why a Vickery auction leads a bidder to bid her value.

Consider how you would answer the questions posed in the case.

Information Asymmetries
A natural extension to the above exercise, in which bidders are symmetric (all uncertainties are both identical for both parties and are common knowledge) is a bidding situation in which there are information asymmetries: one party "knows" much more than another. The Maxco-Gambit case is a classical example: two major oil companies plan to bid for the same offshore tract. The catch is that one of them will know the true value of the tract just before bids are due, while the other will know only that his competitor knows but not what he knows.

READ:

To divide difficulties here—which are substantial—begin by studying the slides that begin with "Bidding with Asymmetric Information" and continue with "Variations on Maxco-Gambit." We will discuss this analysis in class and then move on to the more realistic Maxco-Gambit Case.

Read the Maxco-Gambit case proper.

DO:

Fill in the Gambit bid schedule that you as Gambit would adopt. It is shown as Exhibit 3 in the case.

HAND IN YOUR ANSWER SHEET AT THE BEGINNING OF CLASS.

We tie our discussion together with some insightful rules of thumb about how to bid in such situations. They are summarized in the final set of overheads in your readings for this assignment.