

Sealed Bid Second Price Auctions with Discrete Bidding

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extended abstract:

We analyze a sealed bid second price auction in a framework in which acceptable bids are restricted to a set of discrete values. It is assumed throughout that bidder valuations are independently drawn from a common continuous distribution. When bidder valuations are uniformly distributed, it is shown that there exists a unique symmetric pure strategy equilibrium characterizing bidder behavior. When following this strategy, bidders may choose to bid strictly above or strictly below their own valuation. Under such a selling mechanism allocative efficiency may be sacrificed, in that with strictly positive probability the item will be awarded to a bidder other than the bidder with the highest valuation.

By way of example it is shown that, when choosing the values of an exogenously determined number of discrete bid levels, a revenue maximizing seller may wish to choose a level for the highest acceptable bid either strictly greater than, strictly less than, or exactly equal to the highest possible bidder valuation.

Because of the complexity of the payoff functions of the bidders, it is not possible to specify bidder behavior in general. As a result, a numerical analysis is conducted, assuming that the acceptable bid levels are “evenly spaced” (that is, assuming that the distance between any two consecutive bids is equal to t). Based upon the results of this numerical analysis, it appears as if the expected revenue of the seller will increase as t becomes smaller (that is, as the acceptable bid points become closer to each other). However, the probability with which the item will be awarded to a bidder other than the bidder with the highest valuation does not always diminish as t is made smaller.

Keywords: Second Price Auction, Discrete Bidding.

JEL classification: D44, C7.