

Extra notes on auctions

Simple formats: sealed bid, ascending, descending.

They provide the same revenue to the seller as long as bidders are symmetric, risk neutral and with independent valuations. Otherwise, they perform differently.

Second price sealed bid auction: it is detail-free, that is the bidding strategy does not depend on the distribution. It is easy for everyone to figure out what to do. It is often used for this. Other auctions require bidders to compute a complex Nash equilibrium and to know the distributions of willingnesses to pay.

Reserve prices: it is optimal to set a reserve price because it guarantees a minimum price and in expectation bidders pay more. However, ex post this is inefficient.

Complex environments: require complex auction mechanisms. Optimal auctions are sometimes difficult to implement, then we use non-optimal auctions and get sub-optimal results.

Asymmetric bidders: it is optimal to design different mechanisms. Sometimes, the bidder with the higher willingness to pay does not get the good. This generates a possibility of resale. The seller should anticipate this.

Interdependent valuations: In a common value auction, all bidders value the good equally but they each have a piece of information (signal). For instance bidder 1 only knows his own signal. His estimate is $E[V | s]$. If he wins, this reveals that all other bidders had a worse signal. After winning, bidder 1 revises his estimate which becomes $E[V | s, S < s] < E[V | s]$ where S is the second highest signal. This is called the Winner's curse. Curse must be anticipated to design strategies.

Multi-unit: there are many problems and many questions. For instance, how to design the units, can they be sold separately, if yes, is it optimal to bundle, is it better to sell sequentially or simultaneously? Each situation calls for its own questions