

## **Collusion in Multi-object Auctions: Experimental Evidence**

This article examines the attributes of simultaneous multi-unit auction mechanisms when communication among bidding participants is allowed.

Being an important allocation instrument, multi-unit auctions are however susceptible to the collusion of bidders, which keeps prices at low levels and decrease the revenues of the auctioneer. This experiment tests if this is true by letting the participants chat before and also during the auction. By doing so, they can coordinate their strategies and thereby affect the auction outcome.

The study uses an economic experiment to compare the results of standard auction format Simultaneous Multi-round Auction (SMR) format and its extension with a package bidding rule, the Simultaneous Multi-round Package Bidding Auction (SMRPB) format, which should reduce a possible collusion and increase efficiency when compared to SMR. A simple communication channel – chat – is introduced to both of the mechanisms to provide the bidders with an opportunity to collude. The design therefore results in four experimental conditions.

The article first introduces the concepts of multi-unit auctions and the collusion in auction mechanisms. After stating the hypotheses, it describes the methodology incorporating the design, parameterization and the general procedure of the experiment.

The results of this study suggest that:

- SMRPB format does not bring higher efficiency than basic SMR
- allowing for communication increases efficiency in both examined auction formats
- bidders are able to split the auctioned goods in a cheap-talk collusive agreement, which result in a better allocation compared to the auction formats without the communication channel
- there is some evidence in the experiment that combinatorial bidding on packages may break the collusion.

The results suggest that a clear and simple design of SMR makes the decision problem of bidders easier and manageable in comparison to its combinatorial SMRPB counterpart. The complicated bidding strategies imposed due to the package-bidding rule do not allow for the complete utilization of the allocative potential in complex combinatorial auction formats. This implies that bidding on packages makes the decision-making problem of bidders hard to process and causes inefficiencies, especially for auction designs with a large number of auctioned goods.

A policy implication can be formed on the basis of the results in this paper: when suspicion of potential collusion in an auction is present, the policy-makers should prefer simpler versions of auction formats, which may produce higher efficiencies and revenues. This holds true especially for auctions with a high volume of goods for sale.