

Demand Reduction in Average-Pricing Multi-unit Discriminatory Auction

- Market Consequence of Reciprocal Buyers ?

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ABSTRACT:

We consider a variation of multi-unit sealed-bid discriminatory auction for identical objects with one seller and many buyers. The buyers possess multi-unit demand and they can submit that number of bids. The seller is allowed to submit an ask bid. There, all the submitted bids are listed in the descending order, and take the average from above successively. All the buyers whose bids are included in the average no less than the ask bid win the objects and pay their bids. We label this form of auction as the average-pricing auction. It was employed in the Japanese central rice auction market established to set a standard price in the domestic rice market. We examined the performance of the average-pricing auction in comparison with the standard multi-unit discriminatory auction. We showed theoretically that these two forms of auction share the same Nash equilibrium set which contains a unique proper equilibrium where the ask price coincides with the competitive price. Experimentally, however, we observed a dramatic difference in bidding behavior. In particular, we identified 'demand reduction' phenomenon that impedes the efficiency of the average-pricing auction. This bidding pattern indicates some cooperative conduct among buyers with various values, which is inconsistent with the Nash as well as the collusive behavior. This is exactly what happened in Japanese central rice auction market which was finally abolished in 2011 for its too small volume of transactions.