

Title: Why Bidders Do Not Reduce Demand: A Principal-Agent Model of Bidding Firms in Multi-Unit Auctions

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It is well known that multi-unit auctions set incentives for demand reduction. In contrast, many high-stakes auctions end with high prices which even point to demand inflation. We model auctions where the bidders are firms consisting of a principal and an agent, which can explain such behavior. The agents have limited liability and receive an allowance to bid up to a certain amount of money from the principal to win in the auction. The principal wants to maximize expected profit, while the agent wants to win the package with the highest expected value as the budget is provided by the principal. In a hidden information model, we show that mechanisms where agents have dominant strategies to bid their allowances truthfully are impossible for agents with general valuations. Bayesian Nash equilibrium strategies illustrate possibilities for manipulation of agents. For markets where demand reduction is an efficient equilibrium for quasilinear bidders, we prove a unique non-truthful ex-post Nash equilibrium for the agent to bid only on the large package. Setting allowances to have the agent reduce demand to a smaller package can be impossible for a principal in a first-price sealed bid package auction, which leads to inefficiencies. We show that traditional multi-unit auctions such as the simultaneous multiround auction also lead to high prices, but they are less susceptible to such inefficiencies.