

Competitiveness in Procurement Multi-Unit Discrete Clock Auctions: An Experimental Investigation

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Abstract : Laboratory experiments were run to investigate the impact of different design characteristics of the auctions, which have been implemented to procure capacity in the UK's reformed electricity markets. The experiment studies competition among bidders in procurement multi-unit discrete descending clock auctions under different feedback policies and pricing rules. Theory indicates that feedback policy in combination with the two common pricing rules; last-accepted bid (LAB) and first-rejected bid (FRB), could affect significantly the auction outcome. Two information feedback policies regarding the bidding prices of the participants are considered; with feedback and without feedback. With feedback, after each round participants are informed of the number of items still in the auction and without feedback, after each round participants have no information about the aggregate supply. Under LAB, winning bidders receive the amount of the highest successful bid and under the FRB the winning bidders receive the lowest unsuccessful bid. Based on the theoretical predictions of the alternative auction designs, it was decided to run three treatments. First treatment considers LAB with feedback; second treatment studies LAB without feedback; third treatment investigates FRB without feedback. Theoretical predictions of the game showed that under FRB, the alternative feedback policies are indifferent to the auction outcome. Preliminary results indicate that LAB with feedback and FRB without feedback achieve on average higher clearing prices in comparison to the LAB treatment without feedback. However, the clearing prices under LAB with feedback and FRB without feedback are on average lower compared to the theoretical predictions. Although under LAB without feedback theory predicts the clearing price will drop to the competitive equilibrium, experimental results indicate that participants could still engage in cooperative behavior and drive up the price of the auction. It is showed, both theoretically and experimentally, that the pricing rules and the feedback policy, affect the bidding competitiveness of the auction by providing opportunities to participants to engage in cooperative behavior and exercise market power. LAB without feedback seems to be less vulnerable to market power opportunities compared to the alternative auction designs. This could be an argument for the use of LAB pricing rule in combination with limited feedback in the UK capacity market in an attempt to improve affordability for consumers.

Keywords : descending clock auctions, experiments, feedback policy, market design, multi-unit auctions, pricing rules, procurement auctions

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