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Framework Agreements in Procurement: An Auction Model and Design Recommendations

Abstract: Framework agreements (FAs) are seen as a fast-track, low-cost, low-risk procurement route for public sector bodies. FAs are usually a two-stage procurement process: At the first stage (master), suppliers are pre-determined prior to risk realization; At the second stage (cut-off), the actual contracts are awarded to the selected suppliers after the risk realization. Our focus in this paper is on the price uncertainty and the value of options at the cut-off period to the purchaser. The purchaser faces two types of risk regarding the purchasing price: the first is suppliers' private cost and the other risk is the industrial common shock. We introduce a stylized model for the basic FA whereby suppliers participate in first price auction (FPA) at the the master stage and the winner is the lowest private-cost supplier; and the purchaser buys the product at the cut-off period either from the winning supplier at the winning bid or from the spot market whichever gives the low price. We also consider several options for the purchaser at the cut-off stage to determine the actual allocation and price after the common risk is resolved. One alternative is the flexible FA that gives the winning supplier the option to match the spot market price when he is defeated by the spot market. Another alternative is bargaining FA model that allows the winning supplier bargaining the selling price with the purchaser based on his bid and the spot market price. Finally, we also consider no-commitment model that gives the winning supplier the option to give up the contract when selling is costly, which is called out-of-stock FA. We find that the suppliers with the option of flexibility, bargain and/or no-commitment bid more aggressively at the master stage. We also find that the options of flexibility and bargain save procurement cost for purchaser, but the no-commitment option hurts the purchaser. Joint work with Gabriel Weintraub and Yoni Gur.