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## How to Prevent Default by Winners in Procurement Auctions? Theory, Simulations and Experiments

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## Abstract:

We study and compare the impact of the possibility of default in procurement auctions and to gain insight in the effectivity of different measures. This is a very topical issue, as especially governments buy for billions services from private suppliers and default happens rather frequently in some branches.

We use theory to analyse the analytical structure of payoffs for the auctioneer and the private suppliers. We then use numerical simulations to illustrate the core relationships.

We find that when the suppliers' cost components are uncertain, default becomes more likely. Especially important is the ratio of the post-auction variance in the winners cost to the variance of supplier' pre-auction costs. The higher this ratio, the higher the probability of default. Interestingly, for the probability of default, it does not matter if costs are expected to increase or decrease. The reason is that the auction format competes away most of the trade surplus.

We see three measures having a positive effect. Ordered from high to lower welfare increase for the government: financial bonds, an entry fee and physical pre-investment (See the figure below for the physcal pre-investment PPQ and the financial bonds FB). The mechanisms with which these measures work are rather different, which allows us to test the theory with an experiment. Not only the welfare, price and default outcomes are predicted to be different for the different measures, but also the bidding behavior should be different. In particular, in a second-price auction, suppliers are predicted to bid above their cost with financial bonds, but below their costs with an entry fee and physical pre-investment. The reason is that the expense of the entry fee and physical pre-investment are sunk costs, and are thus not relevant for the bidding behavior.

We are planning an experimental study, and we have a first draft of the experimental design and the experimental computer software.