Analyses of Markets and Auctions

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Abstract

This dissertation studies two aspects of the economics of auctions. The first deals with auctions of paddy (unmilled rice) at a regulated grain market in North India (Chapters 1 and 2). The second analyzes experiments that were designed to detect, identify and estimate the presence of expectations-based reference points in people’s preferences (Chapter 3).

The primary objective of the first chapter is to study whether reserve prices in a North Indian paddy market are set effectively by the auctioneer, in terms of fetching farmers the highest expected revenue possible. Reserve prices that maximize expected revenue are known as optimal reserve prices in the auction literature. This is accomplished by first estimating a semi-nonparametric model for the paddy market.

Using these estimates of bidders’ value distributions, we estimate optimal reserve prices; these are on average 6.4% higher than the observed reserve prices set by the auctioneer, a large and significant difference. We then simulate farmers’ expected revenues from auctions at the optimal reserve prices, and compare them with expected revenues at the observed reserve prices. In sharp contrast to the differences in actual and optimal reserve prices, the expected revenues from them are within 0.5% of each other. We conclude that in the important aspect of setting reserve prices, the market serves to get farmers expected revenues close to the maximum possible.

In the second chapter, we evaluate the two channels or routes through which the government procures rice: the levy channel and the custom-milled rice channel. The latter channel has become predominant, partly because of the argument that it provides minimum price support to farmers. Using the estimates of the first chapter, and simulations, we establish that the levy channel provides equally effective price support in well-functioning auction markets. Secondary data reveal
that the levy channel also imposes a lower unit cost per quintal of paddy procured by the government. We are therefore able to argue that it is efficient to revive the levy channel; and discuss ways to do so.

The third chapter provides a novel experimental auction design, in which (i) an exogenous decrease in the probability of winning, conditional on the bid, reduces the optimal bid of a loss averse agent whose reference point is expectations-based; (ii) observed bid distributions uniquely identify the participants’ latent value distribution and loss aversion parameter. Experimental evidence affirms the presence of such reference points.

The experiment consists of two treatments of a Becker-DeGroot-Marschak (BDM) auction. The treatment effect that leads us to conclude that reference points are present in agents’ preferences exists when a commodity is auctioned, but not when money is auctioned. To corroborate the finding of the treatment effect in our commodity BDM auction, we conduct a separate induced-value BDM auction, in which the treatment effect is absent.

The identification theorem in the chapter, apart from providing a proof of the existence of a unique loss aversion parameter from the bid distributions of the two treatments in the commodity BDM auction, also points to a natural nonparametric estimation procedure (using a quantile approach) to estimate people’s values for the commodity from the observed bids.

We use this procedure and show that at the estimated magnitudes of loss aversion, (a) conventional Becker-DeGroot-Marschak experiments may lead to large biases in estimated willingness to pay (which our design can correct for); and (b) first-price auctions may fetch moderately higher revenue, compared with second-price auctions.