

Bidding behaviour in English and Second Price sealed-bid auctions with risky prizes: an Experimental investigation

Lucia Parisio*
University of Milan†

revised January 2000

1 Extended abstract

Recent theoretical literature considers strategic equilibria for auction games in which the assumption of deterministic valuations is abandoned. Neilson (1994) and Karni and Safra (1986 and 1989) analyse equilibria in English and SPSB procedures where the prize is represented by a private and independent random lottery. Revenue equivalence can be extended to the random-prize setting only if bidders behave as expected utility maximisers. On the contrary, revenue equivalence between English and SPSB auctions fails when bidders' preferences do not obey the independence axiom of expected utility. In this case, it is shown that the revenue ranking of the auction procedures depends upon the way bidders' attitudes towards risk change in response to shifts towards preferred lotteries.

The development of the theoretical literature on auctions with random pay-offs opens a new field of experimental research. Previous experimental literature devoted much attention to the test of revenue equivalence in auctions with deterministic prizes. A recurrent result is that bidding behaviour in the English procedure quickly converges towards equilibrium, whereas agents appear to bid above the dominant strategy equilibrium in laboratory SPSB auctions. It is well known that the observed overbidding at auctions for deterministic prizes cannot be explained on theoretical grounds.

Our analysis is characterised by some distinguishing characteristics in the experimental design which is more sophisticated than the one used for deterministic auctions. The reason is that predictions about bidding behaviour must

*With the usual disclaimers, I wish to thank Profs. John Hey and W. Neilson for their valuable comments on a previous version of the paper.

†Institute of Economics and Statistics, 7, via Festa del Perdono, 20122 Milan, (Italy). Tel: +39-02-58352646; e-mail: lucia.parisio@unimi.it

based upon some independent (non-market) evidence of participants' preferences over risky prospects. Moreover, we have to consider that in the random prize setting the predictive power of preferences on auction behaviour is still an open issue. One might argue that preferences are sensitive to the different environment used to solicit the (conditional) certainty equivalents of lotteries. An alternative view, which we pursue in the paper, is that the environment may influence agents' behaviour for given preferences. The major difficulty in the analysis of our data is represented by assessment of the power of the two elements, namely preferences and non-equilibrium overbidding, in explaining the observed behaviour.

Our experimental results can be illustrated as follows. For the majority of bidders, the outside-the-market behaviour appears to be described pretty well by fanning-out consistent preferences and (approximately equally likely) by EU preferences. On the contrary, fanning-in preferences are less common. The latter evidence is reversed when considering auction data, where fanning-in is most prevalent. On this basis it appears that preferences alone are a poor predictor of individual bidding behaviour in auctions with random prizes. Some validity of the theoretical predictions is obtained when the dataset is restricted to those bidders who did not overbid in deterministic prize auctions.

We finally investigated market behaviour. We found that the individual departures from EUT prescriptions disappear at the market level, so that prices formed in the English procedure are not significantly different from their SPSB auction counterparts. This implies that revenue equivalence prescribed by EUT cannot be rejected at the market level.