Collusion Without Conspiracy: An Experimental Study of One-Sided Auctions

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Abstract

The study investigates collusion-nonfacilitating features of one-sided auctions. We report the results of oral nondescending bid auction experiments in which the strict bid improvement rule was absent, and compare them with the results of sealed bid auction experiments. In the sealed bid experiments the outcomes converged to the competitive equilibrium. In the oral auctions, collusive outcomes emerged and were sustained with bidders using bid matching strategies. We conclude that oral auctions provide opportunities for tacit coordination and collusion enforcement that do not exist under the sealed bid. Therefore, the strict bid improvement rule becomes critical for breaking collusion.

Keywords: auction experiments, tacit collusion

JEL Classification: C92, D44

1. Introduction

The study addresses the issue of sustainability of collusion in one-sided auctions. Earlier experimental studies indicate that, in double oral auctions, collusion is hard to sustain even if conspiracy is allowed and quotation improvement rules are absent (Isaac and Plott, 1981; Clauser and Plott, 1993). Yet, conspiracies can be quite effective in the sealed bid and the posted-offer markets (Isaac et al., 1984; Isaac and Walker, 1985). Clauser and Plott (1993) suggest that the key “collusion-nonfacilitating” feature of the double auction institution is that it presents conspirators with continuous temptation to defect from conspiratorial agreements. Holt (1995, p. 410) also states that the failure of conspiracies is probably due to the strong temptation that sellers have to cut price during the double auction trading. This feature is absent in the sealed bid auctions, which explains the success of conspiracies under the sealed bid institution relative to the double oral auction.

What are the important institutional features that safeguard against collusion in one-sided oral auctions? In this study, we focus on the role of competitive access to market. A standard feature of both double and one-sided English type open outcry auctions is the strict quotation improvement rule, which requires that only the first best offers (bids) are exposed to the markets and can be only replaced by better offers; this guarantees that traders compete with price quotations for access to market. Clauser and Plott (1993) report that in double auctions, this feature is unimportant for “nonfacilitating” collusion. We show that
in one-sided oral auctions, competitive access to market becomes critical in providing for competitive outcomes. If this feature is absent in a one-sided ascending price oral auction, i.e., if bidders are allowed to match the competitors’ bids, and winners are selected randomly from the set of the highest bidders, then collusion can be sustained as a Nash equilibrium within one trading period of such an auction. Bidders may use trigger or bid matching strategies to tacitly coordinate on collusive bidding levels and to sustain collusion if gains from cooperation are substantial for all parties.1

An interesting analogy to a one-sided auction with non-competitive access to market comes from the field of industrial organization.2 In oligopoly markets, meeting competition clause (MCC) is a contractual provision that puts an obligation on a seller of a product to match a competitor’s lower price. Although it appears to protect buyers’ interests, in reality MCC facilitates coordination and collusion enforcement among sellers (Salop, 1986; Holt and Scheffman, 1987). This contractual provision deters price cuts by individual sellers in the market by making the price cuts observable (through buyers’ reports), and other sellers’ responses (i.e., threats to match the price cut), credible.3 Likewise, in one-sided oral auctions, if bid matches are allowed, bidders may deter their competitors from raising prices by matching their bids.

This paper presents experimental evidence to support the above statements. We report the results of a series of weakly ascending oral auction experiments in which the competitive access to market was absent. To highlight the role of the relevant institutional features of the oral auctions, we compare the performance of the weekly ascending auctions with a standard ascending oral auction and with a series of sealed bid auctions.

Theoretical predictions are given in Section 2. Section 3 presents the experimental design. Experimental results are discussed in Section 4. In Section 5, we take a closer look at individual behavior in the weakly ascending oral auction experiments. Section 6 concludes.

2. Theoretical predictions

Let us start with a brief theoretical discussion of the effects of (non)-competitive access to market on the sets of equilibria in oral auctions. We will say that a coalition of agents adopts a collusive bidding strategy if each coalition member’s expected payoff from following this strategy is higher than in the competitive equilibrium, irrespective of actions of agents outside the coalition. Let us call the corresponding outcomes collusive. It is well-known that there are no collusive outcomes that can be supported as Nash equilibria in one-shot sealed bid or English type oral auctions. However, we can note the following.

Observation 1. Consider a weakly ascending oral auction which has a non-competitive access to market feature, i.e., agents submitting equal bids have equal chances of buying the good. Then any collusive outcome, if it exists, can be supported as a Nash equilibrium in such an auction.

To reach a collusive outcome, the bidders in a coalition submit low and equal bids, and thus eliminate competition against each other but secure the item (or items) for the coalition. If no side payments are allowed, at least one bidder has to trade off a low but certain