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Single Bidders and Tacit Collusion in Highway Procurement Auctions

- **Collusion in auctions can take different forms, one of which is refraining from bidding**
- **. Certain aspects of highway procurement auctions facilitate collusive outcomes**
- **We analyze both the bid participation decision and the pricing decision**
- **We include variables that affect firm's' costs as well as variables that capture competitive and strategic effects**
- **Most importantly, we determine the potential service area of each asphalt plant and use that information to determine the potential bidders for each paving project**
- **We find that, in geographic markets with only a few feasible suppliers, county boundaries serve as a coordinating mechanism for softening competition, significantly influencing firms' decisions whether and how much to bid**

Understanding firms' attempts to collude drives much of economists' study of oligopoly. Detection and deterrence of collusion are perhaps the primary challenges of antitrust policy.4 In auction markets, collusion has attracted less attention than a general focus on design mechanisms and other factors affecting the competitiveness of such markets.5 Much of the attention paid to collusion in auction markets has been motivated by price fixing and bid-rigging conspiracies in public procurement auctions

Bid-rigging schemes can take a variety of forms. Sometimes all participants in an auction are part of an overt conspiracy, and then the challenge becomes determining which conspirator will win the auction and how other conspirators will be compensated. Things change somewhat if non-conspirators participate in the auction. Accommodating behavior by co-conspirators often takes the form of submitting complementary bids above (in a procurement auction) the

predetermined winner's bid. If the collusive behavior is overt, it violates federal antitrust laws in the United States

Various methods have been proposed for detecting collusion in auction markets. As Harrington (2008), Porter and Zona (1993), and others have noted, however, refraining from bidding is another form that collusion may take. Such behavior may be overt, if it is the result of explicit communication among firms, or tacit, if it arises without overt behavior. While overt agreements not to bid have been the object of study, we are not aware of any empirical analysis of tacit refusals to bid in procurement auctions.

During the 1980s there were hundreds of bid-rigging prosecutions and convictions in public procurement auctions across the country.8 Since then, government officials have aggressively monitored bidding behavior, and there has been a relatively reduced emphasis on §1 Sherman Act prosecutions since the 1980s. That does not mean that concerns over the competitiveness of bidding, especially in highway procurement auctions, have gone away. Instead, the trend has been toward single-bidder auctions, with resulting higher prices for public transportation projects

The difference that a second bidder can make in highway procurement auctions is sizable. As can be seen in Table 1, in Kentucky during the 2005-07 period 64 percent of asphalt paving projects only had one bidder, and 91 percent had one or two bidders. Winning bids for single-bid asphalt projects averaged 2.20 percent above the state highway engineer's estimate of the cost of the job. Winning bids when there were two bidders averaged 13.62 percent below the engineer's estimate, and with three bidders the low bid averaged 16.82 percent below the engineer's estimate. It is clear that even a single other bidder sharply constrains a firm's ability to raise prices. The nearly 16 percent difference made by a second bidder cost Kentucky taxpayers nearly $100 million of the $593 million spent on paving contracts during the 2005-07 period.

At one level, the goal of this paper is to explore the nature of bidding in highway procurement auctions. At another level, we hope to add to economists' understanding of tacit collusion in oligopoly markets. The primary question is whether so many auctions attract only a single bidder because rival firms are coordinating their bids. We start by reviewing the history of bid rigging in the asphalt industry and methods used to detect collusion in auctions. We discuss how procedural mechanics of highway procurement auctions and economic aspects of asphalt paving create a bidding environment that facilitates coordination in the repeated bidding game that rival contractors engage in. We then determine feasible service areas for all asphalt contractors in Kentucky and analyze bidding behavior to see what factors influence both the

decision to bid and how much to bid. We find that, in many parts of the state, county boundaries create a natural focal point for bidding that helps firms solve their repeated coordination game by refraining from bidding in rival firms' territories.