Nonparametric Identification of Pure Common Value Auction Models with an Application to the U.S. OCS Wildcat Auction (Job Market Paper)

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Abstract

Although pure common value auction models have broad applicability in empirical analysis, nonparametric identification and structural estimation remain challenging in these contexts. In this paper, we establish novel identification results for both the first-price and the second-price sealed-bid auction models in the pure common value framework. We show that the joint distribution of private signals, the seller's expected profit, and the bidders' expected surplus under any reserve price are identified in a general nonparametric class. Moreover, we establish nonparametric identification of the joint distribution of private signals in a second-price sealed-bid auction model with both common-value bidders and private-value bidders. For the pure common value auction models, we propose a semiparametric estimation method and establish consistency of the estimator. Results from a Monte Carlo experiment reveal good finite sample performance of our estimator. Finally, we employ this new approach to analyze data from U.S. OCS wildcat auctions. We show that if the U.S. government had set reserve prices optimally in these auctions using the econometric method proposed in this paper, it would have increased its revenue by 15%, or 246 million dollars.

Keywords: Pure Common Value Auction, Nonparametric Identification, Copula Function, Volterra Integral Equation.

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