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Identification of First-Price Auctions with Non-Equilibrium Beliefs: A Measurement Error Approach*

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Abstract

This paper studies identification and estimation of two models for first-price auctions: (1) bidders' beliefs about their opponents' bidding behavior are not in equilibrium but follow "level- k " thinking, and (2) bidders' values are asymmetrically distributed. Exploiting the nonparametric methodology developed for measurement error models (e.g., Hu, 2008), we show that both models can be identified by a unified methodology. The proposed methodology is applied to U.S. Forest Service timber auction data and the estimation results suggest that bidders hold heterogeneous and non-equilibrium beliefs.

JEL Classification: C14, D44

Keywords: First-price auctions, measurement error models, non-equilibrium beliefs, asymmetric value distributions, nonparametric identification and estimation.

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