

Theory and Market Design

Comments by Susan Athey at the Conference to
Honor Paul Milgrom's Nemmers Prize

Theory of Auctions

- Why pay per click, independent of position?
 - Paul's recent theoretical work shows more expressive auctions lead to lower revenue
- Why not first-price?
 - Edgeworth cycles, documented in practice
- Strengths and weaknesses of Vickrey auctions
 - Ausubel and Milgrom's "Lovely but Lonely Vickrey Auction"
 - Auctions with budget constraints
- Optimal reserve prices
 - See Ostrovsky and Schwarz study of Yahoo! reserve prices
- Generally, tradeoffs between revenue extraction and efficiency

Auction-based Marketplaces

- Conceptualize
 - The size of the pie (efficiency) and the distribution of rents
 - Attracting participants to the platform
- The user
 - Modeling consumer welfare
 - Endogenous clicking behavior
 - The auction as a device for sorting and signaling
- The advertisers
 - Economies of scale, advertiser participation and engagement
 - Richer models of advertiser objectives and behavior
 - The advertisers as econometricians limited by data

Platform Competition

- Theory of two-sided markets
- How can you “disrupt” Google? Theory places limits.
- Sutton models of endogenous sunk costs and competition in investments

Segmentation and Targeting

- “Broad match,” segmentation, and targeting
- Efficiency versus market thickness
- Adverse selection
- Asymmetric bidding and inefficiencies from excessive segmentation

Estimating Theory Models and Generating Counterfactuals

- Develop realistic models of advertiser behavior and equilibrium
- Estimate models using bidding data
- Infer valuations
- Compute counterfactual equilibria
- Monitor advertiser welfare and simulate the impact of changes

Economics is Fundamental to Designing Online Advertising Markets

- Discuss auction design with top executives
 - Names Vickrey, Myerson, Milgrom come up regularly
- Executives commission “marketplace design committee” with economics as core pillar
- Demand for additional engagement by economists, and education in economics
- Computer scientists – familiar with game theory, learning broader lessons of incentive theory and marketplace design
- Economics: years of accumulated knowledge and experience mapping from models to the world and to data
- Frontier of influence is similar to debates within economics community – the realism of models, profit-maximization assumptions, etc.