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.