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SONG YAO

Duke University, Fuqua School of Business
1 Towerview Drive
Box 90120
Durham, NC 27708, USA

Office: (919) 660-2882
Mobile: (919) 218-7909
Email: song.yao@duke.edu
Homepage: <http://www.duke.edu/~sy13>

EDUCATION

- Ph.D., Marketing, Duke University, Expected 2009 (Dissertation Proposal Defended)
Dissertation Committee:
Professor Carl Mela (Chair)
Professor Han Hong
Professor Andres Musalem
Professor Richard Staelin
- M.A., Economics, University of California, Los Angeles, 2004
- C.Phil., Economics, University of California, Los Angeles, 2003

RESEARCH

Research Interests: Quantitative Marketing, Empirical IO, Online Marketing, Auctions, Competitive Strategy, Consumer Management

Dissertation: Two Essays on Online Auction Markets: Sponsored Search Advertising and Auction House Pricing Strategy

- Essay 1: Online Auction Demand
- Essay 2: A Dynamic Model of Sponsored Search Advertising

Publication:

- Yao, Song and Carl F. Mela (2007), "Online Auction Demand," *Marketing Science*, forthcoming.

Abstract: With \$40B in annual gross merchandise volume, electronic auctions comprise a substantial and growing sector of the retail economy. Yet pricing auctions is problematic for two major reasons. First, fee changes are infrequent and, in the face of rapid growth in online auction demand, historical pricing-sales information quickly becomes obsolete. Second, demand for auctions is a result of a complex interplay between two distinct populations: bidders and sellers. I address these problems by developing a model of bidder and seller behavior that enables auction firms to compute fee elasticities in the absence of any historical variation in auction fees. To my knowledge, this study is the first empirical structural model to consider both seller behavior and bidder behavior in the context of auctions.

One insight from this analysis is that commission elasticities exceed per-item fee elasticities because commissions target high value sellers and enhance their listing likelihood. By targeting commission reductions to these high value sellers, auction house revenues can be

increased by 3.9%. Second, by computing customer value as the revenue lost from an attrited customer over the duration of the data, I find the largest seller is worth \$97 to the auction house, even though the seller paid \$127 in fees. This difference is explained by the competitive effects, where the revenue generated by the remaining sellers offsets 24% of the \$127 collected from the attrited seller. In contrast, competition offsets 81% of the bidder attrition effect. In both events, the auction house overvalued its customers by neglecting competitive effects.

Working Paper:

- Yao, Song and Carl F. Mela (2008), “A Dynamic Model of Sponsored Search Advertising.”

Abstract: Sponsored search advertising is ascendant—Jupiter Research reports expenditures rose 28% in 2007 to \$8.9B and will continue to rise at a 15% CAGR, making it one of the major trends to affect the marketing landscape. The large market capitalizations of search engines such as Google, Yahoo and MSN underscore the importance of search engine marketing. In spite of this, little empirical research assumes the vantage point of the search engine; most extant research instead focuses on how search advertising affects the advertiser’s sales. In contrast, I focus on the search engine’s marketing strategy. For example, I explore how information collected by the search engine on consumer clicks can be priced to advertisers in order to enhance search engine revenues. I also consider how bidding rules will affect advertiser behavior and thus search engine revenues. On the consumer side, I consider the role of consumer search tools such as sorting on search engine revenues.

To do this, I develop a dynamic structural model of advertiser and consumer behavior in response to search engine marketing strategies. This structural orientation enables me to infer i) how consumers value search, ii) how advertisers value clicks, and iii) how advertiser bidding behavior for key words varies with changes in their information set or the rules of the key word auction. One key finding is that the estimated conversion rate (sales per click) is about 1.1%, well within common estimates of 1-2% (gamedaily.com). Hence my approach appears to yield valid estimates of advertiser click valuations. Another finding is that customers appear to be segmented by their searching frequency, with frequent searchers placing a greater emphasis on the position of the sponsored advertising link.

Work in Progress:

- Yao, Song, Han Hong and Carl F. Mela, “Search Costs in Online Marketplaces.”

Online shopping portals provide convenient access to product information such as product price and quality. These sites often allow consumers to sort products according to specific criterion such as price. I consider an empirical model to investigate how these tools affect consumers’ search costs and preference in such online environments as well as the implications for portals revenue and webpage design.

- Yao, Song, Han Hong and Carl F. Mela, “Within-Auction Bidding Dynamics, Late Bidding and Efficiency in Online Auctions.”

Online auctions, such as the ones listed on eBay.com, demonstrate the well-documented late-bidding phenomenon—bid activity is concentrated towards the end of an auction. I consider empirical tests for alternative theoretical explanations of the late bidding

phenomenon and explore their implications for sellers and auction house revenues and the efficiency of the online auction marketplaces.

TEACHING

Duke University

- Instructor, Marketing Management, Markets and Management Studies Program, 2007
Average Course Evaluation Score: 4.3/5 (Program Average 4.2/5)
- Teaching Assistant, Product Management, Prof. Carl F. Mela, 2007
- Teaching Assistant, Strategy and Tactics of Pricing, Prof. Wilfred Amaldoss, 2006, 2007

University of California, Los Angeles

- Teaching Associate, Microeconomic Theory, 2003, 2004
- Teaching Assistant, Introduction to Microeconomics, 2002, 2003

Teaching Interests: Marketing Management, Marketing Strategy, High-Tech Marketing, Product Management, Marketing Research, Pricing

HONORS AND AWARDS

- NET Institute Summer Research Grant (with Carl F. Mela), 2008
- Doctoral Fellow, INFORMS Marketing Science Conference Doctoral Consortium, 2006
- Graduate Fellowship, Duke University, 2004-Present
- Graduate Fellowship, University of California, Los Angeles, 2002-2004

CONFERENCE PRESENTATIONS

- INFORMS Marketing Science Conference, Vancouver, British Columbia, Canada, 2008
- University of Texas at Dallas Marketing Conference, Dallas, Texas, USA, 2008
- INFORMS Marketing Science Conference, Pittsburgh, Pennsylvania, USA, 2006

GRADUATE COURSEWORK

Marketing Theory

- Marketing Modeling (Carl Mela)
- Analytical Marketing Models (Preyas Desai, Debu Purohit)
- Marketing Strategy (Christine Moorman)
- Consumer Behavior (Mary Frances Luce)

Econometrics and Statistics

- Econometric Theory I (Guido Imbens)
- Econometric Theory II (Joris Pinkse)
- Econometric Theory III (Charles Mullin)
- Advanced Econometric Theory I (Jinyong Hahn)
- Advanced Econometric Theory II (Ekaterini Kyriazidou)

- Advanced Econometric Theory III (Moshe Buchinsky)
- Bayesian Statistical Models (Mike West)
- Bayesian Generalized Linear Models (David Dunson)
- Computational Economics and Econometrics (Ronald Gallant)

Industrial Organization

- Theory of Industrial Organization I (Harold Demsetz)
- Theory of Industrial Organization II (John Riley, Hongbin Cai)
- Empirical Industrial Organization (Daniel Akerberg, Andrew Ching)
- Empirical Microeconomics (Patrick Bajari)
- Empirical Industrial Organization (Han Hong)

Microeconomics

- Microeconomics I (John Riley)
- Microeconomics II (David Levine)
- Microeconomics III (Joseph Ostroy)

REFERENCES

Professor Carl Mela
 Duke University
 Fuqua School of Business
 Department of Marketing
 Tel: (919) 660-7767
 Email: mela@duke.edu

Professor Han Hong
 Stanford University
 Department of Economics
 Tel: (650) 723-9766
 Email: doubleh@stanford.edu

Professor Richard Staelin
 Duke University
 Fuqua School of Business
 Department of Marketing
 Tel: (919) 660-7824
 Email: rstaelin@duke.edu

Professor Andres Musalem
 Duke University
 Fuqua School of Business
 Department of Marketing
 Tel: (919) 660-7827
 Email: amusalem@duke.edu