

# Introduction to Online Auction Symposium

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September 20, 2007

## Introduction

On October 27 2005, the Federal Trade Commission's Bureau of Economics hosted a conference on the economics of Internet auctions.<sup>1</sup> This special edition of the *International Journal of Industrial Organization* was inspired by the conference and includes papers presented at the conference. The conference had three main themes; fraud and information problems, competition and competition policy, and inference from Internet auction data. These three themes correspond to concerns deriving from the FTC's consumer protection, antitrust and research roles. These three themes are also reflected in the papers presented in this edition.

Internet auctions have become an important way to sell and exchange everything from Beanie Babies to cars and keyword searches.<sup>2</sup> E-commerce's largest companies, including eBay, Yahoo!, and Google, derive a substantial proportion of their revenue from Internet auctions. Internet auctions are increasingly used to sell expensive items such as cars and houses.<sup>3</sup> Google and Yahoo! both use Internet auctions to sell keyword searches and these companies are expanding their use of these mechanisms to sell other

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<sup>1</sup> For more information on the conference go to <http://www.ftc.gov/be/workshops/internetauction/internetauction.htm>.

<sup>2</sup> Google and Yahoo! use auction mechanisms to sell the right to advertise on webpages that show the results from particular searches. These are called "keyword searches" because the advertising is based on the keywords used by the searcher. For example, someone searching for information on Disneyland resorts may view advertising from companies that have bought the right to advertise on any page that shows the results for "Disneyland" or for "resorts" (Varian (2007)).

<sup>3</sup> See Adams (2007) for a discussion of new and used Corvette sales on eBay.

advertising including television spots.<sup>4</sup> Varian (2007) explores the auction mechanism used by Google.

Fraud in Internet auctions is one of largest consumer complaints received by the FTC.<sup>5</sup> However, the success of eBay suggests that these auctions may offer some value. Consider eBay's success in auction used cars, one product that is synonymous with fraud and information problems (Adams (2007)). Yin (2007) tests whether eBay auctions aggregate information and improve efficiency and suggests that these auctions may improve upon standard trading mechanisms. Internet auctions also raise a number of competition issues including competition among users of a particular site and competition between sites. Are there network externalities in Internet auction sites and what are the implications for pricing and competition? This is the question answered in Deltas and Jeitschko (2007). As Internet auctions become more popular as a means of selling and exchanging goods and services, they also become more useful for estimating demand for those goods and services. This question is explored by Adams (2007) and Varian (2007) who look at eBay auctions and on Google auctions respectively.

## **Fraud and Information Problems**

The conference included presentations on fraud and information problems in Internet auctions from a number of academics, including Pai-Ling Yin (Harvard Business School), Chris Dellarocas (Maryland Smith School), Ginger Jin (University of Maryland), Ali Hortacsu (University of Chicago) and Luis Cabral (NYU Stern School of Business). The academic presentations were followed by two presentations by staff from the FTC, one on how the FTC works to combat fraud on the Internet and the other on the reliability of data from the FTC's Consumer Sentinel database.

Pat Bajari (University of Minnesota) provided an introduction and overview of Internet auctions.<sup>6</sup> Bajari highlighted two important results from the academic research.

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<sup>4</sup> Kenneth Li, "Time Warner Mulls TV Ad Auctioning System," Reuters (4/10/06) at <http://today.reuters.com/business/newsArticle.aspx?type=media&storyID=nN10286316>.

<sup>5</sup> For more information go to <http://www.consumer.gov/sentinel/>.

<sup>6</sup> Much of this presentation was based on Bajari and Hortacsu (2004).

First, as shown by Pai-Ling Yin, auction prices fall in direct proportion to the amount of information dispersion in the auction (Yin, 2005). That is, the less information provided by the seller the lower the price the seller receives. Second, sellers lie, at least according to Ginger Jin, about the quality of the baseball cards that they are selling (Jin and Kato, 2002). It is not clear how eBay's feedback system helps solve information and fraud problems, and how such problems impact trade on the site.

Yin (2007) asks whether eBay's auctions actually help to solve information problems inherent in certain markets. Economic theory suggests that in common value auctions, information is aggregated as the number of bidders goes to infinity and this result depends on whether the auction has open or sealed bidding. What happens away from infinity? Yin uses a unique data set that includes both actual auctions for used computers and survey data on the value of the item being auctioned. The results suggest that while eBay auctions may not completely aggregate, sellers who provide detailed and clear product descriptions receive substantially higher final prices.

## **The Biggest Auction in the World**

Hal Varian (University of California – Berkeley) gave the keynote address at the conference. Varian argues that Google's Adword auctions are the largest auctions in the world.<sup>7</sup> Google has about 30 billion keyword auctions per year and is growing at 26% per year. Google began by pricing keywords "by hand". However, this method became unworkable and they needed to automatically price the keywords. At first, Google used a "first-price" auction. That is, bidders paid the amount that they bid. Note that the "product" is a click through: a bidder pays so much money per thousand click-throughs for a position on the screen. Google found that the first price system led to considerable gaming. Bidders would reduce their bids and try to work out the lowest amount to bid and still keep their position. Google found that this behavior was wasting a substantial

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<sup>7</sup> "Adword" is the name that Google uses for its keyword search auctions. See Footnote 2.

amount of computer time so they introduced a “second-price” auction. In such an auction, the winning bidder pays the amount of the second highest bidder.

Varian (2007) shows that Google’s auctions are quite different from an eBay auction or a standard English auction. Google sells multiple “positions” in a single auction. That is, the winner gets the best position on the page, the second highest bidder gets the second best position, the third highest bidder gets the third position, etc. Each bidder pays the price equal to the winner of the position below them and the value of the position depends on the click-through rates which are different for each position. (Note: Google provides bidders with information on the expected click-through rate for each position.) The other difference is that these auctions are continuous. Varian shows that the Nash equilibrium (i.e. each bidder chooses their optimal bid in response to the bids of all the other bidders) of such an auction expenditures will be increasing with the click-through rate at an increasing rate. Looking at actual bids in actual keyword auctions, Varian finds that the theoretical prediction is born out in the data.

## **Competition**

The competition segment of the conference included presentation by George Deltas (University of Illinois) and David Reiley (University of Arizona). Other participants included Rana Kulpreet, Google’s in-house competition counsel, Lorenzo Coppi from Charles River Associates, Hampton Finer from the NYAG’s office, Robert Marshall from Penn State and Bates White, and Lawrence Coffin an eBay seller and trading assistant.

Deltas and Jeitschko (2007) analyze monopoly pricing when there exist network externalities. In the model there is a feedback effect. Buyers want to be where the sellers are and sellers want to be where the buyers are. Importantly, the model assumes that more sellers make the marginal seller more likely to use the site. More sellers beget more sellers. An implication of the feedback effect is that the owner of the site must be concerned about overcharging. If overcharging causes sellers to leave the market, the feedback effect will cause the market to collapse. According to Deltas and Jeitschko, this

means that the pricing power of the site owner may be much less than in a traditional market.

## **Inference From Bid Data**

Vickrey (1961) suggests that bidders in an eBay-type auction will bid their value for the item. This result suggests that auctions sites like eBay could be very important in determining the value of items and thus useful in estimating productivity growth or the potential effects of mergers. The conference's last session included presentations by Axel Ockenfels of the University of Cologne, Robert Zeithammer of the University of Chicago GSB and Robin Sickles (Rice University). The conference ended with panel presentations from Galit Shmueli of Maryland's Smith School of Business, Jeff Hermann of Nielsen Media, Sean Peoples of Edmunds.com, and Ana Aizcorbe of the Bureau of Economic Analysis.

Adams (2007) shows that if the distribution of the number of bidders can be estimated then it is possible to identify demand from observed auction prices. This is important for eBay auctions because while it is not in general possible to know how many bidders in a particular auction it may be possible to estimate the probability distribution over the number of bidders. Adams discusses various instruments that can be used to identify both the distribution of values and the distribution of bidders. The results are then used to determine optimal reserve prices for used Chevrolet Corvettes. Adams finds that sellers set hidden reserves close to what the theory would predict, while sellers who use only starting prices set those substantially below the "optimal reserve".

## **Conclusion**

In organizing this conference and this symposium we hoped to bring together academic researchers and industry professionals to start a dialog that would lead to improvements in our understanding of online auction design and how these auctions work in practice. EBay, Google and other successful Internet businesses rely on online auctions and

attribute their success to the value of these market mechanisms. This symposium and the conference with its associated papers, presentations and discussions greatly increase our understanding of these important market mechanisms.

## References

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