



FACULTY & RESEARCH

Working Paper | HBS Working Paper Series | 2008

On Best-Response Bidding in GSP Auctions

by Matthew Cary, Aparna Das, [Benjamin Edelman](#), Ioannis Giotis, Kurtis Heimerl, Anna R. Karlin, Claire Mathieu and Michael Schwarz

Abstract

How should players bid in keyword auctions such as those used by Google, Yahoo! and MSN? We model ad auctions as a dynamic game of incomplete information, so we can study the convergence and robustness properties of various strategies. In particular, we consider best-response bidding strategies for a repeated auction on a single keyword, where in each round, each player chooses some optimal bid for the next round, assuming that the other players merely repeat their previous bids. We focus on a strategy we call *Balanced Bidding* (BB). If all players use the BB strategy, we show that bids converge to a bid vector that obtains in a complete information static model proposed by Edelman, Ostrovsky, and Schwarz. We prove that convergence occurs with probability 1, and we compute the expected time until convergence.

Keywords: [Online Advertising](#); [Auctions](#); [Bids and Bidding](#); [Game Theory](#); [Mathematical Methods](#); [Competitive Strategy](#);

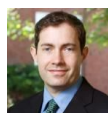
Language: English Format: Print 19 pages [Read Now](#)

Citation:

Cary, Matthew, Aparna Das, Benjamin Edelman, Ioannis Giotis, Kurtis Heimerl, Anna R. Karlin, Claire Mathieu, and Michael Schwarz. "[On Best-Response Bidding in GSP Auctions](#)." Harvard Business School Working Paper, No. 08-056, January 2008.

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