

# On the optimal number of the ad-slots for keyword auctions

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Current version: January 2010

## Abstract

Internet advertisements that are shown along with the search results for a keyword or a combination of keywords are sold through keyword auctions. In this paper, we explore the optimal number of the ad slots that maximizes the auctioneer's revenue. We consider two different situations both of which approximate the problem faced by the search engines. One is a game with complete information among the bidders participating a keyword auction and the other is a game with incomplete information among them. By applying some refined concepts of equilibria, we show that the expected revenue of the auctioneer is the same between the two situations. Moreover, we provide a sufficient condition for the determination of the optimal number of the ad-slots. Applying this condition to the case that bidders' valuation are distributed according to uniform distribution, we show that the optimal number of the ad slots is half of the number of the advertisers. *JEL classification:* C72, C91, D44. *Keywords:* Keyword auction, Generalized second price auction, Optimal number of ad-slots.

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