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Advertising and search engines. A model of leadership in search advertising

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ABSTRACT

We analyze the role of leadership in a multi-sided market as search advertising, assuming quantity competition and different entry conditions (with barriers to entry or endogenous entry). The model can be microfounded taking into account network effects, multi-homing on the advertising side and scale in search. If there are barriers to entry and the network effects are strong, there is an incentive for the leader to exploit them and attract more consumers to monopolize advertising. Under barriers to entry, the leading platform has also a strategic incentive to exploit scale in search, to manipulate search results to divert search traffic from other platforms, and to introduce limits to multi-homing, with the aim of expanding its market share and deny scale to competitors.

The theoretical analysis of market leadership is crucial to understanding abuse of dominance issues in imperfectly competitive markets. This paper provides a first theoretical exploration of the role of leaders in multi-sided markets, that is, markets where firms compete by charging multiple sides at the same time, as in the case of the market for search advertising. The economics of multi-sided markets has recently attracted a lot of attention from economists (Rochet and Tirole, 2003, 2006; Caillaud and Jullien, 2003; Armstrong, 2006; Veiga and Weyl, 2012) because it characterizes a number of important markets of the New Economy and generates a number of new intriguing antitrust issues. In particular, a wide interest has been focused on the market for search advertising, whose dominant firm at the global level, Google, is currently being investigated by a number of antitrust authorities. Analyzing this market, it emerges that possible abuses may include preferential treatment for Google's own services in its free ('universal') search aimed at drawing off more consumers from vertical search engines, manipulation of the opaque bidding system for sponsored links leading to lower rankings for competing platforms, and contractual restrictions on other platforms and advertisers. However, the theoretical debate on the role of market leaders in multi-sided markets is still limited: most of the literature on multi-sided markets is focused on monopolistic pricing and symmetric price competition between platforms, not on competition for ads between a potentially dominant platform and its followers.

In this paper, building on the literature on strategic commitments under different entry conditions (Fudenberg and Tirole, 1985; Etro, 2006) and its recent applications to antitrust and contract theory (Etro, 2010, 2011), we advance new insights on modeling leadership in multi-sided markets. As usual, the incentives to adopt different strategies or pre-commitments depend on the entry conditions and on the impact of those strategies or pre-commitments on marginal profitability. We argue that online advertising can be realistically characterized by a fixed number of players in the short-medium run and we examine the impact of different pre-commitments on the equilibrium of this multi-sided market. Our analysis of a Stackelberg duopoly in search advertising suggests that a platform that has reached dominance may have

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different incentives depending on the strength of the underlying network effects. If the network effects are strong, there is an incentive to exploit them and attract more consumers to monopolize the advertising side, but when they are weak or already exploited there is an incentive to restrict quality and size of services to consumers to reduce the marginal cost per click: this may penalize competition. The results extend to the case of Stackelberg leadership with endogenous entry, but in this case the strategy of the leader does not affect the strategies of the followers and their prices for the ads.

We also show that the dominant platform has incentives to overinvest to build 'scale in search' (by improving the search algorithm), which creates a barrier to entry, and to adopt other practices that restrict competition. One of the problematic issues in the conduct of a dominant firm in search advertising is the manipulation of search results aimed at penalizing alternative search engines. This may take place in two ways: first by according preferential treatment to natural search results that link to the vertical search services of the dominant platform, and second by lowering the 'Quality Score' for sponsored links of competing vertical search services, meaning that the advertising company is obliged to pay more to have its ad appear higher when a given key term is used in a search. Both practices penalize competing platforms. Two arguments are typically adduced to suggest that the dominant search engine would not engage in abusive manipulation of search. The first argument is that though any platform has the capacity to bias its search results, if the dominant platform pursues an 'abnormal' degree of manipulation, it will lose credibility and ultimately web-visitors, because consumers can compare and evaluate results obtained from different search engines (which are one click away). This is questionable because consumers have limited information and bear high costs to compare and evaluate the quality of search engines, especially in the case of marginal manipulation on a limited number of searches. The second argument is that a dominant firm that manipulates quality scores is acting against its own commercial interest by sacrificing potential revenues arising from clicks on competitors' sites that are popular and would be clicked on frequently if their positioning in the sponsored links was not subject to manipulation. This argument is also open to challenge because competition from and between other platforms is limited and biased in favor of the dominant firm, which can ultimately hurt consumers. For both forms of manipulation, however, the crucial issue is not whether there are costs from influencing search rankings, but whether the dominant platform has higher incentives to manipulate its own search results compared to other platforms so as to limit competition from them. We show that this may be the case: there are extra strategic incentives to manipulate both paid and unpaid search to increase advertisers' willingness to pay to appear prominently on the dominant platform and to conquer a larger market share. The same occurs for the imposition of contractual limits to 'multi-homing' by advertisers (such as contracts forbidding advertising on other platforms or that impose additional costs on or otherwise hamper the portability of online advertising campaign data), which are again adopted by a dominant firm to limit competition.

As far as we know, this is the first analysis of asymmetric competition between leaders and followers in multi-sided markets, even if it belongs to a growing body of literature on antitrust issues in multi-sided markets.[1] Additional research appears fruitful to better understand the structure of these markets. This may finally provide new and solid results on what could be the remedies to possible antitrust abuses. The preliminary impression from our investigation is that any intervention aimed at promoting endogenous entry in the market would refrain the leading platform from adopting strategies that may hurt competition and consumers.

The paper is organized as follows. Section 1 motivates our analysis describing the multi-sided market of search advertising and introducing details of the Google case. Section 2 show a simple model of search advertising with network externalities and multi-homing, considering both exogenous and endogenous entry in symmetric equilibria. Section 3 analyzes Stackelberg equilibria in which a platform is leader and discusses the role of additional strategic commitments. Section 4 concludes.

1. The market for search advertising

The motivation for this paper derives from recent scrutiny by the leading antitrust authorities on a prominent multi-sided market, namely that for online advertising, which is dominated by Google at the global level. In November 2010 the European Commission opened an investigation into potential abuses concerning the preferential treatment for Google services in its free search engine, the manipulation of the pricing system for sponsored links, and exclusivity clauses or other restrictions for advertisers using Google services. In particular, the potential abuse is about (1) 'allegedly lowering the ranking of unpaid search results of competing services which are specialized in providing users with specific online content such as price comparisons (so-called vertical search services) and by according preferential placement to the results of its own vertical search services in order to shut out competing service', (2) lowering the 'Quality Score' for sponsored links of competing vertical search services, (3) imposing 'exclusivity obligations on advertising partners, preventing them from placing certain types of competing ads on their web sites, as well as on computer and software vendors, with the aim of shutting out competing search tools', and (4) imposing 'suspected restrictions on the portability of online advertising campaign data to competing online advertising platforms'. The investigation started with the complaints of some European companies in 2010: a UK price comparison site (Foundem), a French legal search engine (eJustice) and a comparison shopping site (Ciao!). At the time of writing, the European Commission has requested Google

[1] See Evans (2003), Economides and Katsamakas (2006), Affeldt et al. (2012), Etro (2012) and Motchenkova et al. (2012).