
ABSTRACT

Traditional advertising mediums such as TV, Radio, and Print were broadcast based affording access to large audience(s). The unit of buying an advertisement slot (time or space) was that the medium could reach. As a result, advertising investments comprised high fixed costs. In contrast, new age online advertising markets such as advertising markets on search engines, enabled by information and communication technology, allowed reaching out to individual users surfing the web using a search query or keyword. On search engines, advertisers only pay for clicks on their ads. Consequently, the nature of investment in advertising changed from one of high fixed cost associated with reaching

advertising markets. Thus, one would have expected a fragmented market structure in online advertising markets. However, fragments of available empirical evidence point towards high concentration in search engine advertising markets (SSMs). This research enquires into these seemingly contradictory observations wherein the micro design of individual transaction is access friendly but the market at an aggregate level (all transactions) exhibits high concentration.

This research is an endeavour to theoretically understand SSMs from a systemic perspective while remaining close to real life advertiser practices gleaned through an ethnographic immersion. Towards this end, this research uses an agent-based model that employs a novel way to integrate the structure of semantic relationship between search queries, captures the real life advertiser practices of account management, and incorporates the rules and mechanisms used by the search engine to govern the market. The agent-based model built, integrates various strands of literature in SSMs and enables setting up of experiments that shed light on a systemic understanding of the market. With an over-arching goal of understanding how the systemic characteristic of high concentration emerges in SSMs, where

price paid per click operating at the portfolio level] can endogenously make sponsored search markets concentrated. Simulating counterfactual markets with different time windows used for CTR computation explicates the complex relationship between window size used to compute CTR, the strength of increasing return dynamics, and the optimization practices of the advertisers. It is found that market concentration has a counter-intuitive non-linear (inverted U) relationship with the size of the time window used for CTR computation. This is particularly interesting because counter to the observed results, both intuition and theory of increasing returns would suggest that as the size of window is increased the strength of reinforcing dynamics would be stronger and a higher concentration would be observed.

The second enquiry looks at sponsored search markets from the lens of market or resource

and M-keywords, thereby, departing from the dominant single advertiser (or single keyword) approach used in analytical models that dominate existing literature, (2) relational modelling of keywords that helps relax the assumption of independent valuation of keywords, and (3) - heuristics, thus,

representation of the real market. Such a model allows analysis along different dimensions which include search query valuation, cost analysis for an individual advertiser, search

different classes of advertisers, and distribution of clicks of all advertisers at an aggregate level. The ability of agent-based models to -

contributes towards theory building by affording a nuanced understanding of the phenomenon. The three components taken together provide a holistic view of sponsored search markets where heterogeneous advertisers having different scope of operations, following different bidding heuristics compete against each other for clicks on their ads under