

DISSERTATION DEFENSE

Ashish Agarwal

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384 Posner Hall

Essays on Economics of Technology Markets

Markets for information technology products and services are constantly evolving. In order to ensure success, there is need to understand how consumers make their choices in these markets, how vendors make strategic design decisions and what are the performance implications. I investigate the outcome of these choices in two different technology markets: online advertising services and software products. In my first dissertation essay I empirically evaluate the performance of online advertisements and identify the gap in the auction mechanism used by the search engines to select ads. In my second and third essays I evaluate the product complementarity and pricing choices made by software vendors and the social implications of these choices using game theoretical approach. A brief description of my research follows:

Essay 1: Location, Location, Location: An Analysis of Profitability of Position in Online Advertising Markets

Sponsored search accounts for 40% of the \$ 20 billion online advertising market. These ads appear as ordered lists along with the regular search results in search engine results pages. The conventional wisdom in the industry is that the top position is the most desirable position for advertisers. This has led to intense competition among advertisers to secure the top positions in the results pages. Using a hierarchical Bayesian model, I measure the impact of ad placement on revenues and profits generated from sponsored search using data from for several hundred keywords from the ad campaign of an online retailer. I find that the conversion rate and the revenue first increase and then decrease with position. The net effect is that, contrary to conventional wisdom, the topmost position in sponsored search advertisements is not necessarily the revenue- or profit-maximizing position. My results inform the advertising strategies of firms participating in sponsored search auctions and provide insight into consumer behavior in these environments. Further, they reveal potential inefficiencies in present auction mechanisms.

Essay 2: Beyond Plug & Play: Can Software Products be really compatible?

Customers in markets such as software buy one or more products to meet their individual requirements. If the vendors enter into an alliance (form links) and make the products mutually compatible, customers can derive additional interaction utility by consuming the compatible products. The magnitude of the interaction utility and the choice of alliance partners are strategic variables. I use an oligopoly setup to study the vendor incentives for these choices in a market for two products. I find that the vendors prefer not to have identical links with all the complementary products (industry wide links) in many scenarios. I also find that industry wide links are not always socially desirable even if they are feasible. My results have important implications for the vendors, emerging integration technologies and standard setting bodies.

Essay 3: Compatibility and Pricing: Interaction between a platform and an application

In the software industry, a platform is used to run software applications. As the successive generations of platforms are introduced, consumers may or may not buy the new version. This breaks the dependency between the platform and the applications running on it. The platform provider can also enter the applications market and consumers face a choice between buying the application from the original vendor and buying it from the platform provider. The platform vendor can influence the compatibility of its platform with the application and use pricing strategies such as bundling to compete with the application. I evaluate these choices using a game theoretical model. I find that a platform vendor can bundle its application with the platform even if it is of lower quality and make higher profits. However, for this to be possible, it should choose to be compatible with a competing higher quality application. This results in some customers buying both the high quality and low quality application (as it is bundled with the platform). I show that the applications vendor always has an incentive to build an adapter if it is possible to make it unilaterally. This in turn increases the platform vendor's incentive towards compatibility. I also find that compatibility results in socially excessive bundling.