D I S S E R T A T I O N D E F E N S E

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"Essays on Internet and Network Mediated Marketing Interactions"

My dissertation focuses on marketing interactions enabled by Internet and networks. The advancement of Internet and electronic technology has led to ever richer interactions of consumers and firms. Such interactions often occur in and are mediated by networks, which present an exciting opportunity for marketing research. My dissertation consists of three essays, each focusing on a specific interaction in this area. In my first essay, "A 'Position Paradox' in Sponsored Search Auctions", I study how quality differentiated firms bid for online advertising positions when they explicitly account for consumers' knowledge structure and search behavior. This study uses a game theoretic approach. Features such as click-through-rate and value-per-click, often taken as exogenous in extant literature, become endogenous in this setting. Modeling at this lower level of primitive reveals an interesting position paradox, where a low quality firm bids higher than a high quality firm, is placed higher, yet still receives fewer clicks. Analysis shows that explicitly modeling consumer search is essential for understanding the key drivers of auction outcome, including "residual demand", i.e. the amount of clicks a firm can receive at lower position, "incremental value", i.e. the additional value a higher position offers, and "differential cost", i.e. the different cost implication of informed consumers to both firms under pay-per-click.

In my second essay, "Homophily or Influence? An Empirical Analysis of Purchase within a Social Network", I study consumer's product purchase in a social network environment. Consumers who are close to one another often behave similarly, attributable to either their intrinsic similarity, i.e. an "unobserved homophily" effect, or their influence on one another. Teasing out the two factors is important for target marketing. In this study, I use a dynamic model to incorporate both factors, where identification is achieved through separating static product taste from dynamic influence arising from communications, and estimate it using a dataset obtained from a large Indian telecom company, which contains information on repeated purchase and communication. I find strong homophily effect in consumer's product choice decision. In contrast, the purchase timing decision is heavily influenced by others. I show that ignoring either effect will lead to an overestimation of the other. Furthermore, I show that detailed communication data is crucial for accurately evaluating influence effects.

In my third and final essay, “A Dynamic Competitive Analysis of Content Production and Link Formation of Internet Content Developers,” I study how Internet content developers compete for viewership through producing content and linking to one another. Hundreds of revenue sharing content websites have greatly contributed to the recent proliferation of social media. Content at these websites is supplied by external developers, whom the websites attract through revenue sharing. This leads to a competition for viewership among developers at a website. A feature recently introduced at many sites, namely allowing developers to link to one another, brings intriguing interactions to this competition. I develop a dynamic oligopoly model, following the framework of Ericson and Pakes (1995), to investigate the interaction of production and linking decisions of content developers, the tradeoffs they face over time, and the resulting market structure. The model is estimated using the data obtained from a popular Internet product review site, applying the two-step estimator recently developed by Bajari, Benkard, and Levin (2007). I find that reciprocal links are naturally encouraged by a promote-the-promoter effect, which then induces certain developers to strategically initiate non-reciprocal links, in anticipation of reciprocation. I find that the prospect of receiving incoming links can either encourage or discourage content production, depending on the situation a developer is in. Furthermore, I find that although both more content and higher network position increase viewership, only the latter leads to higher net benefit once cost is accounted for. This suggests that linking may impede competition, by giving competitive advantage to a subgroup of content developers, and policy simulation suggests that limiting links could lead to higher overall viewership at the website.