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Learning tastes through social interaction☆

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ABSTRACT

This paper offers an information-based model of social interaction, and analyzes optimal investment and pricing of services that facilitate interaction in a duopoly. Agents have uncertainty over their preferences but are aware that they are correlated with others', so there exists an incentive to communicate with others in the population. When a firm's good can be bundled with a coordination mechanism for its consumers, its value is endogenously determined due to a consumption externality. Although this mechanism increases total surplus, it is underprovided and consumer surplus decreases.

1. Introduction

Engaging in social interaction through coordinated activities is a ubiquitous activity in modern society. Individuals have long met physically through clubs and community groups, and more recently can meet virtually through social networking websites. This paper studies consumers' demand for social interaction in the presence of a learning incentive, and firms' strategic investment and pricing choices when they have an opportunity to provide services that facilitate their consumers' interaction. I propose a model in which agents wish to "meet" with similar types in order to obtain information. They each have imperfect information about certain dimensions of their own tastes, but are aware that their preferences are correlated with others' in the population. I assume that agents can only communicate with those who have chosen common actions, a constraint that may be technological or physical, since doing so facilitates information exchange by enabling easier identification of like-minded individuals.[1] For example, those at a bar or club can only communicate with others who are present, while membership is a prerequisite for communication on social networking websites and internet forums. In

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[1] More generally, I could assume that agents can communicate more easily with those who chose common actions than those who did not. In this case, the qualitative results would be unchanged.

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equilibrium, agents infer that others are more likely to be similar to themselves if they share common actions. Thus, the desire to "meet" and learn from others results in an endogenous value of matching and the formation of reference groups through coordinated actions. The following example illustrates the model's intuitions. Suppose two Bostonians have preferences over bars in three different cities: Boston, Chicago, and New York. For each city, its set of bars is represented by a separate Salop (1979) circle whose twelve bars are located at each of the hour markings on a clock dial, and numbered accordingly. Agent A knows his favorite bars in Boston and Chicago, but has never been to New York. Likewise, Agent B knows his favorites in Boston and New York, but has never been to Chicago. Agent A's favorite Boston bar is the relatively obscure bar 8, but he decides to patronize the more popular bar 7 to increase his likelihood of meeting someone who has been to New York. There, A learns that B goes to New York's bar 7, from which he infers that the mapping between favorite Boston and New York bars is that the New York favorite is located at the same clock position as the Boston favorite. So A happily patronizes New York's bar 8 when he visits in the future. Likewise, learning about A's Chicago bar allows B to infer where he should go in Chicago when he visits. Thus, because they are aware that others' preferences are correlated with their own, they patronize the more popular bar 7 in Boston to increase the likelihood of meeting others and learning information.

Given the demand for coordination to expedite information exchange, firms have an obvious opportunity to supply some coordination service for their customers by increasing the recognizability of their consumption decisions. I assume that firms can invest in a "meeting" technology that is accessible only to their own customers and that facilitates their customers' "meeting" with one another and sharing information. Thus, this coordination service is bundled with the good or service itself. I assume that this investment is an initial, one-period fixed cost that has no effect on the future marginal costs of production, like setting up the technology's physical or virtual infrastructure. For example, a bar can organize events like trivia nights, or provide infrastructure like pool tables, to facilitate interaction among its patrons. Wine retailer WineStyles creates clubs and organizes events for its customers to meet in person, while Harley Davidson organizes events and operates a members-only Internet forum for Harley owners. I analyze equilibrium investment in a duopoly and, surprisingly, find that although total welfare increases, all consumers are worse off when the meeting technology exists than when it does not. In contrast to previous findings of "max-min differentiation" under multi-dimensional product differentiation (Economides, 1993; Dos Santos Ferreira and Thisse, 1996), I also find that firms differentiate maximally in both vertical (i.e., technology strength) and horizontal attributes (i.e., product variety). Only one of the two firms chooses to invest in the service even if such investment is costless, yet both firms charge sufficiently high prices that consumers are actually worse off than if a coordination service could not exist. This result occurs due to the presence of a consumption externality that weakens the firms' incentives to increase demand. Moreover, the meeting technology is underprovided relative to the social optimum.

The paper is organized as follows. Section 2 links this paper to related research. Section 3 describes the basic model. Section 4 illustrates the demand for coordination by solving for a pooling equilibrium, where agents choose identical actions that may diverge from their known tastes in order to learn from one another. Section 5 extends the model to include supply of the information-sharing mechanism through duopoly investment in a meeting technology. Section 6 concludes. Proofs are gathered in the Appendix.

2. Literature review

This paper connects several lines of research. First, it relates to the bodies of work on consumption in social contexts and peer effects, and on word-of-mouth and social networks. It also contributes to the work on multi-dimensional product differentiation.

Much attention has been devoted to consumption in social contexts. In marketing, Muñiz and O'Guinn (2001), O'Guinn and Muñiz (2005) discuss the role of brands as a channel for community formation because they serve as visual identification of others with similar tastes or beliefs. Kuksov (2007) considers the value of brands as a signaling device when agents engage in costly search for partnerships. In economics, consumption has been interpreted as a form of status signaling when identity is known and social preferences are a primitive of the model (Pesendorfer, 1995; Bagwell and Bernheim, 1996; Corneo and Jeanne, 1997, 1999). Though factors such as status may also play an important role, I propose an alternative motivation for the existence of coordinated consumption that endogenizes the costs and benefits of matching with others due entirely to a learning incentive.

This paper is also closely tied to the literature on peer effects as a source of consumption externalities. Peer effects on consumption can arise by entering preferences directly (Bernheim, 1994; Austen-Smith and Fryer, 2005), through imperfect information and social learning (Banerjee and Besley, 1991; Battaglini et al., 2005), or from technological innovations like recommender systems (Bergemann and Ozmen, 2004; Kuksov and Xie, 2010). Here, I contribute to the limited literature on firms' response to consumption externalities due to consumer communication by considering how a meeting technology enables individuals with imperfect self-knowledge to observe and learn from others.

This paper relates to the study of word-of-mouth and social networks by studying endogenous reference group formation to expedite communication about tastes. The word-of-mouth literature has primarily examined the role of sequential social learning in the creation of herding and information cascades (Bikhchandani et al., 1998). One line of research studies the effect of communication structure on information aggregation and efficiency when agents are boundedly rational (Ellison and Fudenberg, 1995; Bala and Goyal, 1998, 2001). Another analyzes firms' decisions and consumer welfare when fully rational consumers can communicate about the quality of goods through word of mouth (Vettas, 1997; Alcalá et al., 2014; Navarro, 2006). While the aforementioned work has considered the effects of given social structures, social network theory