



Social learning and delay in a dynamic model of price competition [☆]

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Abstract

This paper studies dynamic price competition between two firms selling differentiated durable goods to two buyers whose valuations of the two goods depend on their own private type as well as that of the other buyer. We derive a key intertemporal property of the equilibrium prices and construct an equilibrium based on this property. We show that social learning reduces the equilibrium prices in the sense that when the buyers are more interdependent and hence have a stronger incentive to wait and see, the firms respond by lowering their period 1 prices. Interestingly, we find that this response by the firms along with the intertemporal property of the equilibrium prices implies that buyers delay their decisions *less* often when they become more interdependent.

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1. Introduction

Consumer preferences are inherently interdependent in many durable goods markets. Consider, for example, a potential consumer of a new model of an automobile. Purchase decisions of such a product are accompanied by careful examination of various information collected from a catalog and magazine articles as well as their own experience of products from the same manufacturer. Such information forms the basis of the consumer's *intrinsic valuation* of the product. In many cases, however, consumers don't act on their intrinsic valuations alone and are also concerned about how the product is perceived by other consumers. Behind such a concern may be the presence of conspicuous consumption: Consumers attach higher values to the products that are more highly valued by other consumers.¹ Another reason for the concern may be their awareness that their individual piece of information is imperfect: If they can learn others' information about the product, it will help them form a more accurate estimate of its value to them. In either case, in order to understand consumer behavior in the choice of durable goods, it is important to consider their *extrinsic valuations*, which we define to be the combination of the own intrinsic valuations and the valuations of other consumers.

When direct and truthful communication of private information is not feasible, each consumer has an incentive to wait and see the decisions of other consumers to collect more information. We are interested in the problem of intertemporal price competition between two firms selling differentiated durable goods to such interdependent consumers. In our model, two consumers each have private intrinsic valuations about the two goods, and buy a single unit of either good in one of the two periods in an irreversible manner. Hence, a consumer in period 1 must decide between buying today from either firm for the quoted price, and waiting until tomorrow. If he waits, he has better information about his valuation, but the price offer by each firm in period 2 is also contingent on the buyers' decision and can be high or low depending on whether its product was chosen in period 1. Each firm, on the other hand, needs to set its price taking into account the consumers' incentives to 'wait and see' as well as the pricing decision of the other firm. For example, by offering a discount in period 1, a firm may preempt the market by capturing one of the consumers and then be able to sell the good to the other consumer at a higher price in period 2. On the other hand, offering a discount may be detrimental to the profits if, for example, it leads to a more intense competition in period 2. Further, each firm needs to take into account the information flow generated by its pricing decision. This simple discussion already suggests the complexity of the strategic interaction between the consumers, between the firms, and between the firms and the consumers.

A more detailed description of our model is as follows: Two firms *A* and *B* sell differentiated durable goods *A* and *B*, respectively, over two periods. There are two consumers $i = 1, 2$ each of whom has an intrinsic valuation for each one of the two goods. We suppose that for each buyer, the relative superiority of good *B* over good *A* in terms of his intrinsic valuations is randomly drawn and privately observed, but there is no uncertainty about the average valuations of the two

¹ Conspicuous consumption is an important topic in the marketing literature, and is empirically validated by Wilcox et al. (2009), Shukla (2010), and Bian and Forsythe (2012).

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