Can Price Promotions Aid Loyalty?
A Dynamic Structural Model of Search across Stores and across Time

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January 2014

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Abstract

Price dispersion across stores and across time is widespread in many retail settings; in response, consumers can search across stores and across time. Yet the existing literature on structural models of search focuses either on modeling search across stores or across time but not both. This paper introduces a dynamic structural model that nests a finite horizon model of search across stores within an infinite horizon model of search over time. We formulate the dynamic structural model estimation problem as a mathematical program with equilibrium constraints (MPEC), and embed it within an iterative E-M algorithm to estimate latent class heterogeneity. We use data on household choice in the milk category to estimate the model. Omitting the time dimension of search biases the estimated search costs and price elasticity—suggesting the importance of modeling the time dimension in extant structural models of search—especially in the context of frequently purchased consumer goods. Further, the direction of bias is in the opposite direction of what has hitherto been reported in the literature—leading us to the insight that the direction of bias from omitting temporal search is dependent on the relationship between purchase and promotional frequency. Finally, contrary to conventional wisdom that promotions increase cherry picking behavior, we find that in the presence of search costs, price promotions can be a loyalty enhancing device for stores.