

“Spatio-Temporal Analysis of Imitation Behavior Across New Buyers at an Online Grocery Retailer”

Abstract:

For Internet retailers, demand propagation varies not only through time, but also over space. The authors develop a Bayesian spatio-temporal model to study two imitation effects in the evolution of demand at an Internet retailer. Building on previous literature, the authors allow imitation behavior to be reflected both in geographic proximity and in demographic similarity. As these imitation effects can be time-varying, the authors specify their dynamics using a polynomial smoother embedded within our Bayesian framework. The model is applied to new buyers at Netgrocer.com and is calibrated on forty-five months of data that span all 1,459 zip codes in Pennsylvania. The authors find that the proximity effect is especially strong in the early phases of demand evolution, whereas the similarity effect becomes more important with time. Over time, new buyers are increasingly likely to emerge from new zip codes beyond the core set of zip codes that produce the early new buyers, and spatial concentration declines. Managerial implications stemming from the findings are explored through a hypothetical seeding experiment. Other implications for Internet retailing practice are also discussed.