MISQ Archivist

The Demand Effects of Product Recommendation Networks: An Empirical Analysis of Network Diversity and Stability

Zhijie Lin, Khim-Yong Goh, and Cheng-Suang Heng

Abstract

With the increasing popularity of product recommendation networks in e-commerce, researchers and practitioners are eager to understand how they can strategically manage product assortments through the manipulation of such networks to drive demand. We examine product recommendation networks in e-commerce to investigate how the demand of a product influenced by product network attributes in terms of network diversity and network stability. We also examine whether the demand of a product is influenced by both the incoming network and the outgoing network, and if the effects differ between co-view and co-purchase recommendation networks. Using data from Tmall.com for four product categories, we apply linear panel data models to examine the impact of network diversity and network stability on product demand, controlling for relevant factors at the individual product, pricing, product network, product category, and time unit levels. Importantly, we account for implicit demand correlation (i.e., substitution and complementarity) and potential simultaneity of demand and network structures. We unravel several important findings. First, a 1% increase in the category diversity of the incoming (outgoing) co-purchase network of a product is associated with a 0.011% (0.012%) increase (decrease) in the product's demand. Second, a 1% increase in the stability of the outgoing co-purchase network is associated with a 0.012% decrease in demand. Third, the demand effects of network diversity and stability are both stronger in the co-purchase network, compared to their insignificant effects in the co-view network. Thus, this research provides theoretical contributions in terms of the economic effects of product recommendation networks through its focus on network diversity and stability in incoming/outgoing and co-view/co-purchase networks. We also provide notable implications for recommendation-based product marketing and recommendation systems design.

Keywords: Recommendation system, product network, electronic commerce, network diversity, network stability, demand modeling, econometric analysis