



Operations Management under Consumer Choice Models with Multiple Purchases

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摘要: This paper investigates the effects of multiple purchases that arise in the retailing of consumer goods. The product choice and consumer surplus depend not only on what to purchase but also on how many units to purchase. We incorporate the multiple purchases into consumer choice behavior and study a series of associated operations problems. We take the widely-used multinomial logit (MNL) model as a showcase and incorporate the effects of multiple purchases into the classic discrete choice model. In the new choice framework, consumers first form a consideration set, then select one product from consideration set and determine the purchase quantity of the selected product. In the absence of fixed cost, we characterize the structure of the optimal policy for the assortment optimization problem; whereas in the presence of product-differentiated fixed costs, the assortment problem becomes NP-complete, so we propose an efficient heuristic. We further develop a polynomial-time algorithm for the assortment problem with identical fixed cost for each product. For the joint assortment and pricing problem, we show it can be decoupled into multiple pricing problems of different assortment sizes, each of which can be transformed into a single-variable problem.

简介: 薛巍立 东南大学经济管理学院教授、博导, 国家自然科学基金优秀青年科学基金获得者, 中国民主同盟中央青年工作委员会委员, 东南大学“仲英青年学者”; 目前为中国系统工程学会会员, 中国自动化学会经济与管理系统专业委员会会员, 中国管理现代化研究会运作管理专业委员会会员等。主要从事数字经济环境下的运营与决策优化、供应链物流管理、服务运营管理等。发表 SCI/SSCI 论文 40 多篇, 包括 Management Science, Operations Research、Production and Operations Management 以及 Decision Science, Transportation Science 等国际知名期刊; 主持了多项国家自然科学基金等国家级项目。

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