

基于CVaR准则的Newsboy型商品最优广告费用与订货策略

李绩才^{1,2}, 周永务¹, 钟远光¹

1. 华南理工大学 工商管理学院, 广州 510641;

2. 浙江师范大学 行知学院, 金华 321004

Optimal advertisement cost and order policy for Newsboy-type-merchandise under the CVaR criterion

LI Ji-cai^{1,2}, ZHOU Yong-wu¹, ZHONG Yuan-guang¹

1. School of Business Administration, South China University of Technology, Guangzhou 510641, China;

2. Xingzhi College, Zhejiang Normal University, Jinhua 321004, China

- [摘要](#)
- [参考文献](#)
- [相关文章](#)

全文: [PDF \(KB\)](#) [HTML \(KB\)](#) 输出: [BibTeX](#) | [EndNote \(RIS\)](#) [背景资料](#)

摘要 研究了风险厌恶型零售商在面对随机市场需求与广告投入相关时的最优广告投入与订货策略。通过乘法需求形式将广告投入对需求的影响引入Newsboy问题中,并以CVaR作为风险度量准则,建立了风险厌恶型零售商广告投入与订货量联合决策的随机模型;揭示了风险厌恶程度、需求不确定性以及商品本身特性对零售商最优广告投入和订货量的影响;最后通过应用实例对理论结果进行了验证分析。研究结果为零售商制订广告投入策略和相应的订货策略提供了参考。

关键词: Newsboy模型 CVaR 广告费用 订货策略

Abstract: The standard Newsboy problem is based upon risk neutrality with an objective of maximizing expected profit or minimizing expected cost. In this paper, we consider the optimal advertisement cost and order policy under the conditional value-at-risk (CVaR) criterion in a Newsboy model, in which the retailer is risk averse and faces a random demand depending on advertising expenditure. We analyse the effect of risk aversion, the uncertainty in demand, and the merchandise nature on the optimal advertisement investment cost and order quantity decision. And then we illustrate our findings by some numerical examples. These results will be helpful for retailers to make advertisement investment policy, and order policy feasibly and scientifically.

Key words: Newsboy model CVaR (conditional value-at-risk) advertisement cost order policy




收稿日期: 2010-06-21;

基金资助:国家自然科学基金(71131003,70971041);浙江省自然科学基金(Y6110095);广东省自然科学基金(10151064101000003);浙江师范大学青年基金(KJ20100026)

引用本文:

李绩才,周永务,钟远光. 基于CVaR准则的Newsboy型商品最优广告费用与订货策略[J]. 系统工程理论实践, 2012, 32(4): 776-783.

LI Ji-cai,ZHOU Yong-wu,ZHONG Yuan-guang. Optimal advertisement cost and order policy for Newsboy-type-merchandise under the CVaR criterion [J]. Systems Engineering - Theory & Practice, 2012, 32(4): 776-783.

- [1] Porteus E L. Stochastic Inventory Theory[M]// Heyman D P, Sobel M J. Handbooks in OR and MS, Vol. 2. Elsevier Science Publishers B. V., Amsterdam, The Netherlands, 1990: 605-652. 
- [2] Khouja M. The single-period (news-vendor) problem: Literature review and suggestions for future research[J]. Omega, 1999, 27(5): 537-553. 
- [3] Lau A, Lau H. The newsboy problem with price-dependent demand distribution[J]. IIE Transactions, 1988, 20(2): 168-175. 
- [4] Polatolu L. Optimal order quantity and pricing decisions in single-period inventory systems[J]. International Journal of Production

服务

- ▶ [把本文推荐给朋友](#)
- ▶ [加入我的书架](#)
- ▶ [加入引用管理器](#)
- ▶ [E-mail Alert](#)
- ▶ [RSS](#)

作者相关文章

- ▶ [李绩才](#)
- ▶ [周永务](#)
- ▶ [钟远光](#)

- [5] Federgruen A, Heching A. Combined pricing and inventory control under uncertainty[J]. Operations Research, 1999, 47(3): 454-475. 
- [6] Petruzzi N, Dada M. Pricing and the newsvendor problem: A review with extensions[J]. Operations Research, 1999, 47(2): 183-194. 
- [7] Cachon G. Supply chain coordination with contracts[J]. Handbooks in Operations Research and Management Science, 2003(11): 229-340.
- [8] 周永务, 杨善林. Newsboy型商品最优广告费用与订货策略的联合确定[J]. 系统工程理论与实践, 2002, 22(11): 59-63. Zhou Y W, Yang S L. Joint determination of optimal advertisement cost and order policy for newsboy-type-merchandise[J]. Systems Engineering—Theory & Practice, 2002, 22(11): 59-63.
- [9] Khouja M, Robbins S. Linking advertising and quantity decisions in the single-period inventory model[J]. International Journal of Production Economics, 2003, 86(2): 93-105. 
- [10] Wang S D, Zhou Y W. Supply chain coordination models for newsvendor-type products: Considering advertising effect and two production modes[J]. Computers & Industrial Engineering, 2010, 59(2): 220-231. 
- [11] Wang S D, Zhou Y W. Coordinating ordering, pricing and advertising policies for a supply chain with random demand and two production modes[J]. International Journal of Production Economics, 2010, 126(2): 168-180. 
- [12] Lau H. The newsboy problem under alternative optimization objectives[J]. Journal of the Operational Research Society, 1980, 31(6): 525-535.
- [13] Eeckhoudt L, Gollier C, Schlesinger H. The risk-averse (and prudent) newsboy[J]. Management Science, 1995, 41(5): 786-794. 
- [14] Choi T M, Li D, Yan H. Mean-variance analysis of newsvendor problem[J]. IEEE Transactions on Systems, Man, and Cybernetics: Part A, 2008, 38(5): 1169-1180. 
- [15] 杨建奎, 周清, 杨磊. 报童模型的利润与亏损风险平衡分析[J]. 系统工程理论与实践, 2009, 29(3): 100-105. Yang J K, Zhou Q, Yang L. Trade-off analysis of revenue and risk of loss of the newsvendor model[J]. Systems Engineering—Theory & Practice, 2009, 29(3): 100-105.
- [16] Chen X, Sim M, Simchi-Levi, et al. Risk aversion in inventory management[R]. Working Paper in MIT, <https://netfiles.uiuc.edu/xinchen/www/papers/>, 2003: 1-32.
- [17] 许明辉, 于刚, 张汉勤. 带有缺货惩罚的报童模型中的CVaR研究[J]. 系统工程理论与实践, 2006, 26(10): 1-8. Xu M H, Yu G, Zhang H Q. CVaR in a newsvendor model with lost sale penalty cost[J]. Systems Engineering—Theory & Practice, 2006, 26(10): 1-8. 
- [18] Chen Y, Xu M, Zhang Z. A risk-averse newsvendor model under the CVaR criterion[J]. Operations Research, 2009, 57(4): 1040-1044. 
- [19] Rockafellar R T, Uryasev S. Optimization of conditional value-at-risk[J]. Journal of Risk, 2000(2): 21-42. 
- [20] Rockafellar R T, Uryasev S. Conditional value-at-risk for general loss distributions[J]. Journal of Banking and Finance, 2002(26): 1443-1471.
- [1] 冯玲, 欧华宇. 存在相关性风险的资产组合策略[J]. 系统工程理论实践, 2012, (3): 630-639.
- [2] 蒋敏, 方森宇, 孟志青, 夏欢. 供应链多产品产供销风险协调模型[J]. 系统工程理论实践, 2011, 31(7): 1240-1248.
- [3] 林强, 叶飞, 陈晓明. 随机弹性需求条件下基于CVaR与收益共享契约的供应链决策模型[J]. 系统工程理论实践, 2011, 31(12): 2296-2307.
- [4] 唐振鹏; 彭伟. 基于CVaR的RAROC对我国开放式基金绩效评价[J]. 系统工程理论实践, 2010, 30(8): 1403-1413.
- [5] 童小娇; 刘青. 离散界约束分布下的WCVaR风险分析及其应用[J]. 系统工程理论实践, 2010, 30(2): 305-314.
- [6] 刘运辉; 陈剑. 基于逢低买入拍卖的零售商订货策略[J]. 系统工程理论实践, 2009, 29(7): 35-42.
- [7] 李建斌; 张汉勤; 于刚. 带有市场搜索的供应链最优策略的分析与比较[J]. 系统工程理论实践, 2009, 29(10): 53-62.
- [8] 方毅; 张屹山. CVaR在金融工具复制上的应用[J]. 系统工程理论实践, 2004, 24(8): 38-43.
- [9] 侯玉梅. 简单生产-库存系统的优化控制[J]. 系统工程理论实践, 2003, 23(4): 1-6.
- [10] 周永务; 杨善林. Newsboy型商品最优广告费用与订货策略的联合确定[J]. 系统工程理论实践, 2002, 22(11): 59-63.

版权所有 © 2011 《系统工程理论与实践》编辑部

地址：北京中关村东路55号 100190 电话：010-62541828 Email: xtl@chinajournal.net.cn

本系统由北京玛格泰克科技发展有限公司设计开发 技术支持: support@magtech.com.cn