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Opportunity loss minimization and newsvendor behavior. (English) Zbl 1369.90011
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Summary: To study the decision bias in newsvendor behavior, this paper introduces an opportunity loss minimization criterion into the newsvendor model with backordering. We apply the Conditional Value-at-Risk (CVaR) measure to hedge against the potential risks from newsvendor's order decision. We obtain the optimal order quantities for a newsvendor to minimize the expected opportunity loss and CVaR of opportunity loss. It is proven that the newsvendor's optimal order quantity is related to the density function of market demand when the newsvendor exhibits risk-averse preference, which is inconsistent with the results in [*M. E. Schweitzer* and *G. P. Cachon*, *Manage. Sci.* 46, No. 3, 404–420 (2000; [Zbl 1231.90058](#))]. The numerical example shows that the optimal order quantity that minimizes CVaR of opportunity loss is bigger than expected profit maximization (EPM) order quantity for high-profit products and smaller than EPM order quantity for low-profit products, which is different from the experimental results in [*loc. cit.*]. A sensitivity analysis of changing the operation parameters of the two optimal order quantities is discussed. Our results confirm that high return implies high risk, while low risk comes with low return. Based on the results, some managerial insights are suggested for the risk management of the newsvendor model with backordering.

MSC:

[90B05](#) Inventory, storage, reservoirs
[91B06](#) Decision theory

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