Operational Models with Risk Hedging Constraints

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Abstract

We consider the problem of maximizing the profits of a corporation when these profits depend in part on movements in the financial markets and/or economic indices. We propose a methodology for the optimal selection of dynamic operating and financial hedging strategies when the decision maker is risk averse. Risk aversion is imposed through utility functions or constraints on the feasible policies (e.g., VaR, CVaR and budget constraints, among others). We apply our methodology to some standard operations problems including the popular newsvendor model and a supply chain procurement/inventory problem. We also identify circumstances in which the risk management constraints can effectively be ignored when solving for the optimal operating policy. In such cases, operational and financial decisions can be effectively decoupled.

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