

## ■ 연구논문 요약문

논문제목	Distribution-robust single period inventory control problem with multiple unreliable suppliers
게재정보	OR Spectrum, 38 (4), 2016.10.
개요	<ul style="list-style-type: none"> <li>- It is becoming more and more difficult to accurately estimate the distributional characteristics of market demands and suppliers' yields. This situation calls for a way to effectively hedge against risks coming not just from uncertainty itself but also from inaccurate estimation. The main purpose of this paper is to present a distribution-robust (also called a distribution-free) approach to decision-making relating to the design and operation of resilient supply chains. In this approach, instead of specific distributions, only partial information on the distributions is assumed to be known. On that basis, a solution that performs well independent of the particular distributions is sought. Although it seems on the surface to be too conservative, this approach can provide a means of coping with such risks due to inaccurate estimation.</li> <li>- In this paper, we consider a single-period inventory control problem with multiple unreliable suppliers together with stochastic market demand. Minimal information (mean and covariance) on the distributional characteristics of the supply and demand is assumed to be known.</li> </ul>
연구결과	<ul style="list-style-type: none"> <li>- First, we proposed a distribution-robust version of the single-period inventory control problem with multiple unreliable suppliers. Besides providing a way to achieve a solution insensitive to estimation errors, we also show that the distribution-robust approach results in a computationally efficient (convex optimization) model. This can be helpful to the development of solution procedures for extensions including various constraints arising in practice.</li> <li>- Second, we offer some interesting results from application of the proposed model. A generalized version of Scarf's ordering rule is presented that addresses the uncertainty of suppliers' yield as well. Moreover, we provide a full characterization of the optimal sourcing strategies when there are two suppliers one of which is perfectly reliable. Finally, some general guidelines for yield quality improvement, such as supplier diversification and yield variance reduction, are given.</li> </ul>
활용분야 및 기대효과	<ul style="list-style-type: none"> <li>- Multiple unreliable suppliers are considered with an arbitrary form of correlated yields allowed. Since the resulting optimization model is convex, it can be extended to cover various constraints that might occur in practice. For example, the model remains convex even if suppliers' capacity limits as well as budget constraints are included. Therefore, it can serve as a building block for handling more complicated problems related to sourcing decisions.</li> </ul>