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A Robust Optimization Model for Multi-Objective Closed-Loop Supply Chain

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Abstract : In recent years consumers and governments have been pushing companies to design their activities in such a way as to reduce negative environmental impacts by producing renewable product or threat free disposal policy more and more. It is therefore important to focus more accurate to the optimization of various aspect of total supply chain. Modeling a supply chain can be a challenging process due to the fact that there are a large number of factors that need to be considered in the model. The use of multi-objective optimization can lead to overcome those problems since more information is used when designing the model. Uncertainty is inevitable in real world. Considering uncertainty on parameters in addition to use multi-objectives are ways to give more flexibility to the decision making process since the process can take into account much more constraints and requirements. In this paper we demonstrate a stochastic scenario based robust model to cope with uncertainty in a closed-loop multi-objective supply chain. By applying the proposed model in a real world case, the power of proposed model in handling data uncertainty is shown.

Keywords : supply chain management, closed-loop supply chain, multi-objective optimization, goal programming, uncertainty, robust optimization
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