

Abstract

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Multi-Objective Supply Chain Network Design Under Demand Uncertainty Using Robust Goal Programming Approach

Supply Chain Network design involves strategic decisions on the location of production, distribution facilities, capacities and transportation quantities. Supply chains are subjected to different types of Disruptions. In this paper, the disruptions in the demand side are considered. A robust optimization approach is developed for the supply chain network design under demand uncertainty. The supply chain problem considered is a multi-product multi-period multi-echelon. The problem is formulated as a multi-objective model and solved using Goal programming. The objectives are to maximize contribution, minimize the investment and disruptions costs. Installment of production modules incrementally based on the demand at each planning period has significant effect on reducing the total investment of the supply chain and the savings depends on the value of applied interest rate. The results showed that the design vary significantly with demand range of variability. The profit, contribution and total cost are highly sensitive to the ratio between disruption losses and selling price.