

Multi-Period Supply Chain Design under Uncertainty

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Abstract : In this research, a stochastic programming approach is developed for designing supply chains with uncertain parameters. Demands and selling prices of products at markets are considered as the uncertain parameters. The proposed mathematical model will be multi-period two-stage stochastic programming, which takes into account the selection of retailer sites, suppliers, production levels, inventory levels, transportation modes to be used for shipping goods, and shipping quantities among the entities of the supply chain network. The objective function is to maximize the chain's net present value. In order to maximize the chain's NPV, the sum of first-stage investment costs on retailers, and the expected second-stage processing, inventory-holding and transportation costs should be kept as low as possible over multiple periods. The effects of supply uncertainty where suppliers are unreliable will also be investigated on the efficiency of the supply chain.

Keywords : supply chain management, stochastic programming, multiobjective programming, inventory control

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