

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 under uncertainty. Demands, supplies, processing, transportation and shortage costs are all considered as uncertain parameters, and the objective function is to minimize the chain's expected total costs. The effects of supply uncertainty where suppliers are unreliable with random lifetimes will then be investigated on the efficiency of a supply chain, which consists of multi-site retailers and corresponds to a multi-echelon production-distribution network. Locations of retailers are determined at the strategic level, while selection of suppliers, production levels at manufacturing sites, inventory levels at retailers, transportation modes and shipping quantities among the entities of the supply chain network will be determined at the tactical level.