An optimal search algorithm for coordinating production and inventory of a deteriorating item in a supply chain system with a single-vendor and multiple-buyers

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Abstract
In this study, we focus on the optimal coordination of production and inventory of a deteriorating item in a supply chain system with a single-vendor and multiple-buyers so as to minimize the average total costs. In order to solve this problem, we explore the structure of the optimal objective value curve and derive several interesting properties for the mathematical model. By utilizing our theoretical results, we propose a search algorithm that can efficiently solve the optimal solution. Based on our numerical experiments, we show that the proposed algorithm outperforms the existing solution approach in the literature, especially when there are many buyers involved in this supply chain system.

Keywords and phrases: Supply chain, inventory, deterioration, search algorithm, replenishment policy.

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