A new approach in determining lot size in supply chain using game theory

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Abstract

Several seller-buyer supply chain models are suggested which emphasize simultaneously on production and market demand. In these models lot size is obtained based on different approaches. In this paper we present a novel approach to determine lot size in a seller-buyer supply chain. There is an interaction between the seller and the buyer, since the seller prefers large production lot sizes and the buyer likes small ones. Therefore for determining lot size, the seller and buyer’s power is illustrated in the models. We consider two strategies for each situation (Seller-Stackelberg, Buyer-Stackelberg) whether the seller or the buyer as a leader, has more power. The leader can justify or enforce the strategy about the lot size to the follower, or let the follower determine their own lot size. Based on our findings we propose the optimal strategies for each situation. Each strategy’s result will be compared by numerical examples presented. In addition, sensitivity analysis of some key parameters in the models and further research are presented.

Keywords: Supply Chain, Optimal Policy, Order Quantity, Grid Search, Selling Price

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