

A Joint Replenishment Model Under Transportation Batch and Quantity Discounts

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Abstract

Under a global competitive market, improving competitive edges to meet rapidly changing technological innovations and dynamic customer needs is important for firms. How to provide products with a high quality, lower cost at the right time and place is important for manufacturers to maintain a competitive edge and to make a decent profit in a longer term. This paper considers a joint replenishment problem, and the objective is to minimize total costs, where the costs include major and minor ordering cost, purchase cost, holding cost and transportation cost. The joint replenishment problem is first formulated as a mixed integer programming model. Then, an efficient particle swarm optimization model is constructed for solving largescale lot-sizing problems. An illustrative example in a high-tech manufacturer is used to illustrate the practicality of these models for determining the replenishment level from multiple suppliers for multiperiods.

Keyword : Joint replenishment