

**An inventory model for increasing demand with
Probabilistic deterioration, permissible delay and partial backlogging**

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Abstract

In this paper an inventory model for deteriorating items with time dependent quadratic demand and permissible delay in payments is developed. Shortages are allowed and are partially backlogged. An optimal policy that minimizes the total cost is developed. The objectives of this study is to consider three different types of continuous probabilistic deterioration functions and to find the associated total cost. To illustrate the proposed model some numerical examples are given. Sensitivity analysis of the optimal solutions with respect to major parameters are carried out and comparison is made between the three models.

Keywords: Inventory, Quadratic demand, Permissible delay in payments, Probabilistic deterioration, Partial Backlogging