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Computational procedure of optimal inventory model involving controllable backorder rate and variable lead time with defective units

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Abstract

This article considers that the number of defective units in an arrival order is a binominal random variable. We derive a modified mixture inventory model with backorders and lost sales, in which the order quantity and lead time are decision variables. In our studies, we also assume that the backorder rate is dependent on the length of lead time through the amount of shortages and let the backorder rate be a control variable. In addition, we assume that the lead time demand follows a mixture of normal distributions, and then relax the assumption about the form of the mixture of distribution functions of the lead time demand and apply the minimax distribution free procedure to solve the problem. Furthermore, we develop an algorithm procedure to

obtain the optimal ordering strategy for each case. Finally, three numerical examples are also given to illustrate the results.

Keywords:

defective units | order quantity | backorder rate | minimax distribution-free procedure | mixtures of distribution

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