

A Queueing Inventory with Reduction in Sale Price with Aging

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Abstract:

Consider an inventoried item for which reduction in sales price is declared as the age of the item increases. Decision to maintain sales price at the same level/reduce, is taken at stages $2, \dots, k-1, k$. On the items attaining CLT, they are sold at scrap value, provided items are still left in stock. The problem is modelled as a queueing-inventory problem which is a continuous time Markov chain (CTMC). Customer arrival forms a non-homogenous Poisson process, with rate increasing with each sales price reduction. Service time follows exponential distribution. The items are replenished according to (S, s) policy with positive lead time. Each stage of CLT is iid which follows a Phase type distribution with representation (α, S) of order m . The k -fold convolution of this distribution is the CLT of the inventoried items. The stationary distribution of this CTMC is computed and various performance measures are discussed. A cost function is constructed to compute the optimal order quantity and reorder level.

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