

OPTIMAL INVENTORY POLICIES WITH EXPONENTIAL DEMAND RATE AND A CASH DISCOUNT UNDER TRADE CREDIT DEPENDING ON ORDER QUANTITY

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ABSTRACT

This study develops an EOQ (economic order quantity) model for cash discount optimal inventory policies where demand rate is exponential and deterioration rate is zero. In this model the seller proposes a fixed trade credit M_1 or M_2 and sales revenue generated during the credit period. During the credit period, the retailer can earn more by selling products. In this model, the seller must be paid for the item as soon as the customer receives them during cash discount and delay in payment. Some of the item may exponentially time dependent in the course of time. In this regard, the author develops an EOQ model for exponential time dependent demand rate. The mathematical model is developed by considering seven different cases for finding total relevant cost. The total relevant cost of the model is minimized. Taylor's series expansion (for first order approximation as well as second order approximation) is applied for finding closed form solution. Furthermore, five different results have been discussed. Finally numerical examples provide the solution procedure to obtain optimal cycle time and optimal total relevant cost.

KEYWORDS: Cash Discount, Order Quantity, Inventory, Trade Credit