



International Journal of Mathematical, Engineering and Management Sciences  
Vol. 3, No. 3, 245–257, 2018  
<https://dx.doi.org/10.33889/IJMEMS.2018.3.3-017>

## Inventory Policies for Price-Sensitive Stock-Dependent Demand and Quantity Discounts

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(Received June 16, 2017; Accepted August 4, 2017)

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### Abstract

It was usually observed in typical EOQ inventory models that the holding cost, the purchasing cost and the demand rate are constant and the purchasing cost is irrespective of the order size. But practically, the demand rate is based on various factors including sale price, seasonality and availability. Due to the lengthening of shortage periods, the holding cost per unit item increases. Also with the inclusion of quantity discounts, the unit purchasing cost is usually decreased for higher order sizes. This article addresses jointly with the inconsistency of the rate of demand, unit purchasing cost and unit holding cost for deteriorating items. This paper proposes a model based on an inventory problem including selling price of products and stock-dependent market demand rate, holding cost based on storage time and purchasing cost is influenced by order size by offering all units quantity discounts. An algorithm for estimating the optimum solution of decision variables by maximizing total profit and minimizing the overall cost of the model is developed in this paper. Validation of the developed model is confirmed with the help of a numerical example along with the sensitivity-analysis of decision variables by varying various inventory parameters.

**Keywords** - Deteriorating items, Quantity discounts, Price-sensitive stock-dependent demand rate, Storage-time dependent holding cost, Order- size dependent purchasing cost.