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Optimal pricing and lot-sizing for perishable inventory with price and time dependent ramp-type demand. (English) [Zbl 1309.91061](#)

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Summary: Product perishability is an important aspect of inventory control. To minimise the effect of deterioration, retailers in supermarkets, departmental store managers, etc. always want higher inventory depletion rate. In this article, we propose a dynamic pre- and post-deterioration cumulative discount policy to enhance inventory depletion rate resulting low volume of deterioration cost, holding cost and hence higher profit. It is assumed that demand is a price and time dependent ramp-type function and the product starts to deteriorate after certain amount of time. Unlike the conventional inventory models with pricing strategies, which are restricted to a fixed number of price changes and to a fixed cycle length, we allow the number of price changes before as well as after the start of deterioration and the replenishment cycle length to be the decision variables. Before start of deterioration, discounts on unit selling price are provided cumulatively in successive pricing cycles. After the start of deterioration, discounts on reduced unit selling price are also provided in a cumulative way. A mathematical model is developed and the existence of the optimal solution is verified. A numerical example is presented, which indicates that under the cumulative effect of price discounting, dynamic pricing policy outperforms static pricing strategy. Sensitivity analysis of the model is carried out.

MSC:

91B24 Microeconomic theory (price theory and economic markets)

90B05 Inventory, storage, reservoirs

Cited in **5** Documents

Keywords:

inventory; price and time dependent ramp-type demand; discount; deterioration

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