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Economic production quantity models for deteriorating items with price- and stock-dependent demand

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Abstract

Large piles of consumer goods displayed in a supermarket are often associated with on sale items to induce more sales and profits. In this paper, we first establish an economic production quantity (or EPQ) model for deteriorating items when the demand rate depends not only the on-display stock level but also the selling price per unit. In addition, we impose a ceiling on the number of on-display stocks because too much stock leaves a negative impression on the buyer and the amount of shelf/display space is limited. We then provide the necessary conditions to determine an optimal solution that maximizes profits for the EPQ model. Finally, sensitivity analysis is applied on the parameter effects of the optimal price and production run time.



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Keywords

Inventory control; Lot sizing; Pricing; Stock-dependent demand; Deterioration

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