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## A pricing and inventory control for perishable items with the inflation rate and retailer's returns

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**Abstract:** The impact of inflation and retail returns on perishable item joint pricing and inventory control is explored in this research, and a new model is given. The model is tested using a price and time-dependent demand function, as well as retailer's returns as a function of the selling price and order volume. The major aims of the study are to determine the optimal selling price, replenishment cycles, and order quantity all simultaneously; and to maximise the present value of the total profit over a given time horizon. Furthermore, it is displayed that the optimal replenishment cycle is unique at any price. It is then illustrated that the present value of the total profit is a concave function of price with an optimal value. Also, a simple algorithm was described for determining the optimal solution and model variables. Finally, a numerical example is used to indicate the solution algorithm, and the model's effectiveness is demonstrated by sensitivity analysis.

**Keywords:** pricing; inventory control; simultaneous pricing and inventory control; perishable; retailer; inflation; retailer's returns; time value of money; TVM; Iran.

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**Biographical notes:** Fateme Kharidar received her MSc in Industrial Management from the Ferdowsi University of Mashhad. She is a researcher in Industrial Management-Operations Research. Her research interest includes supply chain management, inventory control, operational research, and optimisation. Also, her other interests include organisational behaviour, coaching and leadership.

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