An inventory model for single - vendor multi - retailer supply chain under inflationary conditions and trade credit

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ABSTRACT

This paper presents an inventory model under inflation for deteriorating items in a single-vendor multi-retailer supply chain. The demand is a function of the retail price. The vendor offers the retailers trade credit. Two scenarios; (i) the changes in the inflation rate as a Discrete-Time Markov Chain and (ii) the changes in the inflation rate without considering Markovian conditions are considered. The relationship between the vendor and the retailers is modeled as a Stackelberg – game (the vendor is the leader and retailers are the followers). The retail price, the number of replenishment cycle, the production rate of vendor and the replenishment frequency of the raw material are obtained by maximizing the present value of the total profit for the vendor and the retailers. The results reveal that in the scenario (i), the present value of the total profits for the vendor and the retailers is greater compared to scenario (ii).

KEYWORDS: Trade credit, supply chain, stackelberg game, discrete-Time, markov chain, deteriorating items