Channel Coordination for a Deteriorating Product with Time-varying Demand and Production rate

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Abstract:

The paper develops a two-echelon supply chain model with a single-retailer and a single-manufacturer. The manufacturer's production rate is assumed to be dependent on the retailer's demand rate which is a linear function of time. The manufacturer's production process is not perfectly reliable. During a production run, it may shift from an in-control state to an out-of-control state at any random time when some defective items are produced. The retailer's inventory is deteriorated at a constant rate over time. Assuming that the manufacturer follows a lot-for-lot policy for replenishment made to the retailer, the average total cost of the supply chain is derived and an algorithm for finding the optimal solution is developed. For a numerical example, the coordination policy of the supply chain is illustrated and the sensitivity of model parameters is examined.

Keywords:

Supply chain; time-varying demand; deterioration; process shift.

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