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Optimal production and distribution policies for a two-stage supply chain with imperfect items and price- and advertisement-sensitive demand: A note

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Abstract

This paper develops inventory models of a vendor-buyer supply chain with imperfect products and shortages based on Rad et al. [M.A. Rad, F. Khoshalhan, C. H. Glock, Optimizing inventory and sales decisions in a two-stage supply chain with imperfect production and backorders. *Comput. Ind. Eng.* 74 (2014) 219-227] and assumes that both the selling price and advertisements influence the market demand. For this reason, the buyer mandates an advertising company for promoting the product. The objective of the paper is to determine pricing, advertising, lot-sizing, backordering, and shipment policies under independent and joint optimization. Numerical examples and a sensitivity analysis illustrate the proposed models. The results indicate that coordination becomes more and more advantageous for the supply chain as the sensitivity of demand to price or advertisements increases. Furthermore, as the uncertainty in item quality increases, the buyer reduces the demand to better match demand and supply.

Keywords: inventory, pricing, advertising, imperfect quality, backordering, supply chain

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