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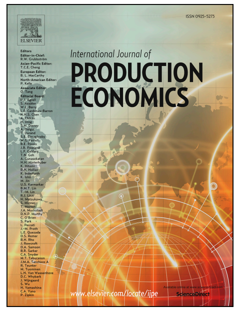

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Pricing and lot-sizing policies for perishable products with advance-cash-credit payments by a discounted cash-flow analysis

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Abstract

A contractor often requests a customer pay an advance payment when signing a contract to install a new roof. A cash payment to cover the contractor's materials cost is then required upon delivery of the materials to do the job. Then, the contractor grants the customer a credit payment to pay the remainder of the total cost after the work is completed and satisfactory. Hence, an advance-cash-credit (ACC) payment scheme is commonly used in real world business transactions. This paper develops a supplier-retailer-customer chain in which the retailer receives an upstream ACC payment from the supplier while in return offers a down-stream cash-credit (some in cash and the rest in credit) payment to customers. Additionally, today's health-conscious consumers judge product freshness through its expiration date because the freshness of a perishable product degrades with time. As a result, the demand for perishable products is influenced by the combined effect of selling price and product freshness linked to expiration date. Taking time value of money into consideration, then an inventory model by using a discounted cash-flow analysis is developed. Furthermore, the present value of total annual profit is demonstrated that is strictly concave in unit price and strictly pseudo-concave in replenishment time, which simplifies the search for the global solution to a local maximum. Finally, a sensitivity analysis is conducted and several managerial insights are obtained.

Keywords: Supply chain; Pricing; Expiration date; Perishable products; Advance-cash-credit payment.

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