INVENTORY MANAGEMENT IN A MANUFACTURING-REMANUFACTURING SYSTEM WITH STOCHASTIC RETURNS

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Abstract
The design of a remanufacturing system that recovers sold products is needed to meet environmental objectives. However, to establish closed-loop supply chains for sustainability, it is necessary to consider not only environmental factors but also economic efficiency. By selling remanufactured products with prices lower than new products, market sizes may be expanded and firms may accrue higher profits. However, a cannibalization effect in which consumers who would have purchased new products instead purchase remanufactured products at lower prices can occur. The purpose of this study is to design a manufacturing-remanufacturing system to propose an optimal production planning and inventory control policy in consideration of the cannibalization effect. First, a time series model for the demand is constructed. Next, the economic efficiency and environmental impact of the system are evaluated by simulation experiments.