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Revenue and promotional cost-sharing contract versus two-part tariff contract in coordinating sustainable supply chain systems with deteriorating items

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Title: Revenue and promotional cost-sharing contract versus two-part tariff contract in coordinating sustainable supply chain systems with deteriorating items

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Abstract

This paper studies a two-echelon sustainable supply chain system with deteriorating items consisting of one manufacturer and one retailer under carbon cap-and-trade regulation. The time-varying demand in this system is affected by three endogenous variables that include promotional effort provided by the retailer, product selling price, and the sustainable level determined by the manufacturer. A centralized model and a decentralized model are first formulated and compared. The results show that cooperation between the manufacturer and retailer may lead to higher profit and lower carbon emissions. We then propose a revenue and promotional cost-sharing contract and a two-part tariff contract to coordinate this system. A numerical example and sensitivity analysis with several key parameters are presented to illustrate the effectiveness of the contracts. The results show that both contracts can lead to perfect coordination, while the two-part tariff contract is more robust than the revenue and promotional cost-sharing contract.

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