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SUPPLY CHAIN EMISSION REDUCTION OPTIMIZATION UNDER CONSUMER CARBON SENSITIVITY AND CARBON TAX POLICY

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Abstract

This paper presents decentralized and centralized decision-making conditions based on consumer carbon sensitivity and carbon tax policy in a supplier-driven two echelons supply chain. The analysis shows that: 1) the optimal emission reduction amount under centralized decision-making is more than that under decentralized decision-making; 2) the carbon tax should be levied properly because the carbon emission reduction will decrease as the carbon tax is higher than a critical value; 3) the consumer carbon sensitivity is positively correlated with carbon emission reduction, but it may cause total mission rised in certain condition. Then an extensive numerical analysis is conducted to enrich the discussion and to draw some managerial insights on how to reduce carbon emission in the supply chain.

Key words: carbon emission reduction, consumer carbon sensitivity, carbon tax policy, Stackelberg game, supply chain

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