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# The manufacturer's joint decisions of channel selections and carbon emission reductions under the cap-and-trade regulation

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## ABSTRACT

Environmental pollution has become a major threat to the survival and health of human beings, and has attracted the worldwide attention. With the implementation of low-carbon policies, how to change marketing strategy is a realistic and serious problem of enterprises. This paper examines the manufacturer's channel selection and emission reduction decisions when considering carbon emission constraints. A two-echelon supply chain consisting of one manufacturer and one retailer under the cap-and-trade regulation is explored. Non-perishable products' and perishable products' carbon emissions are distinguished according to their sales channels. The results provide useful insights for supply chain members. Firstly, the results show that products' properties and consumers' channel preference are key factors affecting manufacturer's channel selection. When consumers prefer online shopping, the manufacturer, who produces perishable/non-perishable products, should choose single online channel structure to maximize his profit. But, this choice cannot make as same contributions to the environment if the manufacturer produces perishable product as that under retail channel. Secondly, the results demonstrated that under cap-and-trade regulation, the channel conflict appears to have abated somewhat. The retailer can accommodate the additional online channel under certain conditions. Additionally, numerical results further illustrate the following insights from the perspective of the government: It is more effective to set larger carbon quotas and encourage the manufacturer to develop a dual-channel mode when not too many consumers prefer to online channel. With more and more consumers preferring to online shopping, it can formulate more stringent emission control.

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