

Supply Chain Coordination under Carbon Trading Mechanism in Case of Conflict

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Abstract : This paper investigates the coordination of the conflicting two-stage low carbon supply chain consisting of upstream and downstream manufacturers. The conflict means that the upstream manufacturer takes action for carbon emissions reduction under carbon trading mechanism while the downstream manufacturer's production cost rises. It assumes for the Stackelberg game that the upstream manufacturer plays as a leader and the downstream manufacturer does as a follower. Four kinds of the situation of decentralized decision making, centralized decision-making, the production cost sharing contract and the carbon emissions reduction revenue sharing contract under decentralized decision making are considered. The backward induction approach is adopted to solve the game. The results show that the more intense the conflict is, the lower the efficiency of carbon emissions reduction and the higher the retail price is. The optimal investment of the decentralized supply chain under the two contracts is unchanged and still lower than that of the centralized supply chain. Both the production cost sharing contract and the carbon emissions reduction revenue sharing contract cannot coordinate the supply chain, because that the sharing cost or carbon emissions reduction sharing revenue will transfer through the wholesale price mechanism. As a result, it requires more complicated contract forms to coordinate such a supply chain.

Keywords : cap-and-trade mechanism, carbon emissions reduction, conflict, supply chain coordination

Conference Title : ICEFM 2016 : International Conference on Economics, Finance and Marketing

Conference Location : Miami, United States

Conference Dates : December 05-06, 2016