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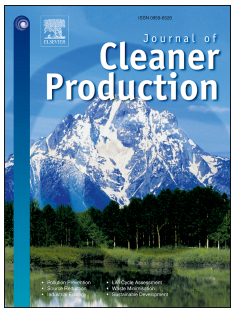

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Deyan Yang, Tiaojun Xiao

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Pricing and green level decisions of a green supply chain with governmental interventions under fuzzy uncertainties

Deyan Yang [a], Tiaojun Xiao [a, b, *]

[a] School of Management Science and Engineering, Nanjing University, Nanjing 210093 China;

[b] Institute of Game Behavior and Operations Management, Nanjing University of Finance and Economics, Nanjing 210046 China

ABSTRACT

Environmental issues make green manufacturing become inevitable and fuzzy uncertainty prevails in supply chain management. In order to further promote the development of green supply chain, according to channel leadership scenario, we develop three game models of a green supply chain with governmental interventions under fuzzy uncertainties of both manufacturing cost and consumer demand. We study how prices, green levels and expected profits are influenced by channel leadership and governmental interventions. Green level sensitivity and fuzzy degree of parameters are considered. Analytical results indicate that manufacturer Stackelberg scenario is the inferior structure than other scenarios and retailer Stackelberg scenario is superior to other scenarios for all players under the strong governmental interventions. Then, when governmental interventions increase, the green level will increase, but the tendency of retail price depends on channel leadership. Governmental interventions are not always beneficial to the green supply chain and the manufacturer. Further, although the government's subsidy is offered to the manufacturer, the retailer benefits from it ultimately and further becomes the main puller of the development of green products. In addition, a relatively high green level floor for subsidy results in the manufacturer's first-mover disadvantage.

***Keywords*:** Green supply chain; Governmental intervention; Channel leadership; Fuzzy uncertainties; Game theory

[*] Corresponding author. Tel: +86 25 83686733

E-mail addresses: yangdeyan027@foxmail.com (D. Yang), xiaotj@nju.edu.cn (T. Xiao).