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Supply chain game analysis based on mean-variance and price risk aversion under different power structures

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ABSTRACT

In view of the random retail price and retailer's preference for retail price risk aversion, we used mean-variance to describe the uncertainty risk of retail price. To study the impacts of both the retail price uncertainty risk and retail price risk aversion preference on supply chain (SC) decision-making, we constructed a SC game model based on three different power structures, including Manufacturer Stackelberg (MS) game, Retailer Stackelberg (RS) game, and Vertical Nash (VN) game. The results showed that the retail price uncertainty risk and the retailer's retail price risk aversion preference weakened the manufacturer's production effort input, decreased the retailer's enthusiasm for ordering, and damaged the interests of manufacturer and retailer. Under the three different power structures, the production effort input of the manufacturer depended on the production effort affecting wholesale price efficiency and retail price efficiency. The retailer's expected utility was largest under the MS game model and smallest under the VN game model. The manufacturer's profits were closely related to each parameter under the three respective power structures. This study provides theoretical guidance for the decision-making of SC enterprises with retail price risk and retailer with retail price risk aversion preference under different power structure situations.

ARTICLE INFO

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