Decision-making strategies in supply chain management with a waste-averse and stockout-averse manufacturer

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ABSTRACT

Behavioral preferences is an important factor that affects the decision-making strategies of enterprises. Usually, the behavioral preferences will lead to decision-making that deviates from profit maximization. In this study, we investigate the influence of a dominant manufacturer’s behavioral preferences on decision-making and subsequent impact on profits. This study looks at the profits of the manufacturer, retailer and the system as a whole. We construct a two-stage supply chain involving a retailer and a manufacturer who may have risk-neutral (𝑅𝑅), stockout-aversion (𝑆𝑆), waste-aversion (𝑊𝑊), and stockout- and waste-aversion (𝑆𝑆𝑊𝑊) preferences. Through a comparison and analysis of the four cases, we find that the manufacturer’s wholesale price increases (decreases) with the 𝑆𝑆 coefficient, while the retailer’s order quantity is completely the opposite. The manufacturer’s wholesale price is the highest in the 𝑊𝑊 model, followed by the 𝑅𝑅, 𝑆𝑆 and 𝑊𝑊 models, in that order. The retailer’s order quantity is the largest and smallest in the 𝑆𝑆 and 𝑊𝑊 models, respectively, while the size of the order quantity between the 𝑅𝑅 and 𝑊𝑊 models depends on the ratio 𝑚 (the ratio of the 𝑆𝑆 to the 𝑊𝑊). Moreover, we also explore the changing trends of the decision-making and profits of the participants and the system profit with the degree of 𝑆𝑆 and 𝑊𝑊, comparing the profits of the four cases.

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