Supply chain coordination based on the probability optimization of target profit

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ABSTRACT

Supply chain management decision-making study mainly based on the expected utility theory and most of the studies are obtaining the average values in the statistical sense. For Supply Chain (SC) decision-making individuals the statistical-based optimal profitability brings decision conflicts in the particular market within a specific period. Moreover, the small and medium outsourcing participants face unexpected outcomes which are the main cause of SCs disruption. This study proposes a contractual coordination model that maximizes the probability of a pre-determined Profit Target (PT). The purpose of this paper is to reduce the influence of demand uncertainty with the high risk of unexpected outcomes. We constructed the Revenue Sharing (RS) and buyback contract models within the SC participants' PT conditions and then discussed the SC overall performance. We simulated and analyzed the coordination conditions and the decision-making preferences of SC participants under the two contracts. From the comparison, under the PT strategy, the retailer is more willing to adopt the RS contract rather than the buyback contract. But the SC upstream supplier's contract selection decision depends on the specific contract parameters. Finally, numerical results indicated the contract selection decisions with the given PT of both SC participants.

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