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Agent-based simulation of competitive performance for supply chains based on combined contracts

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Abstract

To investigate the competitive performance of supply chains in the real world, this paper presents a multi-agent model of four three-level supply chains that apply different types of combined contracts by taking into account the effects of vertical and horizontal competition between supply chains. We considered four experimental scenarios, such as no change in the market, a change in consumer price preferences, a change in service preferences and demand uncertainty. We then analyzed the impact that coordinating the combined contracts had on the competitive performance of four supply chains and the relevant members in each scenario, which was based on the results of agent-based simulation. The simulation results indicate that the combined contracts have no significant impact on the overall profits or profit stability of the supply chains with coordination, but different coordination mechanisms have different impacts on the profits and profit stability. The aim of this paper is to provide suggestions to choose the appropriate types of combined contracts for multi-level supply-chains and their members under a complex market environment.

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