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Production disruption, compensation, and transshipment policies

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Abstract:

Firms can mitigate the effects of production disruptions by compensating customers for delayed delivery and sharing the redundant capacity from other firms through transshipment. In this study, we provide a framework to jointly optimize these two strategies in a dynamic setting, and in particular we examine how a manufacturer under capacity disruption can reduce loss through employing dynamic strategies over a horizon with T periods. We consider a decentralized lateral system with one disrupted manufacturer and one requested manufacturer. In each period during the disruption, both manufacturers decide whether to transship. We characterize the structure of the optimal transshipment prices and compensation policies for both independent and competitive market scenarios. Based on the equilibrium of the game, we propose the optimal dynamic transshipment decision policies. In the computational experiments, we find that the transshipment conditions under the competitive scenario are less strict than those under the independent scenario.

Key words: disruption, compensation rate, transshipment policy, redundant capacity, capacity sharing

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