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Supply Chain Coordination with Trade Credit and Quantity Discount Incorporating Default Risk

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Abstract

We explore the issue of supply chain coordination by considering trade credit and its risk. It shows that, in a retailer-manufacturer system, the manufacturer may deliver less than the retailer's order quantity when the payment is delayed, and the manufacturer's risk aversion makes this result hold in a wider range. These findings are different from the common sense believed in the retailer-manufacturer coordination literature, which suggests the manufacturer to entice the retailer to enlarge the lot size. The manufacturer's decision of decreasing the order quantity prevents the supply chain from operating in the optimal situation. In order to coordinate supply chain, we propose a modified quantity discount based on both order quantity and advance payment which means the manufacturer offers quantity discount if the retailer pays part of the payment in advance and enlarges her order quantity. The ranges of advance payment ratio and the quantity discount are derived. Numerical examples are used to demonstrate the conclusions.

Keywords

Newsvendor; Trade credit; Credit risk; Advance payment; Mean-variance model

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