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Buyer–vendor coordination for fixed lifetime product with quantity discount under finite production rate

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Abstract

Buyer–vendor coordination has been widely addressed; however, the fixed lifetime of the product is seldom considered. In this paper, we study the coordination of an integrated production-inventory system with quantity discount for a fixed lifetime product under finite production rate and deterministic demand. We first derive the buyer's ordering policy and the vendor's production batch size in decentralised and centralised systems. We then compare the two systems and show the non-coordination of the ordering policies and the production batch sizes. To improve the supply chain efficiency, we propose quantity discount contract and prove that the contract can coordinate the buyer–vendor supply chain. Finally, we present analytically tractable solutions and give a numerical example to illustrate the benefits of the proposed quantity discount strategy.

Keywords:

buyer–vendor coordination | quantity discount | perishable products | limited lifetime | finite production rate

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Additional information

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