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

Qinghong Zhang , Jianwen Luo & Yongrui Duan
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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.

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#### Notes on contributors

## Qinghong Zhang

Qinhong Zhang received his PhD degree from School of Management, Shanghai Jiao Tong University, PR China. He is an assistant professor in Sino-US Global Logistics Institute, Shanghai Jiao Tong University. His research interests include supply chain management, reverse logistics, and interface between operations management and finance. His publications have appeared in Operations Research Letters, International Journal of Production Research, Asian Pacific Journal of Operational Research, etc.

Jianwen Luo

Jianwen Luo received his PhD degree from Zhejiang University, PR China. He is a professor in School of management, Shanghai Jiao Tong University. His research interests include supply chain finance, procurement management, etc. His publications have appeared in Operations Research, Journal of the Operational Research Society, International Journal of Production Economics, Operations Research Letters, Supply Chain Management: An International Journal, Asia-Pacific Journal of Operational Research, etc.

#### Yongrui Duan

Yongrui Duan received her PhD degree from School of Management, Shanghai Jiao Tong University. She is a professor at Tong Ji University, PR China. Her research interests include supply chain management, service operations management, optimisation, etc. She has published several papers in International Journal of Production Economics, Computer and Mathematics with Application, Journal of Mathematical Analysis and Application, and others.

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