









422 19
Views CrossRef citations to date Altmetric
Original Articles

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

Qinghong Zhang ✓, Jianwen Luo & Yongrui Duan
Pages 821-834 | Received 10 Sep 2013, Accepted 14 Mar 2014, Published online: 14 Apr 2014

66 Cite this article ✓ https://doi.org/10.1080/00207721.2014.906684

Sample our



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.

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

## Acknowledgements

The authors are grateful to the editor, associate editor, and the two anonymous referees for their valuable comments and suggestions.

# Additional information

# Funding

Keywords:

This work is supported by National Science Foundation of China [grant number 71001063], [grant number 71372107], [grant number 71002020], [grant number 71072063].

### 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.

#### Related Research Data

Blood platelet production: Optimization by dynamic programming and simulation

Source: Computers & Operations Research

A perishable inventory model with positive order lead times

Source: European Journal of Operational Research

COORDINATION OF A BUYER-VENDOR SUPPLY CHAIN FOR A PERISHABLE PRODUCT

UNDER SYMMETRIC AND ASYMMETRIC INFORMATION

Source: Asia Pacific Journal of Operational Research

Supply chain coordination for short-life-cycle products with option contract and partial backorders

Dackorders

Source: European J of Industrial Engineering

An optimal procurement policy for items with an inventory level-dependent demand rate and fixed lifetime

rate and fixed inclinic

Source: European Journal of Operational Research

## (S - 1, S) Policies for Perishable Inventory

Source: Management Science

## Related research 1

i research

People also read

Recommended articles

Cited by

A production inventory model for vendor-buyer coordination with quantity discount, backordering and rework for fixed life time products >

#### P. Muniappan et al.

Journal of Industrial and Production Engineering

Published online: 19 Aug 2015

Information for

**Authors** 

**R&D** professionals

**Editors** 

Librarians

**Societies** 

Opportunities

Reprints and e-prints

Advertising solutions

Accelerated publication

Corporate access solutions

Open access

Overview

Open journals

**Open Select** 

**Dove Medical Press** 

F1000Research

Help and information

Help and contact

Newsroom

All journals

Books

#### Keep up to date

Register to receive personalised research and resources by email



Sign me up











Accessibility



Copyright © 2025 Informa UK Limited Privacy policy Cookies Terms & conditions



Registered in England & Wales No. 01072954 5 Howick Place | London | SW1P 1WG