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PII: S0305-0548(16)30257-X
DOI: http://dx.doi.org/10.1016/j.cor.2016.10.009
Reference: CAOR4107

To appear in: *Computers and Operation Research*

Received date: 25 December 2015
Revised date: 29 July 2016
Accepted date: 22 October 2016

Cite this article as: Jafar Heydari, Payam Zaabi-Ahmadi and Tsan-Ming Choi Coordinating Supply Chains with Stochastic Demand by Crashing Lead Times *Computers and Operation Research,* http://dx.doi.org/10.1016/j.cor.2016.10.00

Coordinating Supply Chains with Stochastic Demand by Crashing Lead Times[1]

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Paper prepared for *Computers and Operations Research*'s Special Issue on *Advances in Stochastic Programming and Robust Optimization for Supply Chain Planning*

First version: 25 December 2015; revised: 28 July 2016.

Abstract

In this paper, a method to coordinate a seller-buyer supply chain (SC) system by means of controlling the lead time (LT) with the consideration of different shipping modes is proposed. To be specific, two shipping modes (one fast and one slow) are considered in the proposed model. Through spending more and using a fast shipping mode, the seller can reduce LT. The cost of LT crashing is modeled as a fixed-charge step function in which a slow shipping mode can only reduce LT to a certain level and crashing LT beyond this level needs to replace the current shipping mode with a fast shipping mode. In this model, through controlling LT as an incentive mechanism, the seller motivates the buyer to participate in the joint decision making. The conditions for both members under which they are convinced to participate in the joint decision making plan are derived. The results show that more spending and, under certain circumstances, using the fast shipping mode can provide sufficient motivation for the buyer to coordinate the order quantity and the service level (SL) decisions in the supply chain simultaneously. Numerical

[1] We sincerely thank the editors and the anonymous reviewers for their kind and helpful comments on this paper.