

The Hong Kong Polytechnic University
Department of Logistics and Maritime Studies
Research Seminar

Sourcing from Multiple Unreliable Suppliers for Price-Dependent Demands

by

Ruixia Shi
Ph.D Candidate
University of Texas, Dallas

Date: 13 January 2009 (Tuesday)

Time: 10:30am - 11:30am

Venue: M714, Li Ka Shing Tower

The Hong Kong Polytechnic University

(Conducted in English)

Abstract:

We consider a firm that replenishes a certain product from multiple suppliers with random capacities for price-dependent demands over multiple periods. In each period, the firm needs to decide the set of suppliers to order from, the amount of orders, and the price of the product based on the current inventory level. The major difficulty with this problem is that the profit function is not concave in each of the orders to the suppliers. By examining the effect of capacity uncertainty, we prove the concavity of the optimal profit function in the inventory level under fairly general conditions. For the special case of deterministic capacities, we derive an optimal multi-level modified base-stock list-price policy. We show that this policy can be computed as if only a single decision variable is involved. In general, the presence of capacity uncertainty leads to a nonlinear inventory-dependent pricing and replenishment policy. On the other hand, the price-dependent demand uncertainty results in non-monotone ordering quantities in the inventory level. We characterize the conditions under which both the optimal number of suppliers to be retained and the optimal price are nonincreasing in the inventory level. Under the same conditions, there is a unique re-order point for each supplier such that an order is placed if and only if the inventory level is below this point.

Bio:

Ruixia Shi is a Ph. D. candidate in Operations Management at The University of Texas at Dallas. Her research interests include supply chain management, Operations-Marketing interface and partially observed inventory models. Before entering The University of Texas at Dallas, she received her degree of B. Eng in Industrial Management Engineering from Shanghai Jiao Tong University.

Please email to lgtnlam@inet.polyu.edu.hk for enquiries.

~All are welcome!~