

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

Supply Diversification under Price Dependent Demand and Random Yield

by

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**Date: 30 March 2016 (Wednesday)
Time: 11:30am - 12:30pm
Venue: R402, Shirley Chan Building
The Hong Kong Polytechnic University**

(Conducted in English)

Abstract:

Supply diversification and pricing are two common mechanisms for dealing with supply yield uncertainty. This paper studies the interplay of the two mechanisms when both mechanisms are employed by a firm that faces production yield uncertainty. We compare the optimal sourcing decisions under two distinct pricing schemes: (1) ex ante pricing - the firm simultaneously makes the sale price and sourcing decisions before production takes place; (2) responsive pricing - the pricing decision is postponed until after the production yield realization. Although the firm is better off with responsive pricing, the impact of pricing on the optimal sourcing quantity and the firm's need for supply diversification is less clear and is dependent on factors such as unit procurement cost, supply portfolio, and supply reliability. For the case of one unreliable supplier, we show that responsive pricing mitigates the overage and underage risk imposed by yield uncertainty, and when the procurement cost is low (high), results in a lower (higher) optimal order quantity than that under ex ante pricing. For the case of one unreliable and one reliable supplier, we find that an ex ante pricing firm finds no value in supply diversification, but responsive pricing gives rise to the need for supply diversification. For the case of two unreliable suppliers, we prove that responsive pricing promotes (discourages) supply diversification when the supply reliability is low (high). But when the supply reliability is moderate, responsive pricing promotes (discourage) supply diversification when the unit procurement cost is low (high). Finally, we demonstrate that when facing highly correlated yields, the firm ranks reliability higher than cost in supplier selection, i.e., it may skip the cheaper supplier to select the expensive supplier if the latter is more reliable.

This is a joint work with Prof. Lingxiu Dong and Prof. Nan Yang.

Bio:

Guang Xiao received his Bachelor Degrees (2008) in both Applied Math and Philosophy from Peking University, and Master Degree (2010) in Operations Research from University of Delaware. Currently, he is a Ph.D. candidate in Operations Management at the Olin Business School, Washington University in St. Louis. His research interests include the modeling and analysis of important issues in supply chain/operations management, with a primary focus on supply chain risk management. He is also interested in pricing and inventory management, sourcing and procurement, sustainable/socially responsible operations, as well as their applications in addressing real world problems. His work has been published in *Manufacturing and Service Operations Management*.

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All are welcome!