

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

## **Posted Pricing versus Bargaining in Sequential Selling Process**

by

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(joint work with Prof. J. George Shanthikumar)

**Date: 29 May 2017 (Monday)**  
**Time: 10:30am-11:30am**  
**Venue: R902, Shirley Chan Building**  
**The Hong Kong Polytechnic University**

**(Conducted in English)**

### **Abstract:**

We study the role of bargaining in a firm's revenue management. The seller firm under consideration sequentially sells a fixed amount of stock to a random arrival stream of potential buyers over a finite selling season. The buyers are heterogeneous in their valuation of the product. Based on the stock level and the time to the end of the selling season, the seller may dynamically choose either to post a take-it-or-leave-it price or to engage in bargaining with an arriving buyer. A unique feature of our model is the linkage between the seller's disagreement point from a trade and her future value of the product, which differentiates our study from previous ones on revenue management with bargaining, as well as imposing analytical challenges. We introduce a stochastic order, called *scaled pricing order*, for the buyer's valuation distribution. The scaled pricing order measures the average portion of trade surplus that the seller can obtain by posting a price. We characterize the family of distributions that are invariant in the scaled pricing order, which includes uniform and exponential distributions. When the buyer's valuation distribution belongs to the invariant family, the seller should stick to either pricing or bargaining throughout the selling season, depending on her bargaining power vis-à-vis the buyer. When the buyer's valuation is increasing (decreasing) in the scaled pricing order, the seller should choose pricing (bargaining) at the beginning of the selling season and switch to bargaining (pricing) toward the end. We also discuss several variations of our model by including transaction-based bargaining cost, commission-based bargaining cost and a mixed buyer population with bargainers and non-bargainers. In contrast to what is uncovered in previous studies, our findings suggest that the seller choice of the selling mechanism is highly sensitive to the distributional properties of the buyer's valuation, highlighting the importance of appropriately modeling the seller's disagreement point in a *sequential* trading process.

### **Bio:**

Qi Annabelle Feng is the John and Donna Krenicki Chair Professor in Operations Management at Krannert School of Management, Purdue University. She was previously a faculty member at McCombs School of Business, The University of Texas at Austin. She received her Ph.D. in Operations Management from UT Dallas in 2006. Her main research interest lies in studying firms' sourcing decisions in the broad context of supply chain management. Her work focuses on individual firm's procurement planning in uncertain environment and multiple firms' interactions in sourcing relationships. She also works in the areas of product development and proliferation management, resource planning, economic growth models, and information system management. She is currently a Department Editor for Production and Operations Management. She received the first prize in the INFORMS Junior Faculty Paper Competition in 2009, Franz Edelman Award in 2009 and the Wickham Skinner Early-Career Research Accomplishment Award in 2012.

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**All are welcome!**