

# The Hong Kong University of Science and Technology

Dept of Information Systems, Business Statistics  
and Operations Management  
Dept of Industrial Engineering & Logistics Management  
Joint Seminar Announcement

## Drug Distribution through Pharmacy Benefit Manager (PBM) in Pharmaceutical Supply Chain: Formulary Design and Drug Pricing

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City University of Hong Kong

**Date** : 27 November 2015 (Friday)  
**Time** : 11:00 - 12:15 pm  
**Venue** : Room 2001, LSK Business Building



**Abstract:** We model the competition among multiple Pharmacy Benefit Managers (PBMs) for the patronage of a client organization. Each PBM selects a list of prices to be charged to the client organization for each of the branded and generic drugs within a therapeutical class (price decision) and a formulary list that assigns branded drugs to preferred or non-preferred tiers (formulary decision). Drug manufacturers offer rebates to PBMs for drugs on preferred tier of formularies. The individuals participating in the client's pharmacy benefit plan are the ones consuming the drugs and making purchasing decisions, while the client organization is paying the majority of drug cost. The choices of the individuals and the client organization are governed by different utility measures. For this complex drug distribution setting and for competing PBMs, we show the existence and uniqueness of a pure Nash equilibrium on aggregate formulary and price decisions, which represent the welfare-adjusted cost and welfare-adjusted price of each PBM's plan respectively. We characterize each PBM's optimal formulary and equilibrium price decisions, and discuss the impact of various model primitives. We apply our model to gain insights on the impact of mergers in the PBM industry.

**Bio:** Yixuan Xiao is an assistant professor at City University of Hong Kong. She obtained her PhD from Washington University in St. Louis and BS from Peking University. Her research focuses on operations management, pharmaceutical supply chain, revenue management, risk management, interface of operations and marketing.