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Speaker: Professor Hui Zhao, Smeal College of Business, Penn State University

Date: Friday, October 11, 2013

Time: 10:30 – 11:45 am

Location: Room 1505

Title: Mitigating US Drug Shortage: Contract Design and Operational Strategies

Abstract: Drug shortage has been one of the most challenging problems facing the US pharmaceutical industry in recent years. Although the problem has drawn tremendous attention with a great number of reports and articles on its causes, limited academic literature has analyzed the problem rigorously, nor is there any proposed solution based on rigorous research. Further, much discussion is on economic reasons, but little is said from a supply chain’s perspective, which we believe to be one of the keys to the problem. In this paper, we model the pharma supply chain with several levels of decisions related to the shortage problem: (1) price and failure-to-supply contract between drug manufacturers and buyers; (2) capacity adjustment by drug manufacturers; and (3) production/inventory decisions at drug manufacturers. Our model captures key characteristics of drug shortage including capacity-related disruptions, uncertain recovery time from disruptions, weak failure-to-supply clauses, and a combination of backorder and lost sales. Based on the model, we investigate the reasons for shortage, derive the optimal decisions for drug manufacturers, and propose Pareto improving contracts that ensure drug manufacturers’ profit, mitigate drug shortage, and cut/maintain government spending since many of the drugs on shortage are covered under Medicare Part B. Such contracts feature strengthened failure-to-supply clauses and increased prices. We test our proposal with realistic industry data to show the impact of the proposal on different parties. We believe our analytical and numerical analyses provide useful insights into drug shortage mitigation in the US pharmaceutical industry.

Bio: Dr. Hui Zhao’s research interests include collaboration in decentralized supply chains, information asymmetry and information sharing, and healthcare operations with particular interests in pharmaceutical supply chains. Most of her current work is in the area of pharmaceutical supply chains including pharmaceutical distribution strategy and contracting, pharmaceutical capacity planning and outsourcing, drug shortage, among other things. Hui’s research has appeared in journals such as Management Science, Operations Research, Manufacturing and Service Operations Management, Naval Research Logistics, IIE Transactions on Healthcare Systems Engineering, and
Interfaces. One of her recent publications on the impact of overbooking was selected as a featured article for IE magazine. Prior to joining the faculty of Smeal, Hui has been on faculty at Krannert School of Management at Purdue University for a number of years. She has worked with the Technical Assistance Program of Purdue University, Caterpillar, Proctor and Gamble, and top pharmaceutical distributors. Hui’s teaching interests include business analytics, supply chain management, and healthcare/pharmaceutical supply chains. Hui has received distinguished MBA teaching awards at Krannert. She is a member of INFORMS, MSOM, and POMS.