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Stock-Outs and Customer Purchasing Behavior when Product Quality is Uncertain*

by

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3:15 p.m. — Refreshments before the seminar
3:30 p.m. — Graduate Seminar

ABSTRACT — In this paper, we study how stock-outs influence consumer-purchasing behavior for new or innovative products with unknown quality. Stock-outs can contain information about the propensity of other consumers to purchase the product. For consumers that are imperfectly informed about the product quality, a stock-out may convince them to buy. Even though a stock-out may generate the 'buzz' that the product quality is high, increasing the consumer's willingness to buy, stock-outs lead to lost sales. Hence, creating buzz through stock-outs is tricky. We analyze a model in which potential consumers observe privately a noisy signal of the product quality as well as the number of retailers that is out of stock within a set of retailers from which he can buy. We study how the number of observed stock-outs impacts the consumer purchasing behavior and the realized sales. We show how asymmetric inventory allocation to ex ante identical retailers may increase the expected satisfied demand compared to symmetric inventory allocation: When the retailer with lower inventory stocks out, the other retailer does not only take the base demand of the out of stock retailer, but, also takes the extra demand triggered by the stock-out. We show that taking strategic consumer reactions to stock-outs into account may lead to the counter-intuitive phenomenon. Finally, we discuss the managerial implications of taking strategic consumer purchasing behavior into account.

**Joint work with Garrett van Ryzin*

BIO — Laurens Debo studies operations management with a special interest in the economics-operations interface, queuing games, and global supply chain management. Before joining the Chicago Booth faculty in 2008, he was an assistant professor of operations management and manufacturing at the Tepper School of Business at Carnegie Mellon University. Debo's published works include "Market Segmentation and Technology Selection for Remanufacturable Products" and "Queuing for Expert Services" in *Management Science* and "Life Cycle Dynamics for Portfolios with Remanufactured Products" in *Production and Operations Management*. He has also made presentations at several MSOM conferences, the California Institute of Technology, Columbia University, Washington University, and several INFORMS conferences. Debo earned a master's-level degree in 1994 from Katholieke Universiteit Leuven in Belgium. In 1995, he graduated with a master's-level degree in operations management from the Universite Catholique de Louvain. He earned a master's degree in management from INSEAD in Fontainebleau, France, in 2000 and a PhD in 2002 with a dissertation entitled, "Topics in Remanufacturing, Repair and Disposal."

Host: Prof. Saif Benjaafar