

The Hong Kong University of Science and Technology

Department of Information Systems,  
Business Statistics and Operations Management

Seminar Announcement

***Warranty Costs Sharing in a Supply Chain***

by

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*Columbia Business School*

**Date: Friday, 11 November 2011**  
**Time: 1:45 pm – 2:45 pm**  
**Venue: Conference Room 2397**  
**(near Dept of Finance, L17/18)**

~~~~~ All interested are welcome ~~~~~

**Abstract:** We consider a supply chain where a buyer (manufacturer) sources a component from multiple suppliers. The buyer uses the component to make a product that she sells to end customers. When the component fails in the field, warranty costs are incurred. We are interested in understanding how the way the warranty expenses are shared among the buyer and the suppliers impacts supply chain decisions and profits. In particular, two sharing rules are considered. One is the Equal Sharing Rule (ESR), whereby the buyer pays for a fixed percentage of the total warranty expenses with the remainder equally shared by the suppliers. The other is the Target Sharing Rule (TSR), whereby the buyer still pays for a fixed percentage of the total warranty costs but the rest of the warranty expenses are charged back to the originating suppliers of the defective components. The suppliers each exert efforts to improve the quality of their product. Such efforts not only reduce the total warranty costs but also generate larger market shares for the effort-exerting suppliers. Therefore, the suppliers are engaged in a multi-person game where each supplier independently chooses his quality-improvement effort. Based on the equilibrium outcomes of the suppliers' game under both sharing rules, we provide conditions under which the buyer prefers one sharing rule over another. We also show how the comparison between the sharing rules changes if the buyer can set the wholesale price to maximize her own profits. Finally, we compare the performance of the decentralized supply chain with the centralized scenario and provide conditions for supply chain coordination through proper warranty costs sharing and wholesale pricing. Numerical examples are used to illustrate various sensitivity analyses.

**Bio:** Fangruo Chen is the MUTB Professor of International Business at the Graduate School of Business, Columbia University.

Professor Chen's main research area is operations strategy and supply chain management. He has published extensively in the field's top academic journals such as "Management Science," "Operations Research," and "Manufacturing & Service Operations Management." His research addresses a broad spectrum of strategic issues such as strategic alignment, capacity planning, demand forecasting, procurement/supplier management, production/service system designs, quality management, information technology, green manufacturing, corporate social responsibilities, etc.

Professor Chen received the prestigious CAREER Award from the National Science Foundation (USA), 1997. In 2004, he received the Distinguished Overseas Young Investigator Award from the National Natural Science Foundation of China. In 2005, he was appointed the Distinguished Visiting Professor by the Chinese Academy of Sciences. In 2006, he was named the Chang Jiang Scholar by the Ministry of Education, China.

Professor Chen held, and continues to hold, numerous leadership positions in his profession: Area Editor for "Operations Research" (responsible for the Manufacturing, Service, and Supply Chain Operations area), Departmental Editor for "Management Science" (Supply Chain Management Department), Senior Editor for "Manufacturing & Service Operations Management," and Editorial Board Member of "Marketing Science." In 2006, he served as the President of the Manufacturing & Service Operations Management (MSOM) Society in the U.S. In 2007, he founded the Overseas Chinese Scholars Association in Management Science and Engineering (OCSAMSE). He is the current President of OCSAMSE. In 2009, he spearheaded the launching of the China Business Initiative (CBI) of the Chazen Institute of International Business at Columbia Business School, and is the current director of the initiative.

Professor Chen holds a B.S. in Engineering from Shanghai Jiao Tong University in China, an M.S. in Systems Engineering from the University of Pennsylvania's School of Engineering and Applied Sciences, and an A.M. in Managerial Economics and Social Sciences and a Ph. D. in Operations Management from the University of Pennsylvania's Wharton School.