

Department of Systems Engineering and Engineering Management

Seminar Series

Manufacturer Competition Using Supply Functions in a Retail Supply Chain

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Date: 13 March 2019 (Wednesday)

Time: 2:30pm-3:30pm

Venue: P7303, Yeung Kin Man Academic Building (YEUNG), City University of Hong Kong

Abstract

This paper studies contract design between a retailer and two competing suppliers who each supply one of two substitutable products to the retailer for sales in a consumer market. We consider a setting in which the same contracts are used in each period of a planning horizon. The advantage of this contract is that the suppliers and the retailer do not need to sign new contracts for each order in the planning horizon, which is time consuming and costly. We first show that it is optimal for each manufacturer to offer a cost-plus contract. This result allows us to characterize an equilibrium in which the retailer's choice maximizes the supply chain profit, each manufacturer makes a profit equal to its marginal contribution to the supply chain, and the retailer takes the remaining profit. In addition, the optimal ordering policy of the retailer can be characterized by separate regions that exhibit monotone properties. We extend our baseline model to cases with more than two manufacturers, and show that the optimal supply chain profit as a set function of manufacturer indices is submodular. Using this submodularity property, we demonstrate that the equilibrium results for the two-manufacturer case continue to hold.

About the Speaker

Dr Houyuan Jiang is University Reader (Associate Professor) in Management Science at Judge Business School, University of Cambridge. He teaches courses related to quantitative techniques, business analytics, mathematical modelling, and operations management.

His current research interests include healthcare operations, supply chain management and revenue management, for which he builds mathematical models, uncovers managerial insights, and develops computational methods. Previously, Dr Jiang was a Senior Research Scientist at the Commonwealth Scientific & Industrial Research Organizations (CSIRO) in Australia, where he undertook research in combinatorial optimization and consultancy in applied operations research and management science.

He is a member of the Institute of Operations Research and Management Science (INFORMS). He has published in Management Science, Manufacturing and Service Operations Management, Operations Research, Production and Operations Management and a number of leading optimization journals. He has been or was an editorial board member of Computational Management Science, International Journal of Revenue Management, Numerical Algebra, Control and Optimization, Operations Research Letters, and Production and Operations Management.

All are Welcome!