

The Hong Kong University of Science and Technology

Department of Information Systems, Business Statistics and Operations Management
Department of Industrial Engineering and Decision Analytics

Joint Seminar Announcement



Government Policies to Incentivize Citizen Preparedness for Supply Disruptions by

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Date : **Friday, 10 March 2023**
Time : **10:30 am - 11:45 am**
Venue : **Room G001, LSK Business Building**



Abstract:

The public often suffers from significant losses due to inadequate preparation in the face of risks of supply disruptions. This paper uses a dynamic model to study government financial intervention in preparing the public for emergencies. In particular, we consider a continuous time Markov chain model to capture the responses of the retailer and citizens, and to investigate government policies to incentivize the society to get supplies in advance to reduce social loss upon disruption risks. We first analyze three kinds of government policies: 1) subsidies for retailer's capacity cost, 2) rebates for retailer's capacity idle time, and 3) coupons to reduce citizens' purchase cost, where the first two policies work on the retailer while the last works on citizens. We show that the government may apply the budget towards incentivizing the retailer or citizens depending on the status quo. Most importantly, we introduce a mixed policy where part of the budget can provide coupons for citizens to purchase supply, and the remainder can provide subsidies to the retailer for capacity at the same time. Minimizing the social loss under the mixed policy is a technically non-tractable problem, and we present an algorithm which computes a budget allocation where the resulting loss is at most $(1 + \epsilon)$ -times of the minimum social loss. We conduct numerical experiments to study the performance of the mixed policy. We show that a mixed policy can increase the reduction of social loss under a single policy by as much as 46%.

(Joint work with Xiaoyan Zhao and Venus Lo)

Bio:

Stephen Shum is Professor and Associate Dean (Research and Faculty) at the College of Business in the City University of Hong Kong. He received PhD Degree in Operations Research from MIT, and bachelor degrees in Electrical Engineering and Mathematics from UCLA. His research focuses on pricing and revenue management, supply chain management, and customer behavior in operations management. He is an Associate Editor for Naval Research Logistics and Journal of the Operations Research Society. Prior to joining the City University of Hong Kong, he was on the faculty of HKUST Business School.