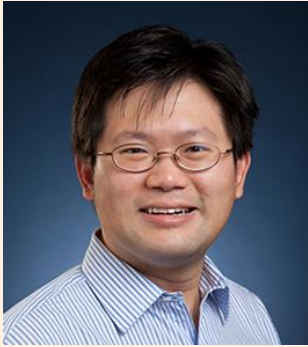


# The Hong Kong University of Science and Technology

Dept of Information Systems, Business Statistics and Operations Management

Dept of Industrial Engineering & Decision Analytics

Joint Seminar Announcement



## Revenue Management Meets Inventory Management

by

**Prof. Stefanus JASIN**

**University of Michigan**

**Date** : **31 January 2024 (Wednesday)**  
**Time** : **10:30 – 11:45 AM**  
**Venue** : **3/F Classroom 2 (3003)**



**Abstract:** In this talk, I will discuss some recent works at the intersection of Revenue Management and Inventory Management. The first part of the talk will focus on the paper "Joint Inventory and Pricing for a One-Warehouse Multi-Store Problem: Spiraling Phenomena, Near Optimal Policies, and the Value of Dynamic Pricing." In the paper, we consider a joint inventory and pricing problem with one warehouse and multiple stores, in which the retailer needs to make a one-time decision on the amount of inventory to be placed at the warehouse at the beginning of the selling season, followed by periodic joint replenishment and pricing decisions for each store throughout the season. This is a practically relevant yet technically challenging problem. Motivated by much recent works in the Revenue Management literature, we study the performance of policies based on the solution of a deterministic/fluid relaxation of the original stochastic problem. To the best of our knowledge, this relaxation is also commonly used in industrial practice, especially for complex inventory allocation decisions. Our contributions are three-fold. We first show that simple re-optimization of deterministic/fluid problems may yield a very poor performance by causing a "spiraling down" movement in price trajectory, which in turn yields a "spiraling up" movement in expected lost sales quantity (i.e., lost sales quantity keeps going up as we continue re-optimizing the model). This cautions against a naive use of simple re-optimizations in the joint inventory and pricing setting with lost sales. Second, we propose a better policy by combining four ideas: (1) order-up-to control, (2) linear rate adjustment, (3) replenishment batching, and (4) random errors averaging. We show for a particular choice of control parameters that the proposed policy performs close to optimal when demand is Poisson and the annual market size for each store is large. Third, we show that the benefit of dynamic pricing cannot be recovered by simply implementing a combination of fixed (potentially non-stationary) pricing policy with a smarter (more sophisticated) replenishment policy, which underscores the importance of dynamic pricing. For the second part of the talk (i.e., given enough time), I will briefly discuss other recent works on related topics.

**Bio:** Prof. Stefanus Jasin is an Associate Professor of Technology and Operations at Stephen M. Ross Business School, University of Michigan. His research focuses on developing tools/algorithms for predictive and prescriptive analytics, with recent applications in pricing and revenue management, assortment optimization, supply chain management, e-commerce/omni-channel logistics, and online learning. optimization. His works in collaboration with several students and co-authors have been acknowledged by several awards, including 2023 Finalist in POMS-HK Student Paper Competition, 2022 Winner of EURO Pricing and Revenue Management Student Award, 2022 Second Prize in POMS-HK Student Paper Competition, 2019 Finalist in POMS-JD.com Best Paper Competition, 2018 Finalist in MSOM Student Paper Competition, 2018 Finalist in IBM Best Student Award Competition, 2018 Winner of INFORMS Revenue Management and Pricing Section Prize Award, 2017 Winner of INFORMS eBusiness Best Paper Award, and 2017 Second Prize in POMS-HK Student Paper Competition. He is currently serving as the Department Editor for Revenue Management and Market Analytics department at POMS. He is also an Associate Editor at Management Science, Operations Research, Manufacturing and Service Operations Management, and Naval Research Logistics.

All interested are welcome!

Enquiries: Dept of ISOM