



SCHOOL OF BUSINESS

IIM SEMINAR

A Risk Analytics Approach to Production Planning

Speaker:

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Abstract:

We study production planning integrated with risk hedging to minimize certain specific risk measures such as shortfall. In addition to the one-time production quantity decision, there is a real-time hedging strategy throughout the horizon; and the goal is to minimize the gap between a pre-specified target and the total terminal wealth achieved by both production and hedging. To this end, we model demand as a stochastic process with two random components: in addition to the usual Gaussian component to capture forecast noise, the demand rate takes the form of a function of an asset price (itself being another stochastic process). We do not assume any specific form of this rate function, allowing it to be machine-learned from demand and asset price data. Using a duality based method, we derive the optimal hedging strategy, which can be expressed as a portfolio of two options, a digital option and a put option. With the hedging strategy optimized, we show that optimizing production quantity is a convex minimization problem. With both production and hedging optimized, we provide a complete characterization of the efficient frontier: the minimized shortfall as an increasing function of the target. Other model features include partial information and a budget constraint, both are motivated by practical implementations. A brief overview of two other related projects in risk/business analytics will also be highlighted.

Date:	March 23, 2017 (Thursday)
Time:	2:30 p.m. — 4:00 p.m.
Language:	English
Venue:	KK1301, 13/F., K.K. Leung Building, The University of Hong Kong

All Interested are Welcome