

The Hong Kong University of Science and Technology
Department of Information Systems,
Business Statistics and Operations Management

Seminar Announcement

*Price Dispersion in Electricity Auctions:
Strategic Analysis and Economic Implications*

by

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Date: 23 October 2008 (Thursday)

Time: 10:30 am – 12:00 noon

Venue: Room 4379, ISOM Conference Room (L17/18)

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

**Abstract:** The paper was motivated by the high price volatility in wholesale electricity markets and an ongoing debate about market design. Two interrelated questions are examined: (a) the effect of suppliers' capacity on their bidding decisions in unit-price procurement auctions; and (b) performance comparison between a uniform auction (charging all suppliers a uniform market clearing price) and a discriminatory auction (charging each supplier a price equal to her/his bid).

We show that, in the absence of exogenous sources of uncertainty such as asymmetric information and random demand, price may not be constant and price dispersion may stem endogenously from electricity producers' randomized bidding due to the prevalence of a mixed strategy equilibrium. The bid distribution and consequent price variance are mainly determined by system utilization and capacity asymmetry among suppliers. Introduction of demand uncertainty increases the likelihood of price dispersion, but not necessarily the magnitude of price variability. Numerical studies further illustrate that demand uncertainty has a secondary contribution to price dispersion, compared with system utilization. Based on the model of conditional price dispersion that we propose, the empirical study on the New England Power Pool qualitatively supports our theoretical predictions.

In contrast to the two schools of auction theorists who argue one auction's efficiency superiority over the other, our paper suggests that the two auctions have the same efficiency but the discriminatory auction is favored by risk averse electricity procurers. These insights are also of practical value for the procurement and outsourcing managers in other industries who face competitive suppliers with capacity constraints.

**Biography:** Roman Kapuscinski is an Associate Professor of Operations and Management Science at the Ross School of Business at the University of Michigan and Business School Co-director of Tauber Institute for Global Operations.

Roman's research includes topics such as the value of information in coordinating the elements of supply chains, optimal design of production-inventory systems with capacity constraints, efficiency as a function of ownership within value chain analysis, and lead-time quotation. Recently his work extends also to pricing in energy markets and operations-marketing interface.

He is an Associate Editor for Management Science, Operations Research, and Manufacturing and Service Operations Management. Five papers written by him and his students were finalists/winners of MSOM student paper competitions and one a winner of ENRE student competition. He has cooperated in research with several companies, including advising over 50 MBA/Engineering projects.

Roman holds an undergraduate degree in Mathematics and Economics from Nicholas Copernicus University and Masters and PhD degrees in Operations Management from Carnegie Mellon University.