

The Hong Kong University of Science and Technology

Department of Information Systems,  
Business Statistics and Operations Management

School of Humanities & Social Science/  
Division of Social Science

Joint Seminar Announcement

## ***Bounded Rationality: Theory, Experiment and Practice***

by

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**Date: Friday, 23 September 2011**

**Time: 11:00 am – 12:00 noon**

**Venue: Room 2404 (Lift 17/18)**

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

**Abstract:** Behavioral research in operations management has become an increasingly active area in recent years. Before the advent of behavioral research, operations were studied mainly through applied mathematics and game theory for understanding decision-making of self-interested agents. Research has shown that human decisions can deviate significantly, in a case by case basis, from theoretical predictions. This talk discusses a study which illustrates how traditional theory can be augmented with assumptions of bounded rationality and become more successful in explaining decision-making behavior. Secondly, we will discuss an application of behavioral research in an industrial setting.

First, we study, in a two-tier supply chain, how the optimal contract, with respect to both the contract form and contract parameters, changes if the downstream retailer is bounded rational, and anchor his decisions on a reference point. This descriptive decision model is based upon empirical evidence from human experiments, which we conducted under four types of commonly used supply chain contracts. We observed that decision makers are heterogeneous, in the sense that behavioral tendencies vary in a wide range across individuals. Given a subject, however, behaviors are consistent over time in spite of some learning effects. Applying our model to contract design, we found that the coordinating contracts behave differently than what the normative theory predicts. Furthermore, our numerical analysis showed that contract parameters from optimization are sensitive to individual behavioral differences. Thus, this study establishes, for contract design, the importance and possibility to calibrate empirical retailers using historical data.

Secondly, we discuss an example application, developed inside Hewlett-Packard, of how behavioral model can be applied to a work force management problem. In particular, one important piece of information, to resource management in the consulting business, is the probability of winning of the deals being pursued. Inside HP, sales managers are required to estimate a "win" probability for each deal. We constructed a behavioral model to explain how sales managers are forming these estimates. Sale managers are found to be bounded rational, prone to positive biases but nevertheless informative. The model is also used to "adjust" the reports. The adjustment cuts down the error rate by half while increasing information revelation by 20%.

**Bio:** Kay-Yut Chen is a principal scientist at Hewlett-Packard Laboratories. He started behavioral economics research at HP Labs, a first in a corporation, after he received his Ph.D. from Caltech in 1994. Kay-Yut is one of the first researchers to apply behavioral economics to business issues in areas such as supply chain contracting and human-based forecasting. Kay-Yut's work have been featured in many popular publications such as Scientific American (2006), Newsweek (2003), the Wall Street Journal (2000), Financial Times (2002) and others. He is the author of the book, The Secrets of the MoneyLab, published by Portfolio in Oct 2010.