

Department of Information and Systems Management
School of Business and Management
The Hong Kong University of Science and Technology

Seminar Announcement

*Going Beyond Expected Profit Maximization in
Supply Chain Management*

by

Dr Chen Kay-Yut

*Principal Scientist
Information Services & Process Innovation Lab
Hewlett-Packard Company*

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Time : 11:00 – 12:30 pm

Venue : Room 4379 (L17/18)

ISMT Conference Room

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

**Abstract**

Behavior research in supply chain operations has become an increasingly active area in recent years. Before the advent of behavior research, supply chain operations were studied mainly through applied mathematics and game theory for understanding strategic interactions between self-interested agents. Research has shown that human decisions can deviate significantly, in a case by case basis, from theoretical predictions. This talk discusses three different studies which illustrate how traditional theory has different degrees of success in explaining decision-making behavior and how it breaks down in different contexts.

First, we consider a manufacturer's problem of managing his direct online channel alongside a traditional brick-and-mortar retail channel, when the channels compete in service. We identified theoretical equilibrium strategies for the manufacturer and the retailer. Then, we conducted experiments with human subjects to study whether the expected utility maximization based model is consistent with behavior. We show that the model can predict the direction of strategic shifts when parameters of the environment change and that risk aversion can explain quantitatively the differences between theory and observations.

Second, we examine the problem of a supplier soliciting forecast from a manufacturer where the manufacturer has private information about future demand, and he has a strong incentive to exaggerate. Standard theory predicts that simply asking for a forecast will result in a unique "babbling equilibrium" in which no information will be exchanged. However, laboratory experiment revealed that asking for a forecast works better than predicted. We propose a new behavioral model to explain this phenomenon.

Third, we study human decisions in a dynamic setting. In the traditional dynamic control theory, decision-makers are assumed to make no errors: optimizing their expected payoffs considering the full time horizon. We used a sequence of experiments, with human subjects, to determine how individuals make pricing and/or ordering decisions for one single product over a finite number of periods. The demand of the product is uncertain and its mean is a function of the period price. We found that participants were worse off when they were asked to make both the pricing and the ordering decision, than just one of the two decisions (with the other fixed) in the dynamic environment. This is contrary to the simple mathematical principle which dictates that more degrees of freedom never reduce performance. We have developed a behavioral model, based on the quantal response framework, to explain the observations.

Companies are starting to capitalize on the potential of experimental behavioral research. Hewlett-Packard (HP) has been using economics experiments to make major supply chain contracting decisions since 1999. Based on the experimental results, HP changed its policies for its North America consumer business. For example, it made the consequences for minimum advertisement price violations forward-looking as well as backward-looking as part of the standard contract for retailers like Best Buy.