OMS 899: INTERFACES OF OPERATIONS AND FINANCE (FALL 2007)

Time: Fridays 8:30-11:30am (Thur. 9/13, 1:30-4:30pm, Thur. 10/18, 2:30-5:30pm)
Location: See detailed schedule

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Office Hours: By appointment

COURSE DESCRIPTION

Operations management is the backbone of financial performance, and financial markets provide opportunities of better risk management. The objective of this Ph.D. seminar is to broaden your knowledge in both operations and finance, and to study business problems using an integrated approach. In the first part of this course, we study the basic theory of production with financial hedging and speculation. The second part of the course focuses on a series of topics in operations management with the presence of financial markets. These include inventory management, valuing real options, commodity procurement and trading, global risk-management in manufacturing, etc. The last part of the course reviews the positive research (as opposed to normative research as in the first two parts) in explaining and modeling the inventory and price dynamics.

The course material consists of published research articles and working papers. The format of the course is a hybrid of my lectures, your presentations, and our discussions. Previous exposure to microeconomics, probability theory, stochastic dynamic programming is recommended.

COURSE ACTIVITIES

Presentations
Studying and presenting a research paper is an effective way to learn some of the topics in this course, and may be a great way to get started on a research topic. A research paper will be presented by two students. Two students are expected to help with each other to achieve their best understanding of the paper and prepare for a 40–45 minutes presentation. A presentation session typically lasts for 1 hour, and contains the motivation or the background for the research topic, details of the main results, including an adequate level of mathematical details, a critical assessment of the paper’s contributions, and possibly some suggestions for related work or research questions. You are very much encouraged to study the impact of the paper by reading other research papers that have cited the paper. Web of Science® is a useful citation database.

You are expected to present 4–5 papers, depending on the final class size. You may select papers from the tentative course schedule below, or choose a paper of your own interest, subject to my agreement. Your paper presentation should be mainly in the form of PowerPoint slides and
prepared transparencies (the latter might be convenient for writing mathematical details). Please provide the class with hard copies of your transparencies or slides. The class discussion may elicit more thoughts on the paper. Please summarize these thoughts and insights in bullet format, revise the slides if necessary, and then submit to me within one week after the presentation.

Class Participation
Learning will be enhanced if well-prepared individuals contribute. Thus, you are expected to read the papers before class, even if you are not presenting. The implicit assumption is that we all have something to contribute to the collective learning experience each day, and we all want to benefit from it. Coming prepared will maximize the benefits for everyone. Class participation will be evaluated based on your comments and contributions to class discussions.

Homework
One effective way of learning some of the materials in this course is by practice. Homework sets will include numerical problems that directly apply some concepts and methods learned in class and more open-ended questions to elicit thoughts and insights.

The current plan is to have a total of 5 homework sets. The average of your best 4 homework marks will be used as your homework grade. On each homework paper, please note the hours spent doing the assignment. (I use these times to estimate the workload as the course progresses.) Homework is due at 8:30am, the start of the class period. Part of the homework may be discussed at the beginning of the class. As a result, late homework will not be accepted.

Term paper
The goal of the term paper is to review a research area of your interest, and get started on a research topic. A term paper consists of an original and critical survey of the existing literature on a topic of interest to you, and discussion on unsolved and interesting research questions, possibly arising from practical experience. Modeling and analysis are not required. Please submit to me, by Friday Nov. 9, a one-page term paper proposal, which contains a description of a research topic and a list of important papers to be reviewed. The term paper is due on Dec. 18.

A term paper is typically 1.5 or double spaced, 11 pt font, and 10-15 pages. Academic Honor Code applies. The code and related procedures can be found at the following website: http://www.bus.umich.edu/Academics/Resources/communityvalues.htm.

**GRADING**
- Presentations 40%
- Homework 20%
- Term paper 20%
- Class participation 20%

**LEARNING TO KNOW YOU**
At the beginning of the second class (Thursday Sep. 13), please hand in a short summary with: your name, contact information, the program and specialization you are currently enrolled in, why you are taking this course, any prior exposure or related practical experience, and a picture if you wish. I use this to know you, to contact you if needed. I also keep these in case I am asked in the future to provide a recommendation for you.
SELECTED PAPERS FOR SEMINAR DISCUSSION

* indicates papers to be presented by the instructor, ** indicates papers to be presented by students. △ indicates introductory materials that you may want to read if you do not have the related background. Other papers are useful for your term paper.

PART I. PRODUCTION WITH HEDGING AND SPECULATION

Sep. 7: Single Period Forward Hedging


△ Hull, J. C. Options, Futures and Other Derivatives, any edition. (Review the basic concepts of futures and forward markets.)


Sep. 13 (Thursday 1:30pm): Hedging with Multiple Futures or Multiple Periods


** Sep. 21 (W2740): Options, Hedging Cost, and Other Issues **


** Part II. Operations Management in the Presence of Financial Markets **

** Sep. 28 (W0768): Inventory Management and the Capital Asset Pricing Model **


Introduction to Project Valuation Techniques
(Discounted Cash Flow, Replicating Portfolio, Risk-Neutral Valuation, Utility Maximization, CAPM)


Hull, J. C. Options, Futures and Other Derivatives, any edition.

Introduction to Continuous-Time Finance

* Intuitive Derivation of Some Continuous-Time Finance Theories (Lecture Notes by Owen Wu).

Oct. 5 (E1540): Inventory Management with Financial Hedging


Oct. 12 (E1550): Introduction to Commodity Price Models
(Descriptive models belong to Part III of the course, but they are important for prescriptive models in Part II.)


** Oct. 18 (E1530 1:30–3pm), Oct. 19 (E1530 8:30-10am): Commodity Procurement and Sales **


** Oct. 26 (E1530): Real Options **


** Nov. 2 (E1550): Global Supply Chain Management **


** Nov. 9 (K1320): Value of Operational Flexibility **


Nov. 16 (W2759): Supply Chain Contracts with Financial Hedging


Nov. 23: Happy Thanksgiving.

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PART III. INVENTORY AND FINANCIAL MARKETS BEHAVIOR

Oct. 12: Introduction to Commodity Price Models
(See Oct. 12 papers in Part II)

Nov. 30 (W0768): Commodity Price Behavior


Dec. 7 (E1530): Inventory and Price Dynamics

Invited Speaker: Jacky Qin, DTE Energy. Overview of Energy Trading.


