

IOE 641 – SUPPLY CHAIN MANAGEMENT

University of Michigan – Winter 2008

IOE 2717, Mondays and Wednesdays 1:30 p.m. – 3:00 p.m.

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Course Description:

Supply chain management is a strategic tool for coordinating activities concerned with planning, implementation, and control of material, goods, information, money, and equipment flows between suppliers and customers. In IOE 641 we will focus on quantitative methods, techniques and theoretical models used in supply chain management research. We will discuss not only classical inventory management and supply chain management models, but also recent contributions to the field.

Target audience:

The course is designed primarily for doctoral students who are interested in supply chain management research. It may also be appropriate for Masters' students with strong interest in understanding the mathematical foundations of inventory management and supply chain management.

Prerequisites:

IOE 510, IOE 512, IOE 515, and IOE 541 or approval of the instructor.

The prerequisites listed here are suggested, but not required. However, familiarity with linear and non-linear optimization, probability and stochastic processes is essential.

Book (Optional):

- Evan L. Porteus “Foundations of Stochastic Inventory Theory” (FSIT), Stanford University Press

This is a great book that contains clear and concise explanations of how to apply many useful mathematical tools to inventory problems. Even if operations management is not your primary professional interest, you will find this book valuable. I highly recommend it.

Additional books (Optional):

- Paul H. Zipkin “Foundations of Inventory Management” (FIM), McGraw Hill
- Sridhar Tayur, Ram Ganeshan, and Michael J. Magazine “Quantitative Models for Supply Chain Management” (QMSCM), Kluwer Academic Publishers
- A.G. de Kok and Stephen C. Graves “Supply Chain Management: Design, Coordination and Operation”, Handbooks in Operations Research and Management Science (HORMS), Elsevier

Course Policies

Active Learning:

Numerous studies of the best educational practices have shown that “active learning” is one of the most effective learning techniques. Therefore, to help you to prepare for a successful career as an academic or industry researcher, this course is designed so that you can get immersed in the research activities early on. You will have to prepare and make presentations, serve as a discussant, write abstracts, write referee reports, perform literature searches and reviews, evaluate other students’ work, and, most importantly, identify research problem and solve them.

Presentations:

Each student is expected to prepare and make several presentations (depending on enrollment) during the semester. As a presenter, you should be as familiar with the topic, with the research problem, with the models, with the solution to the problem, and the related literature, as if you were presenting your own research. The time limit for a presentation is 1 hour (including Q&A), but it is acceptable if your presentation takes less than 1 hour. You will have to select which aspects of the paper are important enough to be included, and which ones can be omitted from your presentation. Individual presentation styles vary. However, I recommend that you start your presentation with the motivation and the clear statement of the problem, the structure of the model and assumptions, and the approach to the analysis, before presenting the main results of the papers.

The presentations will be graded based on the extent to which the presenter has attempted to understand the problem herself (himself) and has explained the problem, the topic, the models, and the results of the papers to the audience.

Discussants:

Besides a presenter, each paper will also have one or two discussants. The main task of a discussant is to provide a critique of the papers presented: the significance of the problem, the suitability of the model for the problem, the limitations of modeling assumptions and the role that those assumptions play in obtaining results, the significance of the results, and possible extensions. In addition, discussants should look for common themes or key issues that link papers and enhance our understanding of the topic. Lastly, discussants are expected to raise challenging questions that would guide class discussion.

The presenters will be given an opportunity to rebuff discussants’ critique.

If you are neither a presenter nor a discussant, you are still expected to read the assigned papers and to participate in the discussion. You will be graded based on the quality of the comments that you provide. You may be called upon and asked to lead the discussion.

Referee Reports:

Two referee reports are required to be turned in during the semester. **Referee reports must be written by each student individually.** Further description of the peer-review process and report guidelines will be distributed in class.

Abstracts:

An ability to convey the assumptions and contributions of one's paper succinctly is a valuable skill for both practitioners and academics. You are required to submit brief abstracts of the papers assigned by the instructor before the first class in which the papers is discussed. **Abstracts should not be longer than 300 words.** You can use "word count" tool in Word or other word processing software to verify the compliance with the word limit. **Abstracts must be written by each student individually and must be typed** (12pt Times, Times New Roman, or default LaTeX font, 1 inch margins on all sides, **double-spaced**). When writing an abstract for a paper, put yourself in the position of the author and try to describe your work so that the readers will have a very clear picture of what you have accomplished and will feel compelled to read the rest of the paper. Remember that readers' time is valuable and you are competing for it with many other authors. I suggest that, in your abstract, you mention the research problem, the model that was used to solve the problem, and the most important and exciting results. Usually, abstracts, which are specific are more effective in capturing readers' attention.

Your work will be graded for comprehensiveness and pithiness.

Final Paper:

The final paper presents you with an opportunity to take another step closer to an independent research. The final paper is due on April 22, 2008 (you are allowed to turn it in sooner). It should be **at most (shorter papers are perfectly acceptable!)** 15 typed pages (12pt Times, Times New Roman, or default LaTeX font, 1 inch margins on all sides, **double-spaced**). You can choose one of the two alternatives for the final paper:

Week 1. **Research Proposal.** In your proposal you should

- a. Identify an open research question: either an interesting real world phenomenon or a gap in the existing literature.
- b. Discuss what is already known in the literature about this research question. Your literature review should emphasize the importance of the topic and point out how relevant papers fail to address the question or do not provide a satisfactory answer.
- c. Outline a suitable model to address the question and sketch the analysis one would want to carry out.
- d. Present preliminary results and indicate what exciting results you expect to derive if this proposal is funded.

Think of your document as a proposal you are submitting to a funding agency (say, the National Science Foundation), which relies on a peer-review process to allocate funds. You can expect that your reviewers are familiar with the general research area (Supply Chain Management), but are not experts in your particular subfield. You can also count on the reviewers to be very bright, but extremely

busy academic or industry professionals. Your goal is to convince them that your research will address a very important and very timely problem (sections on the problem statement, problem motivation, literature review will serve to accomplish that), and that, if the agency gives you money, you are likely to succeed (sections on the model and the outline of the analysis should help them to make that decision).

The research proposal will be graded based on how much I am compelled to grant you funding.

Week 2. Results of the Original Research. Under this option, you should identify an open research question: either an interesting real world phenomenon or a gap in the existing literature; and attempt to answer it. The objective is to obtain original results that add to the existing knowledge. Similar to the Research Proposal, your report for this alternative should make it clear what research problem you are solving and why this problem is important. But your report should emphasize the results you obtained. I recommend this alternative for doctoral students because I hope that you will be able to publish your results. **The more papers you will have published or submitted by your graduation, the better you will do on the job market.**

Doing research is not easy and I do not expect that you will have the complete answer to a problem (especially, a difficult problem). Therefore, your work will be graded based both on the importance of the problem and the significance of the results.

Please, turn in a brief description (up to 100 words) of your plans for the proposal or original research by March 5th, 2008.

Homework:

Homework will be assigned in class occasionally. Unless otherwise indicated, each problem will be worth 10 points. **Teamwork for homework assignments is allowed and encouraged.** Please, see section on teamwork for details. The homework assignments will be graded for accuracy.

Teamwork:

Collaborative work is a norm both in industry and academia. Therefore, you are strongly encouraged to work in teams (up to 3 students, depending on the number enrolled) on homework assignments. Unless otherwise indicated, you can submit a single report per team. Make sure that you include in your report the names of all (and only those) team-members who made a significant contribution. You and your “co-authors” will share the responsibility for the contents of your report equally.

It is a great idea to collaborate in your preparation for class discussions and presentations. I also expect that you, the future professors, researchers, and managers, will take advantage of the opportunity to help other students if needed.

CTools:

The majority of resources for this course (e.g. book chapters, homework assignments) will be posted on CTools for IOE 641 (<http://ctools.umich.edu>). I would appreciate it, if you posted your course-related questions, your presentation slides (if you are willing to share them), interesting course-related articles, and other materials on CTools as well. You can post questions pertinent to the course material under Discussion section of the website. I have configured the folder Papers so that anyone of us can modify it. I would also appreciate it if you used CTools when submitting any assignments in this course. Finally, feel free to use CTools site to help each other with for IOE 641.

LaTeX:

If you are planning to submit reports and solutions containing a fair amount of mathematical equations in them, you might find LaTeX to be a useful instrument for creating them. LaTeX software is not WYSIWYG like MS Word, and requires some learning (similar to a programming language). However, if you are planning to write mathematical articles in the future, it might be worthwhile investment of your time to learn LaTeX soon. If your advisor uses LaTeX, most likely you will have to use it too and this may be a great opportunity to get started. I will be glad to provide you with resources and recommendations for learning and using LaTeX.

Make-ups, Excuses, etc.:

If you anticipate a problem, let me know at once (see the contact information above).

Attendance and Class Participation:

Active class participation is important. You are expected to come to class prepared for the day's discussion. Class performance contributes to your final grade.

Ethics:

All students are expected to be familiar with the **Engineering Honor Code** (<http://www.engin.umich.edu/students/honorcode/>) and are bound by its requirements. Regardless of your affiliation, you should be guided by the highest professional and ethical standards of your field.

Assistance:

It is your responsibility to keep up with the material. But if you find that you are falling behind and you feel that the course material is extremely difficult, **do not hesitate to seek help**. Make an appointment with the instructor. Ask other students. Remember that the longer you wait before dealing with the problem the harder it will be to fix it.

Feedback:

All of us share the same goals for this course: to learn how to do research in supply chain management and to have fun. Therefore, if you have any problems with the course, the instructor, or if you have any ideas how to make this course more useful, understandable, or enjoyable, please, do not hesitate to contact me at any time!!! **Your feedback will be greatly appreciated and counted towards your class participation!!!**

Grading (approximate):

Class participation	10%
Homework assignments and abstracts	20%
Presentations and Discussant Service	30%
Referee Reports and Final Paper	40%

Course Outline

Below is a tentative list of topics that will be covered. Please, see the Excel file with topic assignments for the most recent list. The major papers (the ones that are used for reports and abstracts) for each topic are highlighted by boxes. The non-highlighted papers are included to provide you with a deeper understanding of or a different perspective on the topic. You must(!) read the highlighted papers in preparation for classes and try(!) to read the non-highlighted ones as your schedule allows. The content and the order of topics on this list can be adjusted from time to time depending on how the class proceeds and depending on your interests. Please, feel free to contact the instructor if you would like to include (or exclude) some topics.

Some of the working papers and book chapters will be posted on CTools. However, I will depend on you to locate published papers (this is a part of the active learning process). Please, do not hesitate to contact me if you would like a few tips on using library resources or if you are having difficulties finding some papers.

Week 1.

January 7, 2008. Introduction to Research in Supply Chain Management. Optimization Applications: EOQ and Newsvendor models

- Ganeshan R., E. Jack, M. J. Magazine, and P. Stephens. 1998, “A Taxonomic Review of Supply Chain Management Research”, in QMSCM, 839 – 879
- De Kok and S. Graves 2003, “Introduction”, in HORMS, 1 – 16
- FSIT, Chapter 1

January 9, 2008. Dynamic Programming Applications: Base-stock Inventory Policies

- FSIT, Chapters 4, 6

Week 2.

January 14, 2008. Dynamic Programming Applications: Base-stock Inventory Policies

- FSIT, Chapters 4, 6

January 16, 2008. Dynamic Programming Applications: (s, S) Inventory Policies.

- FSIT, Chapters 7

Week 3.

January 21, 2008. Martin Luther King Holiday.

January 23, 2008. Basic Game Theory Concepts and Applications to Supply Chain Management.

- Netessine S. and G. Cachon, 2004, “Game Theory in Supply Chain Analysis”, Chapter 2, in “Handbook of Quantitative Supply Chain Analysis: Modeling in the E-Business Era”, edited by D. Simchi-Levi, S. D. Wu and M. Shen, Kluwer
- Moorthy, K. Sridhar, 1985, “Using Game Theory to Model Competition”, Journal of Marketing Research, 22(3), 262 – 282

- Gerard P. Cachon, 2003, “Supply Chain Coordination with Contracts”, Chapter 6, in HORMS, 229 – 340

Week 4.

January 28, 2008. Wholesale-price contracts.

- Lariviere, M. A. and E. L. Porteus, 2001, ”Selling to the Newsvendor: an Analysis of Price-Only Contracts”, M&SOM, 3(4), 293 – 305 (*Presentation/Abstract*)
- Joseph J. Spengler, 1950, “Vertical Integration and Antitrust Policy”, Journal of Political Economy, 58(4), 347 – 352
- Gerard P. Cachon, 2003, “Supply Chain Coordination with Contracts”, Chapter 6, in HORMS, 229 – 340
- Tsay A., Nahmias S., and Agrawal N., “Modeling Supply Chain Contracts: A Review”, Chapter 10, in QMSCM, 299 – 337

January 30, 2008. Buyback contracts.

- Pasternack B. A., 1985, “Optimal Pricing and Return Policies for Perishable Commodities”, Marketing Science, 4(2), 166 – 176 (*Presentation/Abstract*)
- Padmanabhan V. and I. P. L. Png, 1997, “Manufacturer’s Return Policies and Retail Competition”, Marketing Science, 16(1), 81 – 94
- Padmanabhan V. and I. P. L. Png, 1995, “Return Policies: Make Money by Making Good”, Sloan Management Review, 37(1), 65 – 72
- Gerard P. Cachon, 2003, “Supply Chain Coordination with Contracts”, Chapter 6, in HORMS, 229 – 340
- Tsay A., Nahmias S., and Agrawal N., “Modeling Supply Chain Contracts: A Review”, Chapter 10, in QMSCM, 299 – 337

Week 5.

February 4, 2008. Revenue Sharing Contracts.

- Cachon G., M. Lariviere, 2005, “Supply chain coordination with revenue sharing contracts: strengths and limitations”, Management Science, 51(1), 30 – 44 (*Presentation/Abstract*)
- Julie H. Mortimer, 2002, “The Effects of Revenue-Sharing Contracts on Welfare in Vertically-Separated Markets: Evidence from the Video Rental Industry”, working paper, Harvard University
- Gerard P. Cachon, 2003, “Supply Chain Coordination with Contracts”, Chapter 6, in HORMS, 229 – 340
- Tsay A., Nahmias S., and Agrawal N., “Modeling Supply Chain Contracts: A Review”, Chapter 10, in QMSCM, 299 – 337

February 6, 2008. Real Options in Supply Chains.

- Barnes-Schuster D., Y. Bassok, R. Anupindi, 2002, “Coordination and Flexibility in Supply Contracts with Options”, M&SOM, 4(3), 171 – 207 (*Presentation/Abstract*)
- Burnetas A. and P. Ritchken, 2005, “Option Pricing with Downward Sloping Demand Curves: The Case Of Supply Chain Options”, Management Science, 51(4), 566 – 580

- He, H., R. Pindyck, 1992, “Investments in flexible production capacity”, *Journal of Economic Dynamics Control*, 16, 575 – 599
- Merton, R., 1973, “Theory of rational option pricing”, *The Bell Journal of Economics and Management Science*, 4, 141 – 183
- Ritchken, P., C. Tapiero, 1986, “Contingent claims contracting for purchasing decisions in inventory management”, *Operations Research*, 34, 864 – 870
- Tsay A., Nahmias S., and Agrawal N., “Modeling Supply Chain Contracts: A Review”, Chapter 10, in *QMSCM*, 299 – 337
- Birge J. 2000, “Option Methods for Incorporating Risk into Linear Capacity Planning Models”, *M&SOM*, 2(1), 19 – 31

Week 6.

February 11, 2008. Competition and Option Contracts.

- Victor Martinez-de-Albeniz and David Simchi-Levi, 2004, “Competition in the Supply Option Market”, working paper (*Presentation/Abstract*)
- He, H., R. Pindyck, 1992, “Investments in flexible production capacity. *Journal of Economic Dynamics Control*”, 16, 575 – 599
- Merton, R., 1973, “Theory of rational option pricing”, *The Bell Journal of Economics and Management Science*, 4, 141 – 183

February 13, 2008. Multi-Echelon Inventory Systems.

- Clark, A. J. and H. Scarf, 1960, “Optimal Policies for a Multi-Echelon Inventory Problem”, *Management Science*, 6(4), 474 – 490 (*Presentation/Abstract*)
- Dong L., Hau L. Lee, 2003, “Optimal Policies and Approximations for a Serial Multiechelon Inventory System with Time-Correlated Demand”, *Operations Research*, 51(6), 969 – 980
- Rosling K., 1989, “Optimal Inventory Policies for Assembly Systems under Random Demand”, *Operations Research*, 37(4), 565 – 579

Week 7.

February 18, 2008. Bullwhip Effect.

- Lee, Hau L. V. Padmanabhan, and Seungjin Whang, 1997, “Information Distortion in a Supply Chain: The Bullwhip Effect”, *Management Science*, 43(4), 546 – 558 (*Presentation/Referee Report*)
- Chen F., Z. Drezner, J. Ryan, and D. Simchi-Levi, 2000, “Quantifying the Bullwhip Effect in a Simple Supply Chain: The Impact of Forecasting, Lead Times, and Information”, *Management Science*, 46(3), 436 – 443

February 20, 2008. Coordination of the Dynamic Two-location Model. Subsidies to the Retailer.

- Cachon, G. P., P. H. Zipkin, 1999, “Competitive and cooperative inventory policies in a two-stage supply chain”, *Management Science*, 45, 936 – 953 (*Presentation/Abstract*)

- Gerard P. Cachon, 2003, “Supply Chain Coordination with Contracts”, Chapter 6, Sections 7 and 8, in HORMS, 229 – 340
- Lee, H. and S. Whang, 1999, “Decentralized multi-echelon supply chains: incentives and information”, Management Science, 45(5), 633 – 640

Week 8.

March 3, 2008. Coordination of the Dynamic Two-location Model. Subsidies to the Supplier.

- Gupta, D., W. Weerawat, 2006, “Supplier-manufacturer coordination in capacitated two-stage supply chains”, European Journal of Operations Research, 175(1), 67 – 89 (*Presentation/Abstract*)
- Gerard P. Cachon, 2003, “Supply Chain Coordination with Contracts”, Chapter 6, Sections 7 and 8, in HORMS, 229 – 340
- Caldentey, R., Wein, L, 2003, “Analysis of a Decentralized Production-Inventory System” M&SOM, 5, 1 – 17

March 5, 2008. Coordination with Internal Markets

Description of the Proposed Research is Due .

- Kouvelis, P. and M. Lariviere, 2000, “Decentralizing cross-functional decisions: coordination through internal markets”, Management Science, 46(8), 1049 – 1058 (*Presentation/Abstract*)
- Gerard P. Cachon, 2003, “Supply Chain Coordination with Contracts”, Chapter 6, in HORMS, 229 – 340
- Porteus, E. and S. Whang, 1991, “On manufacturing/marketing incentives”, Management Science, 37(9), 1166 – 1181

Week 9.

March 10, 2008. Risk Preferences.

- Eeckhoudt L., C. Gollier, and H. Schlesinger, 1995, “The risk-averse (and Prudent) Newsboy”, Management Science, 41(5), 786 – 794 (*Presentation/Abstract*)
- Anvari, M., 1987, “Optimality Criteria and Risk in Inventory Models: The Case of the Newsboy Problem”, Journal of the Operations Research Society, 38, 625 – 632
- Szieso G, 2002 “Measures of Risk”, Journal of Banking and Finance, 26, 1253 – 1272
- Agrawal, V. and S. Seshadri, 2000, “Impact of Uncertainty and Risk Aversion on Price and Order Quantity in the Newsvendor Problem”, Manufacturing and Service Operations Management, 2(4), 410-423.

March 12, 2008. Risk Aversion and Coordination.

- Xianghua Gan , Suresh P. Sethi, Houmin Yan, 2004, “Coordination of Supply Chains with Risk-Averse Agents”, POMS, 13(2), 135 – 149
- Van Mieghem J, 2004, “Risk-Averse Newsvendor Networks. Resource Sharing, Substitution, and Operational Hedging”, working paper

Week 10.

March 17, 2008. Risk Management in Operations via Financial Hedging.

- Q. Ding, L. Dong, P. Kouvelis, 2007, “On The Integration of Production and Financial Hedging Decisions in Global Markets”, *Operations Research*, 55(3), 470 - 489 (*Presentation/Abstract*)
- R. Caldentey, M. Haugh, 2005, “Supply Contracts with Financial Hedging”, working paper, NYU
- Gaur, V., Sridhar Seshadri, 2005, “Hedging Inventory Risk through Market Instruments.”, *M&SOM*, 7(2), 103-120

March 19, 2008. Supply Risk

- Federgruen A., N. Yang 2006, “Safeguarding Strategic Supplies: Selecting An Optimal Set of Suppliers”, working paper (*Presentation/Abstract*)
- Tomlin B., 2005, “The Impact of Supply-Learning on a Firm's Sourcing Strategy and Inventory Investment when Suppliers are Unreliable”, forthcoming in *MSOM*
- Henig, M., Y. Gerchak, 1990, “The structure of Periodic Review Policies in the Presence of Random Yield”, *Operations Research*, 38(4), 1990, 634 – 643
- Ciarallo F., R. Akella, T. Morton, 1994, “A Periodic Review, Production Planning Model with Uncertain Capacity and Uncertain Demand – Optimality of Extended Myopic Policies”, *Management Science* 40(3), 320 – 332
- Dada M., N. Petruzzi, L. Schwarz 2007 “A Newsvendor’s Procurement Problem when Suppliers are Unreliable”, 9(1), 9 – 32
- Hendricks, K. B., V. R. Singhal, 2003, “The effect of supply chain glitches on shareholder wealth”, *Journal of Management*, 21, 501 – 522
- Hendricks, K. B., V. R. Singhal, 2005, “Association between supply chain glitches and operating performance”, *Management Science*, 51(5), 695 – 711

Week 11.

March 24, 2008. Supply Risk and Competition.

- Babich V., A. Burnetas, and P. Ritchken, 2005, “Competition and Diversification Effects in Supply Chains with Supplier Default Risk”, working paper (*Presentation/Abstract*)
- Anupindi R. and R. Akella, 1993, “Diversification Under Supply Uncertainty”, *Management Science*, 39(8), 944 – 963

March 26, 2008. Joint Financial and Operational Decisions.

- Li, L., M. Shubik, and M. J. Sobel, 1997, “Production with Dividends and Default Penalties”, working paper. (*Presentation/Referee Report*)
- Babich V. and M. Sobel, 2004, “Pre-IPO Operational and Financial Decisions”, *Management Science*, 50(7), 935 – 948
- Buzacott J. and R. Zhang, 2004, “Inventory Management with Asset-Based Financing”, *Management Science*, 50(9), 1274 –1292

- Chao X., J. Chen, S. Whang, “Dynamic Inventory Management with Cash Flow Constraints”, working paper.
- Xu X., J. Birge 2004 “Joint Production and Financing Decisions: Modeling and Analysis”, working paper

Week 12.

March 31, 2008. Financing in Supply Chains.

- Gupta, D., L. Wang 2005, “A Stochastic Inventory Model with Trade Credit”, forthcoming in MSOM (*Presentation/Abstract*)
- Babich V. G. Aydin, P.-Y. Brunet, J. Keppo, R. Saigal “Risk, Financing and the Optimal Number of Suppliers”, working paper
- Peterson M., R. Rajan 1997 “Trade Credit: Theories and Evidence”, *The Review of Financial Studies*, 10(3), 661 – 691

April 2, 2008. Dynamic Games in Supply Chains.

- Taylor T., E. Plambeck 2007, “Supply Chain Relationships and Contracts: The Impact of Repeated Interaction on Capacity Investment and Procurement”, *Management Science*, 53(10), 1577 – 1593 (*Presentation/Abstract*)
- Hu Q., M. Sobel 2005 “Supply Chain Games”, working paper

Week 13.

April 7, 2008. Asymmetric Information.

- Cachon, G., M. Lariviere, 2001, “Contracting to Assure Supply: How to Share Demand Forecasts in a Supply Chain,” *Management Science*, 47(5), 629 – 646 (*Presentation/Abstract*)
- Gerard P. Cachon, 2003, “Supply Chain Coordination with Contracts”, Chapter 6, in *HORMS*, 229 – 340

April 9, 2008. Asymmetric Information.

- Corbett C. J., D. Zhou, C. S. Tang, 2004, “Designing Supply Contracts: Contract Type and Information Asymmetry”, *Management Science*, 50(4), 550 – 559 (*Presentation/Abstract*)
- Corbett, C. J., C. S. Tang, 1999, “Designing supply contracts: Contract type and information asymmetry” , *QMSCM*
- Corbett, C. J., X. de Groote, 2000, “A Supplier’s Optimal Quantity Discount Policy Under Asymmetric Information”, *Management Science*, 46(3), 444 – 450
- Iyer A., L. Schwarz, S. Zenios, 2005, “A Principal-Agent Model for Product Specification and Production”, *Management Science*, 51(1), 106 – 119

Week 14.

April 14, 2008. Competition and Supply Chain Structure.

- C. J. Corbett, U. S. Karmarkar, 2001, “Competition and Structure in Serial Supply Chains with Deterministic Demand”, *Management Science*, 47(7), 966 – 978
(*Presentation/Abstract*)

April 22, 2008. Final Paper is Due