

Economics 705-II: Spring 2018

Instructor and Lecture Information

Instructor: Todd Sarver
Time: Tuesday and Thursday 1:25–2:40pm
Classroom: SS136
Office: SS232
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Office hours: Tuesday and Thursday 2:40–3:40pm or by appointment
Exam: Thursday, May 3, 9am–12pm, SS136

Teaching Assistants

Aram Grigoryan
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Course Overview

This half of 705 will focus primarily on comparisons of risk and information and how individuals, firms, and other economic agents respond to changes in deterministic or stochastic variables, or to information. The central tools for this analysis are referred to as monotone comparative statics. The results developed in this part of the course can be used to address a wide array of economic questions. For example, under what conditions on a production function will a decrease in the price of labor lead to an increase in the demand for capital? What type of changes in the distribution of a risky asset will lead an expected-utility maximizer to increase her investment in that asset? How do changes in cost for one firm affect the equilibrium production decisions of competing firms?

We will begin with the study of monotone comparative statics in deterministic environments, and then extend the results developed there to deal with risk. Along the way, we will review several important stochastic orders that you have seen in earlier parts of the microeconomics sequence: first-order stochastic dominance, second-order stochastic dominance, and the monotone likelihood ratio property. Then we will determine conditions that give a monotone response of endogenous decision variables to changes in the distribution of exogenous variables according to one of these stochastic orders. The last part of the course will deal with information. As you have already seen in the first half of 705, imperfect information has been one of the most important areas of research in economics in recent years. We will develop some additional techniques for the study of information economics, such as different approaches to modeling information and how to compare information structures.

Textbooks

Given the more advanced nature of the topics in this course, there is no book that is a perfect fit. The primary references will be a combination of research papers and lecture notes.

If you feel strongly that you would benefit from a textbook treatment of the topics in this course, a useful (albeit expensive) text is *Supermodularity and Complementarity* by Donald Topkis. Another book that overlaps with some of the material is *The Economics of Risk and Time* by Christian Gollier. Note that both of these books are strictly optional. Although we will not use it a great deal for this part of the course, some lectures will follow material in *Microeconomic Theory* by Mas-Colell, Whinston, and Green. While also optional, it is a useful reference for any economist.

Grading

Your overall grade for Econ 705 will be determined by aggregating your performance in each half of the course. Evaluation for this part of the course will be based on graded problem sets (20%) and a final exam (80%). I will typically select one problem from each problem set at random for grading, and the score for that problem set will be based solely on the selected question. Students are permitted—even encouraged—to work together in groups on problem sets, but each student must submit his/her own copy of the assignment. The TAs will present solutions to the assignments during discussion sessions. However, written solutions will not be distributed.

Outline

This part of the course is still in the “beta” testing phase, which means there is still some uncertainty about the exact order of topics and extent of coverage. The following is a tentative outline.

1. Monotone Comparative Statics [1.5 weeks]
 - (a) Supermodularity and increasing differences
 - (b) Quasisupermodularity and the single crossing property
 - (c) Applications
2. Games with Strategic Complementarities [1.5 week]
3. Comparing Risk and Risk Aversion [1 week]
 - (a) First-order stochastic dominance

- (b) Monotone likelihood ratio property and log-supermodularity
- (c) Second-order stochastic dominance
- 4. Monotone Comparative Statics under Risk [1 week]
- 5. Modeling and Comparing Information [1 week]
 - (a) Deterministic signals and partitions
 - (b) Stochastic signals
 - (c) Comparing information: value of decision problems, garbling of signals, distributions over posteriors
 - (d) Blackwell's theorem
 - (e) Applications