Professor Robert A. Miller
Bargaining, Reputation and Strategic Investment
Carnegie Mellon University
45-976, Mini 3, 2005

SYLLABUS

Overview

Bargaining, Reputation and Strategic Investment analyzes strategic problems in industrial relations and industrial organization. Following the approach of 45-974 and 45-975, the course teaches you how to model strategic situations in business, how to solve the models by learning through experience playing the games, how to apply the solution concepts directly, and how to analyze the experimental outcomes when your student colleagues play these games. The first half of the course focuses upon bargaining, contracts and strategies for managing risk. The second half deals investment and capital accumulation in strategic contexts.

Contact hours

My email is ramiller@andrew.cmu.edu and my phone number is 412 268-3701. The office hours will be held after the class or by appointment.

Course Material and Textbook

The course extensively uses both Comlabgames modules, found at

http://www.comlabgames.com

Comlabgames is free software for designing, running and analyzing experimental games over the Internet for teaching, consulting and research purposes.

All the other course material (including this syllabus and a link to the textbook) is posted at the course website:

http://www.comlabgames.com/45-976

The text for this class is "Strategic Play" written by Vesna Prasnikar and myself (Stanford University Press, forthcoming 2005). The lectures are drawn from the six chapters in Parts V and VI, that is Chapters 11 through 15, as well as Chapters 2 and 3 in Part I. A draft version of the manuscript is posted at:

http://wpweb2k.gsia.cmu.edu/strategicplay/

user id: strategicplay
password: draft

Requirements

Each class session you should bring to your laptop with a wired Internet connection to design, conduct and participate in experiments. Please use a wired connection. In contrast to wired connections, wireless connections sometimes fail.

Prerequisite

The only prerequisite for this course is **Experimental Methods for Business Strategy**, 45-974. There is no overlap between **Strategic Play in Auctions and Markets**, 45-975 and **Bargaining, Reputation and Strategic Investment** 45-976, but the respective approaches are complementary, and you are welcome to take all three units.

Assessment

Roughly speaking, this course treats theory, empirical methods and your personal application of strategic behavior, as three equally important parts. There is one project, based on experiments conducted in the seventh session. The project counts 70 percent of your grade. An additional 30 percent will be allocated on the basis of how well you play the games designed by your colleagues. Each student will run and write up their own project; however collaboration in the experimental design and the analysis of the results between partners (up to teams of 3) is permitted, and indeed encouraged. You should simply state with whom you collaborate, because how study partners play in your game will not count towards their grade

1. Bargaining

Summary
The simplest bargaining game is when one person makes a final proposal to another, and the responder is limited to either accepting or rejecting the proposal. Beginning with this game, we work through steadily more complicated bargaining games, analyzing their structure, exploring their outcomes with experiments, and deriving their solutions. We demonstrate how the solution depends on the rules governing negotiation, the information each player has, and the number of players seeking to reach an agreement. We explain why many bargaining games end on the first round, and why bargaining that that continues beyond the first round is inherently unpredictable. Applications in this area include bargaining between a firm and its upstream suppliers, between management and unionized labor, and even divorcing spouses.

Preparation
Please disable the firewalls on your laptop and install the Comlabgames free form server, client and log.

Reading
Chapter 14 Bargaining

Key words
- Ultimatum game
- First mover
- Responder
- Multiple responders
- Plurality and exploitation
- Counter proposal
- Alternating offers
- Incomplete information
- Breakdown and industrial action
- Matching and multilateral bargaining
- Pre nuptial agreements
- The no trade theorem
- Sharing blame

2. Contracts

Summary
In bargaining games the rules and conventions are typically set in advance. This session is concerned with how the rules are determined, that is the design and analysis of contracts. The basic principle of rent extraction is explained and applied in several applications, including those where parties to the contract are differentially informed. We analyze managerial compensation schemes, show how they should be designed to elicit private information and induce desirable behavior.

Preparation
Please read the instructions on how to run your own experiments using the free form module of Comlabgames.

Reading
Chapter 15 Contracts

Key words
- Principal agent relationships
- The rent extraction principle
- Participation and alternatives
- Incentive compatibility
- Hidden information
- Moral hazard
- Telling the truth
- Revelation principle

3. Risk, Entrepreneurship and Insurance

Summary
This lecture focuses on personal risk management in a strategic world, especially as it relates to entrepreneurs. First we discuss risk and uncertainty from a personal perspective, conducting several experiments in an attempt to elicit your own attitudes towards uncertainty and preferences about risk taking behavior. Then we describe ways of assessing non-tradable risky ventures, (including risk reduction and insurance) within your overall wealth portfolio. This leads naturally into a discussion of entrepreneurship, the extent and terms of risk that venture capitalists are likely to impose on entrepreneurs, and the process of rent seeking by creating new markets from novel ideas.

Preparation
Please open the log files of the data from the experiments we have run, and as a check on your own progress in understanding the concepts we have developed thus far in the course, compare your choices and payoffs with those of your colleagues.

Reading
Chapter 15 Contracts
Chapter 3 Decision Analysis under Uncertainty

Key words
- Rational behavior
- Independence axiom
- Expected utility
- Certainty equivalence
- Risk aversion
- Risk aversion and the strategic form
- Portfolio risk
- Insurance
- Creating markets from new ideas
- Governance
- Signaling
- Venture capital
- Adverse selection

4. Experimental Design and Analysis

Summary
The first part of this is session is an introduction to designing experiments with the free form module, while the second part (which builds on what you have already learned from 45-974) is devoted to analyzing the data from experimental sessions. To illustrate the concepts we will draw heavily on the experiments we have undertaken in the first three sections, and the choices you made in class.

Preparation
Down load the server module of Comlabgames, so that we can work through the basic features of designing games together

Reading
Chapter 2 Analyzing Experimental Data

5. Strategic Investment

Summary
Strategic investment be distinguished from other forms of investment, such as learning or physical investment, because it is inextricably tied to the reputations that people make for themselves through their interactions with others. We explain the situations in which reputations can be made or broken, show why it happens, provide a definition of leadership, and illustrate situations where leaders are effective. Long-term relationships open the possibility of using a dynamic system of rewards and punishments to reach a mutually acceptable sequence of outcomes. This discussion naturally leads into an analysis of reputation, implicit contracts and commitments that are made by several players in enduring relationships or by one player acting unilaterally. Dynamic pricing games between longstanding rivals are included in the applications we shall consider in this session.

Preparation
The motivation for your project is due, along with a trial version of your game.

Reading
Chapter 12 Strategic Capital

Key words
- Repeated games
- Reputation as subgame perfection
- Stage games
- Finitely repeated games
- Unique solution
- Multiple solutions
- Coordination
- Leadership
- Folk theorem
- Infinite horizon repeated games
- Punishment strategies
- Trigger strategies
- Price wars
- Strikes and work to rules
- Collusion and anti-trust law

6. Markov Games

Summary
Markov games are dynamic games between fixed numbers of players (not all of whom are necessarily "active"), where the state of play at any one time are partly determined by previous investment decisions. For example, war is often an outcome of an arms race. We investigate investment decisions in plant capacity by rivals, how to acquire and maintain reputations for producing high quality products, the pace of product development and obsolescence, as well as other problems in business that require managers and professionals to weigh current benefits against prospective future gains. In this final part of the course we also consider the use of advertising and pricing policies as signaling devices, and the tactical withdrawal from a product line when the firm's clients are not well informed about the company's overall health.

Preparation
The game for the project is due.

Reading
Chapter 11 Investment
Chapter 13 Markov Games

Key words

- Incomplete information
- Entry with unknown costs
- Product pricing with unknown quality
- Optimal depletion
- Differential information in markets
- Market breakdown
- Signaling
- Advertising and price policy as a signaling devices
- Sequential entry into a growing market
- Irreversible investment and commitment
- Cournot and Bertrand capacity decisions
- Preemptive capacity and entry deterrence strategies
- Strategic contraction and dissipating reputation

7. Experiments for Second Project

Summary
After the project games have been run, I will provide a summary statement of main lessons that can be drawn from this course.

Preparation
Please be ready to conduct your experiments and participate as a subject in the experiments of your colleagues.