Economics 147: Bargaining Theory and Applications
Spring 2007

Professor: Pedro Dal Bó
Classes: T.&Th. 1:00- 2:20 PM at Rhode Island Hall 201
Office Hours: Th. 2:30-4: PM in Robinson Hall 302B

TA: Francisco Campos Ortiz
TA Sessions: F. 12:00-12:50 PM and F. 3:00- 3:50 PM at Metcalf Chem. Bldg. 305
TA Office Hours: F. 1:00-2:50pm in Robinson Hall Basement

Description of the course: The first part of the course will focus on the general study of economic behavior in situations of strategic interaction (know as Game Theory). The last two parts of the course will cover the strategic and axiomatic theories of bargaining, their connections and their application to the study of economic institutions and social phenomena.

Prerequisites: Economics 111 or 113.

Grading policy: The final grade will depend on class experiments (25%), a midterm (35%) and a final exam (40%).

Textbooks: *An Introduction to Game Theory* by Martin Osborne (O).

Optional Textbooks: For the Game Theory part you can also study from the following books: *Strategy* by Joel Watson (undergrad level), *Game Theory for Applied Economists* by Robert Gibbons (basic graduate level) and *Game Theory* by Drew Fudenberg and Jean Tirole (advanced graduate level). A nice short introduction to game theory can be found in "An Introduction to Applicable Game Theory" by Robert Gibbons, *Journal of Economic Perspectives*, 11(1), 1997. For the Bargaining part you can also use *Bargaining Theory with Applications* by Abhinay Muthoo.

Part I: Fundamentals of Game Theory

I.1. Simultaneous-Move Games
I.1.a. Definitions and examples
I.1.b. Dominated strategies
I.1.c. Nash Equilibrium in pure strategies
I.1.d. The penalty game and NE in mixed strategies
I.1.e. Oligopolies: Cournot and Bertrand
Readings: O Chapters 1, 2, 3.1-3.3, 4.1-4.5, 4.8, 4.10 and 4.12
Extra Reading 1: Nagel, R., Bosch-Domench, A., Satorra, A. and García-Montalvo, J. (2002). "One, Two, (Three), Infinity: Newspaper and Lab Beauty-Contest Experiments."
Extra Reading 2: "Professionals Play Minimax" by Ignacio Palacios-Huerta for soccer fans and "Minimax Play at Wimbledon" by Mark Walker and John Wooders for tennis

fans.
Extra Reading 3: "Nash Equilibrium and the History of Economic Theory" by Roger B. Myerson, Journal of Economic Literature, 37(3), 1999, discusses the importance of Nash Equilibrium. You can go here and and here to read about the 1994 and 2005 Noble Prize to game theorists.

I.2. Sequential-Move Games
I.2.a. Definitions and examples
I.2.b. Definition of strategies
I.2.c. NE, Backward Induction and Subgame Perfect Equilibrium
I.2.d. First look at bargaining: the ultimatum game
I.2.e. Repeated games
Readings: O Chapters 5, 6.1-6-2, 7.1, 7.2, 7.6 and 7.7.
Extra Reading 1: Roth, A.E., Prasnikar, V., Okuno-Fujiwara, M. and Zamir, S. "Bargaining and Market Behavior in Jerusalem, Ljubljana, Pittsburgh, and Tokyo: An Experimental Study". American Economic Review 81(5), 1991.
Extra Reading 2: Sanfey A.G et al. "The neural basis of economic decision-making in the ultimatum game ". Science 300, 13 June 2003.
Extra Reading 3: For those interested in the theory of evolution, you can see an interesting application of the theory of repeated games in "The Evolution of Cooperation" by Robert Axelrod and William D. Hamilton, Science 211(27), 1981.
Extra Reading 4: "Cooperation under the Shadow of the Future: experimental evidence from infinitely repeated games" , American Economic Review , December 2005.

I.3. Games with Incomplete Information
I.3.a. With simultaneous moves: Bayesian Equilibrium
I.3.b. Auctions: private and common values
Reading: O Chapter 9 (but 9.7).
Extra Reading 1: Vickrey, W. "Counterespeculation, Auctions, and Competitive Sealed Tenders." Journal of Finance, 16, 1961. (Classic paper, focus on sections II and III.)
Extra Reading 2: Thaler, R. "The Winner's Curse." Journal of Economic Perspectives, 2(1), 1988.

Midterm: March 15th, usual room and time.

Midterm 2003 Answer Key
Midterm 2004 Answer Key
Midterm 2005 Answer Key
Answer Key

Part II: Axiomatic Approach to Bargaining

II.1. Nash's Bargaining Solution
II.1.a. His solution
II.1.b. Applications
II.1.c. His axioms and theorem

II.2. Nash's demand game
Readings: O Section 16.3.
Nice extra reading: "The Bargaining Problem." by John F. Nash, Jr. Econometrica, Vol. 18, No. 2. (Apr., 1950), pp. 155-162. This is an amazing classic paper!
Extra Reading 2: If unhappy about the IIA axiom then read "Other Solutions to Nash's Bargaining Problem." by Ehud Kalai and Meir Smorodinky, Econometrica, Vol. 43, No. 3. (May 1975), pp. 513-518.

Part II: Strategic Approach to Bargaining

III.1. Dictator and ultimatum games
III.2. Finite alternating offers model
III.3. Infinite alternating offers model
III.3.a. Nash equilibria
III.3.b. Subgame Perfect Equilibria
III.3.c. Risk of break down
III.3.d. Outside and inside options
III.4. War of Attrition
Readings: O Sections 16.1, 16.2 and 16.4.
Extra Reading 1: "The Ultimatum Game and the Law of Demand" by Lester Telser, The Economic Journal, 105, 1995, discusses ultimatum games and the preference for equality in major league baseball.
Extra Reading 2: "An Outside Option Experiment" by Ken Binmore, Avner Shaked and John Sutton, The Quarterly Journal of Economics, Vol. 104, No. 4. 1989.
Extra Reading 3: "Why are Stabilizations Delayed?" by Alberto Alesina and Alan Drazen, American Economic Review, 1991.

Final: 9 a.m., Fri. 05/11/2007 . This is a cumulative exam: all the material covered during the semester is included for the final.

Final 03 Answer Key (We didn't go over the topics in questions 3 and 7, so don't worry about them).
Final 04 Answer Key
Final 05 Answer Key