Game theory provides a simple, but rich framework for analysing once-off and repeated interplay between people or firms, where the manner in which each reacts depends upon the other’s reaction: strategic interaction. These interactions occur in markets, in organisations, and in the household. This subject—through lectures, experiential learning, and computer simulations—will attempt to provide students with understanding of many interactions they may encounter as managers, including price wars, wars of attrition, the value of cooperation interactions, and the value of information.

Outline of subject:

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Recommended texts:

- Bierman H.S. & Fernandez L., Game Theory with Economic Applications, Addison-Wesley, 1993. AGSM 330.015193/4 (On reserve) This is highly recommended, if not required. It has good sections on games against nature (decision analysis), Nash equilibrium, subgame perfection, and mixed strategies.
- McMillan J., Games, Strategies, and Managers, Oxford: OUP, 1992. AGSM 658.4035/8 (On reserve) A really good verbal discussion of the uses of game theory, but no game trees! I provide these in the Package lecture notes.

As well, the following books will be found useful:


Additional readings will be found below. Recommended readings are marked with an asterisk (*). A Package of course notes is available. Readings in the Package are marked with a P.

1. Strategic Decision Making

* Dixit & Nalebuff, Intro; Ch2 Anticipating your rival’s response; Ch3 Seeing through your rival’s response.
* Bierman & Fernandez, Ch5 Nash equilibrium I Ch11 Nash equilibrium II
3. Strategic Moves

* Dixit & Nalebuff, Ch5 Strategic moves.


Gardner R., Ch4 n-person games, Ch5 Non-cooperative games,

Colman A.M., Ch8 Multi-person games: social dilemmas, in his Game Theory and Experimental Games, Oxford: Pergamon, 1982. (Short loan T2/98)


Brams S.J., Ch1 International relations games, in Game Theory and Politics, NY: Macmillan, 1975. AGSM 320.0184/1

4. Credible Commitment

* Dixit & Nalebuff, Ch6 Credible commitments.

* Bierman & Fernandez, Ch23 Subgame-perfect equilibrium

Rasmusen, Ch4.1 Subgame perfectness

Gardner R., Ch6 Credibility and subgame perfection.

Ghemawat P., Ch 3: Preemptive Capacity Expansion in the Titanium Dioxide Industry

5. Repetition and Reputation

* Dixit & Nalebuff, Ch4 Resolving the Prisoner’s Dilemma; Ch9 Cooperation and coordination.

* Nowak, M., R. May, & K. Sigmund, The arithmetic of mutual help, Scientific American, 1995 P-18

* Hofstadter D., Ch29 The Prisoner’s Dilemma computer tournaments and the evolution of cooperation, in his Metamagical Themes, Penguin, 1985. P-17


Baird Gertner & Picker, Chs 2 & 5 Dynamic interaction and the extensive-form game, Reputation and repeated games.
Gardner R., Ch7 Repeated games, Ch8 Evolutionary stability and bounded rationality.
Rasmusen, Ch4 Dynamic games and symmetric information, Ch5 Reputation and repeated games with symmetric information.

6. Unpredictability
* Dixit & Nalebuff, Ch7 Unpredictability; Ch8 Brinkmanship.
* Bierman & Fernandez, Ch11.9
Gardner R., Ch3 Mixed strategies.
Rasmusen, Ch3 Mixed and continuous strategies.

7. Bargaining
* Dixit & Nalebuff, Ch10 The voting strategy; Ch11 Bargaining.
* McMillan, Ch5 Gaining bargaining power; Ch6 Using information strategically.
* Elster J., Ch14 Bargaining, in Nuts and Bolts for the Social Sciences, Camb.: CUP, 1989 P-20
* Bierman & Fernandez, Ch6 Bargaining,
Baird Gertner & Picker, Ch. 7
Gardner R., Ch12 Two-person bargains, Ch14 n-person bargaining and the core.
Rasmusen, Ch11 Bargaining.

8. Using Information Strategically
* McMillan, Ch6 Using information strategically
* Bierman & Fernandez, Ch17 Bayesian equilibrium, Ch19 Adverse selection and credit rationing
* Rasmusen, Ch2 Information

9. Bidding in Competition
* Revenge of the nerds, It's only a game, and Learning the game, The Economist, 1994, 1996, 1997 P-22
* Norton, R., Winning the game of business, Fortune, 1995, P-3
* Koselka, R., Playing poker with Craig McCaw, Forbes, 1995, P-23
* Dixit & Nalebuff, Ch12 Incentives.
* McMillan, Ch11 Bidding in competition
* R. Marks, Closed tender vs. open bidding auctions, 22 December, 1994. P-25
The Economist, Secrets and the prize, 12 October 1996, p.98. P-15
Scientific American, Making honesty pay, January 1997, p.13. P-16
Gardner R., Ch11 Auctions.
Brams S.J. & A.D. Taylor, Fair division by auctions, Ch. 9 in their Fair Division: From Cake-Cutting to Dispute Resolution, Cambridge: CUP, 1996. AGSM 303.69/4
Rasmusen, Ch12 Auctions.

10. Contracting
* Kay, Ch4 Relationships and contracts.
* Dixit & Nalebuff, Ch12 Incentives.
* McMillan, Ch8 Creating incentives; Ch9 Designing contracts; Ch10 Setting executives’ salaries.
* Bierman & Fernandez, Ch7 Involuntary unemployment.
Gardner R., Ch10 Games between a principal and an agent.
11. Choosing the Right Game: Co-opetition

* R. Koselka, Businessman's dilemma, and Evolutionary economics: nice guys don't finish last, Forbes, October 11, 1993. P-28


12. And Beyond ...

Baird Gertner & Picker, Ch. 6

For a history of game theory since Old Testament times, point your browser at the following URL:
http://www.canterbury.ac.nz/econ/hist.htm

For further surfing on the 'Net about game theory, start at the following URL:
http://www.pitt.edu/~alroth/alroth.html

Assessment

There will be three assignments and a short term project.

1. The first assignment will be handed out on Friday, June 12, and is due two weeks later, on Friday June 26, by 4 pm. This assignment is worth 15% of the final grade, and must be done individually, although students may talk (but not copy others' work).

2. The second assignment will be handed out on Tuesday, June 30, and is due on Friday, July 10, by 4 pm. This assignment is worth 15% of the final grade.

3. The third assignment will be handed out on Tuesday, July 14, and is due on Friday, July 24, by 4 pm. This assignment is worth 15% of the final grade.

4. Your project is due by 4 pm on Friday, August 14, and is worth 55% of the final grade. It may be done in groups of one, two, or three students. Please hand in a one- or two-page outline of the project topic by June 26. Groups will present brief outlines of their work on the last day of class. (See the excellent examples by Edwin Low and by Sue Strudwick in the Package (Readings 5 and 6)).

5. You should start thinking about a project as soon as possible. Please come and talk to me about (a) possible topics of application, and (b) if you want to form a team to do it. I shall hand out a list of possible (but not exclusive) topics in class, but you might like to look at some projects from previous years.

Previous projects available from Bob for perusal:

Basnayake: The Hunt for Red October, the movie
Game theory applications in naval warfare.

Beale: The America's Cup, 1983
An analysis of the strategic interactions of the winning campaign of Australia II.

Beaver: The Gulf War
Trying to unravel the misunderstandings and motives and strategies of the two sides which resulted in war and death.

Bugg: The natural-gas-pipeline game
BHP v. AGL for NSW±Victoria interconnection

Carlin: Home loan wars
Two types of player in the highly rivalrous oligopoly of mortgage lending in 1996 NSW.

Davis: The shifting sands: OPEC
A game-theory analysis of the development, formation, and demise of OPEC.

Fahy .......... Midway
Yamamoto's attack on the island failed: it relied on faulty logic, a non-credible threat, and was known of in advance.

Flynn .......... Wall Street, the movie
Applying the rules and core concepts of game theory to the world of Wall Street and the actions of Bud Fox, of the movie.

Fogarty ...... Sexual politics in Disclosure, the novel & movie
Sexual harassment — a strategic weapon in the game of office politics?

Foong ........ The Whitlam dismissal
The framework of game theory enlightens Gough's and Malcolm's deliberations in 1975.

Frith .......... Rats in the Ranks, the documentary
Analyses the interactions of the candidates for Mayor of Leichhardt. The movie records the words, actions, and musings as they happened.

Kwok .......... Signalling in the job market
Education and the MBA as a signal. (5-week)

Lam .......... Joint ventures in the oil & gas exploratory industry
Information asymmetries may allow "hidden actions"; incentives to reduce these. (5-week)

Lim .......... Ransom — strategic interactions in kidnapping
Should extortionists be paid? Watch Mel Gibson turn the tables.
Analyses three interactions in the movie.

Loncar ...... Croatia's strategies in the fall of Yugoslavia
David v. Goliath: Croatia's political and military strategies during the fall of Yugoslavia.

Low .......... R.J.R. Nabisco: the world's richest auction P-5
Barbarians at the Gate helps answer two questions:
• can game theory explain the protagonists' action in the L.B.O.?
• would a game theorist have acted differently?

McKay ...... The Pacific War 1941-45: its beginning and end
Was the war inevitable? Why did the negotiations to end it fail?
Analysis of the Japanese and US diplomatic and military strategies.

Mutesigensi An analysis of a Ugandan student strike in which two students were killed: a "lose-lose" outcome, which might have been avoided.

Pandey ...... Winning the Sydney 2000 Olympics
"The Bid" — Australia's strategy in winning the Olympics.

Salvador .... The Marco ouster
In 75 hours a small group of soldiers toppled the President. Credible commitments and asymmetric information in the coup.

Sayers ...... The Bonfire of the Vanities
Master of the Universe or Master of the Game. McCoy falls. Analysis of three interactions in the novel.

Shergold .... Australian pay-TV
Game theory applied to three key interactions:
1. Optus and Telecom's cable rollouts
2. Murdoch v. Packer over Rugby League

Smith ........ Conrad's Nostromo, the novel

By modelling three games embedded in the novel's storyline, shows how game theory can help in the analysis of the plot.

Strudwick .. Celluloid games: Cannes Film Festival P-6
Selling cinematic rights for independently produced motion pictures on the Riviera analysed.

Thilges ...... China-Taiwan-USA- international foreign policy
China v. Taiwan in 1995: or Shells over the straits.

Viney .......... Mahathir-Keating: recalcitrant duo?
Malaysia v. Australia: A three-week spat analysed.

Yan .......... Hong Kong Chinese newspaper price war
The entrance of the "Apple Daily" and the following price wars.