Wharton School
Fall 2012(9/05-10/17)

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MGMT 784: Managerial Economics and Game Theory

This is a mini course elective in Game Theory and Strategy. The purpose of this mini-course is to develop students' abilities to apply game theory to managerial decision-making. The course emphasizes the application of game theory to improve students' ability to make and analyze strategic decisions. The course will emphasize application rather than theory. Game theory has become an important tool for managers, policy makers, consultants, and lawyers in implementing tactical as well as strategic actions. This course will primarily focus on examples useful for developing competitive strategy in the private sector (pricing and product strategy, capacity choices, contracting and negotiating, signaling and bluffing, takeover strategy, etc.). Game theory can also be used to address problems relevant to a firm's organizational strategy (e.g. internal incentives and information flow within a firm) and to a firm's non-market environment (e.g., strategic trade policies, litigation and regulation strategy).

Game theory provides an extremely useful perspective on competitive interaction, but quickly becomes unwieldy when applied "literally" to complex problems. Much of the art of applying game theory lies in identifying the essential factors and interactions in a complex situation, using game theory to improve your understanding of those interactions, and then developing intuition from the discipline provided by game-theoretic models. In addition to providing the student with a set of techniques from game theory, this course will try to impart some of the art of using game theory.

Prerequisites

It is expected that students have been introduced to some basic game theory. There will be a quick review of the basics and some recommended supplemental readings for those who have little or no background in game theory.

Materials

Managerial Economics: Theory, Applications, and Cases
By Allen, Doherty, Weigelt, and Mansfield
Course-pack from Study net

Grading

Written Analysis	40%
Problem Sets:	20%
In Class Exam	40%

Study Guide and Course Outline

September 5th Session 1 – Introduction to Games of Strategy

Strategic games, timing, information, players, strategies, and payoffs

Readings:

Making Game Theory work for Managers, McKinsey Quarterly
Games of Strategy: An Introduction (HBS # 9-187-159)
Game Theory and Business Strategy (9-705-471)
Managerial Economics, Chapter 11
Introduction to Competitive Dynamics: Strategy and Tactics (9-707-475)
Decision Trees (9-205-060)
Decision Trees for Decision Making

Questions:

See optional but recommended problem set on web café

September 10th: Session 2 Game Theoretic Examination of Ryan Air

Readings:

Dogfight over Europe: Ryan air (A) (HBS# 9-700-115), Ryan air (B) (HBS # 9-700-116)

September 12h: Session 3– Deep Pockets

Readings
Deep Pockets (9-190-101)

Questions for the Readings

1. As a potential entrant into the industry how do you assess the possible reaction of the incumbent firm to your entry? Do you expect to be accommodated?

** Assume that the entrant must show a profit by/in quarter 12*

September 17th: Repeated Games – Session 4

Readings**:**

Managerial Economics, Chapter 11

September 19th: Session 5- Fog of Business

Readings:

Fog of Business (5-795-169)

Questions:

1. Draw the game in extensive form. Begin with E1's decision whether to enter or not.
2. Determine the payoffs and Nash Equilibrium for the game
3. Should player E1 enter market 1?
4. Briefly discuss what assumptions are you making as what E1 believes- about the players' rationality, about what the players believe about one another's rationality, and so on?

September 24th: Session 6: Toy Game

Readings:

The Toy Game (HBS # 9-795-121)

Questions:

1. First suppose that neither Matchbox nor Hot Wheels gives out rebate coupons. What price or prices do you expect Matchbox and Hot Wheels cars to fetch?

2. Next suppose that Matchbox, but not Hot Wheels, gives out rebate coupons. What price or prices do you expect Matchbox and Hot Wheels cars to fetch now?

September 26th : Session 7 Judo and Art of Entry

Readings:

Judo Economics (9-794-103)

Questions for Judo Economics

1. Suppose that: (a) each buyer has a willingness-to-pay of $200 for one unit of either the incumbent's or the entrant's product; and (b) both incumbent and entrant have a $100 unit cost of serving buyers. Formulate a strategy for the entrant. How much money can the entrant make?

2. Now suppose that: (a) each buyer has a willingness-to-pay of $200 for one unit of the incumbent's product and $160 for one unit of the entrant's product, and (b) the incumbent has a $100 unit cost and the entrant a $120 unit cots. Formulate a strategy for the entrant. How much money can the entrant make?

3. Finally, suppose that: (a) each buyer has a willingness-to-pay of $200 for one unit of either the incumbent's or the entrant's product; and (b) the incumbent has a $120 unit cost and the entrant an $80 unit cost. Formulate a strategy for the entrant. How much money can the entrant make this time?

October 1st : Session 8 Sequential Entry

Readings**:**

Sequential Entry (9-190-102)

Questions**:**

1. How many firms will enter the industry?

2. How much will each firm spend on advertising?

3. What will be the firms' profits?

October 3rd Session 9 Product Differentiation
Readings

Competition and Product variety (9-190-100)
Product Proliferation and Preemption (9-190-117)

Questions

1. Which product types will managers at firms A and B decide to manufacture? State the logic underlying your beliefs?

2. Assume that firm A enters the market first. If A's managers wish to deter entry by B, which products should they produce and why?

3. Assume A has a monopoly position. What products should A's managers produce and why? Do A's managers want to serve the entire market?

Hint: Remember that the model is symmetric since demand is uniform. That is the prices

October 8th: Session 10 Mixed Strategies and Promotional Pricing

Readings:

Simultaneous Move Games with Mixed Strategies

October 10th Session 11: Signaling Information: Education and Quality

Readings : To be distributed in the prior class meeting

October 15th Session 12 Signaling and Information

Readings:

Signaling Costs (9-793-125)

1. Might player A want to try to signal its cost position to player B?
2. Is there a way for it to do so? In answering, pay particular attention to the question of the credibility of any signal that A might send B.

October 17th Session 13: In Class Exam

Instructions for Written Analysis:

The written analysis should be based on a strategic situation of your choice. Your chosen situation must be one where payoffs are interactive. That is the payoff to one player depends on the strategic choice of other players. The paper should develop a game/decision tree to depict the situation, and then use the tree to analyze the relevant strategies.

Your decision tree should show some of the following

Players
Strategic options
Order of moves (i.e., sequential or simultaneous)
Time period (i.e., one shot or repeated)
Information of the players (i.e., asymmetric, incomplete)
Payoffs

Your paper should also include the following

General background: 1-2 pages: You should provide some general description of the key players. You should also describe the strategic choices (e.g., price, market entry, new products, advertising) available to the players.

5-6 pages of analysis of strategic decisions made in light of your game tree

Suggested Paper Length including all exhibits: 6-8 pages, doubled spaced, 12 point font, One inch margin, header (team member names)

Team size: 3-5 students

Date Due: by 5pm, Monday, October 31st

One on one meeting:

Each team is strongly encouraged to have a brief one on one meeting with Professor Thomas. At least one week prior to the meeting, each team should submit electronically the following information

1. Brief outline of proposed topic

2. Brief description of your game/decision tree.

Payoffs:

It is not expected that teams obtain primary financial/performance data. In order to determine payoffs, any of the following are acceptable

1. Easily or readily obtained primary data (e.g., internet searches)
2. Algebraic Values
   Payoffs for a player/firm usually functions of price, variable costs, market share, and fixed costs. Thus best strategies are a function of these values.
3. Plausible values

Delivery Instructions: Students should post their papers to web café no later than the due date. Pdf format preferred.

Example of Prior paper topics. Some prior papers are also available on web café

Pre-nuptial Agreements

Labor v Management collective bargaining
NFL, NBA, MLB

Sporting Events
New England Patriots v Indianapolis Colts on 4th down, November 2009

Card/Board Games
Texas Hold' Em
Risk
Go

Reality TV shows
Survivor
Real Housewives
Ru Paul's Drag Race
Jersey Shore

Android entry in to smart phone market

India response to Pakistan orchestrated Mumbai attacks

Exploding Job Offers

Dating, Marriage, Divorce

ON line Auctions

Military Strategy
US Elections (Presidential, Party Primaries)

Problem Set Exercises

The completed exercises are due at the beginning of class. Exercises submitted after class has started will NOT be accepted.
The questions for each exercise are given in the course syllabus
Problem set exercises and due dates

Game Theory Exercises*	Session 2	September 5th
Deep Pockets	Session 3	September 12th
Fog of Business	Session 5	September 19th
Judo and Entry	Session 7	September 26th
Sequential Entry*	Session 8	October 1st
Signaling and Information*	Session 12	October 15th

"Game Theory Exercises" which should be completed individually is optional and will NOT be graded