Microeconomic Theory and Applied Microeconomics
Michaelmas Term 2002

Summary

This course consists of 6 tutorials and 2 classes. It is intended for those taking the Finals paper in Microeconomics. Along with attending tutorials, students must attend the University Lectures in Microeconomics Theory (Monday and Tuesday at 11:00) and in Applied Microeconomics (Wednesday and Thursday at 11:00). Both sets of lectures are held at the Gulbenkian.

Schedule

The subject schedule is as follows:

Week 1	Welfare Economics and Market Failure
Week 2	Public Goods and Externalities
Week 3	Pure Theory of International Trade
Week 4	Game Theory and Industrial Organization I
Week 5	Game Theory and Industrial Organization II
Week 6	Expected Utility
Week 7	Competition Policy (Class)
Week 8	Education and Training (Class)

On days that you have essays assigned, I would like for your essays to be handed in the prior afternoon by 4:00 p.m.

Questions

Whenever you have questions about anything to do with economics, please contact me. My college number is 79670 and my department number is 81296. My office is Staircase 5, room 1. My e-mail (which is the best way to contact me for questions that are easily answered) is **Kathryn.Graddy@exeter.ox.ac.uk**.

Welfare Economics and Market Failure

For this week's tutorial, please begin by reviewing Varian, *Intermediate Microeconomics*, chapters 29-31. Brown and Jackson then provide a nice transition to this year's tutorials and lectures. This year's readings, as listed below, are all very useful in answering the essay question. As you are reading, make sure you familiarize yourself well with the following topics:

general competitive equilibrium and the two fundamental theorems
the theory of the second best
optimal prices and taxes

Revision and Introduction:
Varian *Intermediate Microeconomics* chs 29-31
(or Katz and Rosen chs 11,12?)
Brown, C. and Jackson, P. *Public Sector Economics* chs 1 (pp 14-26) and 2.

Reading:
Y-K Ng, *Welfare Economics* Chs 1, 2, 3, 6, 9
R. W. Boadway and N. Bruce *Welfare Economics* Ch 4 esp. 4.4
Heady "Optimal taxation as a guide to tax policy", *Fiscal Studies*, February 1993
Sen A.K., "The profit motive", *Lloyds Bank Review*, 1983

Tutorial Discussion Question:
Outline reasons for the allocative and distributive roles of government and how government could address these roles (see Brown and Jackson).

Essay:
Are the Fundamental Theorems of Welfare Economics of any relevance to policy makers? What practical guidance is provided by theories of optimal taxation?

Public Goods and Externalities

For this week, please begin by reviewing Varian, chapters 32 and 35. As you are doing this week's reading, please take notes on and be prepared to discuss in the tutorial the following topics

pure theory of public goods
the revelation mechanism and Clark-Groves taxes
externalities
the Coase theorem

Revision:
Varian *Intermediate Microeconomics, 6th edition,* chs 33, 35 (chapters 32 and 35 in the 5th edition.

Books:
There are good theory chapters in many textbooks. Use at least two of:
Y-K. Ng *Welfare Economics* chs 7,8
Boadway R., Bruce N., *Welfare Economics*, ch 4
Varian *Microeconomic Analysis, 3rd edition,* chs 23, 24

For a more comprehensive treatment, and reference:
Cornes R., Sandler T., *The Theory of Externalities, Public Goods and Club Goods*

Articles:
J. Farrell "Information and the Coase Theorem" *Journal of Economic Perspectives*, 1987
Newbery D., 'Missing markets: consequences and remedies', in Hahn F., ed, *The Economics of Missing Markets, Information and Games*, 1989

Preparation for the Tutoiral

- Prepare an answer to one of the following questions, for presentation during the tutorial:

  1. Why is it difficult to decide how much of a public good should be provided and who should pay for it? Why cannot these two aspects be separated?

  2. Is bargaining the best solution for externality problems?

- Think about this question for discussion:

  What considerations determine the efficient levels of (a) smoking and (b) immunization against infectious diseases? Is it practical to achieve these?

- Work through the following three problems:

1. Consider an economy with n individuals, labelled {1,2,…,n}. The government wishes to know whether it ought to build a bridge. Individuals differ in their valuations of the bridge depending on how far they live from it. A particular individual i gets utility u_i if the bridge is built. Otherwise they get nothing.

i. Suppose the cost of building the bridge is c. When should the government build the bridge?

ii. Suppose each individual is asked to pay a fixed and commonly known share of the cost of building the bridge, s_i such that $\Sigma_{i=1,n} s_i=1$. Write down the net valuations of the agents, v_i, in terms of u_i, s_i, and c. When will a typical agent wish the bridge to be built? In terms of v_i rewrite the governement's decision problem.

iii. Unfortunately, the government does not know any of the valuations, u_i and hence does not know v_i. In an effort to discover v_i for each agent, the government asks each agent to report their net valuations. Call the reports they give b_i. Supppose agent 1 has $v_1>0$. What will agent 1 report, i.e. what is the value of b_1? What is the problem with that?

iv. How might the government induce all agents to tell the truth?

2. Consider an economy situated by the ocean. Fishing is the main industry, and all the agents work as fishermen. To do this they need to buy a boat at a cost of c. If the number of boats on the ocean is b, then the total value of the fish caught is f(b). Suppose that, the more boats there are at sea, the less any individual gets. Assume each fisherman catches an equal number of fish (because the boats are the same size).

i. What is the value of the fish any particular fisherman takes home?

ii. Suppose there are b boats at sea at the moment. Another agent is considering whether to buy a boat and go fishing. Write down an equation that governs this agent's behaviour. Hence find an equation for b, the number of boats that will be at sea in equilibrium.

iii. The government wishes to maximise the total wealth in this economy. Write down the maximisation problem it faces. Hence write down an equation for b*, the socially efficient number of boats at sea. Is this bigger or smaller than b? What could the government do to ensure that total wealth is maximized and hence there is no under or over fishing?

3. Please read through example attached to end of reading list and work through attached problem.

Theory of International Trade

Reading: Please read Krugman and Obstfeld, Chapters 2-5 and 9-12. Pay particularly good attention to chapters 2-5. Be prepared to discuss in class in detail the following models of International Trade:

1. The Ricardian Model
2. The Specific Factors Model
3. The Heckscher-Ohlin Model

Also, please read Krugman "The Accidental Theorist," pages 73-95.

Essay

Please answer one of the following essay questions:

1. Capitalists and workers in any given industry can be expected to oppose each other on the issue of free trade (or protection) for that industry. Do you agree?
2. "Free Trade leads to a Paretian Optimum." "Free Trade leads to unacceptable inequalities." Discuss.
3. "The only valid argument for a tariff is the optimum tariff argument. All other arguments are arguments for subsidies." Discuss.

Game Theory and Industrial Organization I

For this week's tutorial, you should first review Kreps, chapter 10.1 (on Bertrand, Cournot, and Stakelberg equilibria). You should then take good notes on the topics below:

Definition of a Game
Nash Equilibrium
Pure and Mixed Strategies
Dominance and Iterated Dominance
Normal and Extensive Form Games
Subgame Perfect Equilibrium
Repeated Games and Discounting
The Folk Theorem
Finitely and Infinitely Repeated Games
The Chain Store "Paradox"

Review:

Kreps Chapter 10.1

Reading:
The primary goal in the readings is to understand each of the above topics. Two suggestions on texts that you can use are:

Gibbons, *A Primer in Game Theory*, Chapters 1 and 2
Kreps, *Microeconomic Theory* 10, 11, 12, and 14
Rasmussen (second edition) Section 14.3 (on the Chain Store Paradox Kreps and Wilson, *JET* 1982)

In addition, please read
Green, E. and R. Porter, Econometrica, Vol. 52, No. 1 (January 1984)
This is a very readable article.

Problems:

1. What is the definition of a Nash equilibrium?
2. Please write down a simple numerical or algebraic example and calculate the Nash equilibrium of the following games
    a. The Prinsoners' Delimma (do not use the example below!)
    b. Cournot Duopoly
    c. Bertrand Duopoly

3. Solve the following two games by strict dominance (hint: in the second game, need strict dominance by a combination:

	T1	T2	T3
S1	4,3	2,7	0,4
S2	5,5	5,-1	-4,-2

	T1	T2	T3
S1	4,10	3,0	1,3
S2	0,0	2,10	10,3

4. Use the following game to show why successive weak dominance is controversial:

	T1	T2	T3
S1	10,0	5,1	4,-200
S2	10,100	5,0	0,-100

5. Find a mixed strategy equilibrium to the following games:

	T1	T2
S1	1,-1	-1,1
S2	-1,1	1,-1

	T1	T2
S1	3,1	1,3
S2	0,5	4,2

6. Draw an example of an extensive form game with two Nash equilibria, one of which is not a subgame perfect Nash equilibrium.

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a.Consider a simple Prisoners' Dilemma

	C	D
C	3,3	1,4
D	4,1	2,2

where C is the pure strategy "cooperate" and D is the pure strategy "defect." Player 1 plays rows and receives the payoff in the bottom left of each box, player 2 plays columns and receives the payoff in the top right hand corner of each box. What is the unique Nash equilibrium?

b. Suppose the game is repeated N times. Players have identical discount factors d. Find a Nash equilibrium of this repeated game. Are there any others? If not, why not? If there are, write them down.

c. Suppose the game is repeated infinitely many times, players still have identical discount factors d. What do the folk theorems tell us about the Nash equilibria in this situation? How about subgame perfect equilibria?

d. Show that, in the infinitely repeated game with discount factors d, the following trigger strategies constitute a Nash equilibrium: player 1 plays C in period 1 and continues to do so until player 2 plays D, in which case player 1 switches to D forever. Player 2 plays C in period

1 and continues to do so until player 1 plays D, in which case player 2 switches to D forever.

e. How large does d need to be for the trigger strategies of question 4 to constitute a Nash equilibrium? What happens in such and equilibrium? What payoffs do the players receive?

f. Referring to the Cournot and Bertrand duopoly games, what does this tell us about collusion? When is collusion likely?

8. Be prepared in class to describe the Green and Porter model and state why it is so important. Does this model infer that collusion is more or less likely to occur in booms or in busts?

Game Theory and Industrial Organization II

Please use the lecture notes on Game Theory and IO – Entry as a starting point. Please supplement these notes with the following readings. Be prepared to discuss the models in your lecture notes during the tutorial.

Vickers, "Strategic Competition among the Few", *Oxford Review of Economic Policy*, Autumn 1985
Dixit "Recent Developments in Oligopoly Theory" *American Economic Review*, May 1982.
Baumol, W. "Contestable markets: an uprising in the theory of industry structure. " *American Economic Review*. 72: 1-15.
J. Tirole *The theory of Industrial Organisation*, Section 8.2.1 and 8.2.2 (on Dixit, *EJ*, 1980) and Section 9.4 (on MIlgrom and Roberts JET 1982)

For understanding the section of the notes on business strategies, I would suggest a combination of the following readings:

Fudenberg, D. and Tirole, J. 1984. The fat-cat effect, the puppy-dog ploy, and the lean and hungry look. *American Economic Review*, Papers and Proceedings 74: 361-66.
Tirole, Theory of Industrial Organization, Chapter 9, pages 326-329.
Bulow, Geanakopolos, and Klemperer. 1985. Multimarket Oligopoly: Strategic Substitutes and Complements, *Journal of Political Economy*, p. 488-511.

Essay: Is capacity a more satisfactory instrument of entry deterrence than price? Under what circumstances should the setting of a low price by an incumbent firm be regarded as socially undesirable?

Expected Utility, Risk and Uncertainty

During your reading, please focus on the following topics:

decision-taking under uncertainty
the Expected Utility Hypothesis and its critics;
attitudes towards risk
market allocation of risk and uncertainty

Introduction
Katz and Rosen ch 6 as recommended on the Department list is good but a better choice is
Varian *Intermediate Microeconomics* ch 12
and/or
Layard, R. and Walters, A. *Microeconomic Theory* Section 13.1

Core reading:
The following books cover similar ground in different ways. Focus on one; use at least two:

J. Hirshleifer and J. G. Riley *The Analytics of Uncertainty and Information* ch 1.
Hargreaves Heap, S., et al *The Theory of Choice: A Critical Guide* (Blackwell 1992) chs 1, 3
Kreps ch 3 (some parts quite formal and hard, but try to get hold of the ideas and follow the discussion, even if you skip some of the detail – such as the proof of Proposition 3.1)

On market allocation: Layard, R. and Walters, A. *Microeconomic Theory* Section 13.2

Critiques and Discussion:
M. Machina "Choice under uncertainty: problems resolved and unresolved", *Journal of Economic Perspectives*, Summer 1987
P. Schoemaker "The Expected Utility Model", *Journal of Economic Literature*, 1982

Preparation for the Tutorial

Please write a clear and concise answer to question 1 (about one side), to be handed in prior to the tutorial. Everyone should do question 2: be prepared to draw your utility function on the board and explain how you found it. Each person should bring short answers to two or three other questions, for circulation and explanation to the class.

1. What *is* "Expected Utility Theory"?

2. Suppose you are offered a gamble (£x, £y; 0.5) - that is you get £x or £y, with probability 0.5. What would be your certainty equivalent (CE) for the gamble if x=0 and y=1000? Call this amount c. Now write down your CEs for each of the

gambles (0, £*c*; 0.5) and (£*c*, £1000; 0.5). Use this information to plot the shape of your utility function. (You need to think carefully about your CEs - what would you choose if you were *really* offered these gambles. See Kreps 3.6 for discussion of this kind of exercise.)

3. What do we learn from (a) the Allais Paradox; (b) the Ellsberg Paradox? Do these paradoxes, or any other evidence, lead you to doubt the validity of EU theory?

4. Is there a difference between risk and uncertainty?

5. Why do some people both gamble and insure?

6. What alternatives or modifications to Expected Utility maximisation have been suggested? Are they convincing?

7. Should people become more or less risk-averse when they get richer?

8. In what ways can a market system be said to allocate risk efficiently?

Competition Policy
(Class)

A good understanding of the applied topic on competition policy requires a fair amount of reading and assimilating material. I suggest that you carefully go through your lecture notes and the articles that are assigned on the course reading list (with the exception of the cases- see below) and take notes on the following topics:

I. Objectives of Competition Policy
   a. UK
   b. EU
   c. US

II Main issues in Competition Policy
   a. Anti-competitive agreements
      i. Tradeoffs
      ii Legal approaches in the UK, EU, US
   b. Abuse of dominant positions
      i.. Tradeoffs
      ii. Legal approaches in the UK, EU, US
   c. Mergers
      i. Tradeoffs
      ii. Legal approaches in the UK, EU, US

III Understanding Market Definition
   a. The SSNIP Test

Assignment:
First, make sure that you take good notes following the above outline. You may be asked about any of the above subjects during the class. Second, I would like you to work in pairs, with each pair choosing either a., b., or c. below. (Each pair should choose a different topic). I would like each pair to present their cases to the class and answer the question associated with each topic. In addition, I would like each pair to produce a short synopsis of the important features of the case (1-2 pages maximum), and bring copies to be distributed to the class.

a. White Salt
   Electricity Generation
   What was the UK policy regarding collusion and how was it applied in these cases? Would US or EU policy have been different?
b. Microsoft
   What was the US policy regarding tying and predation in this case? Would US or EU policy have been different?
c. Volvo-Scania
   What was the EU policy regarding mergers in this case? Would US or EU policy l have been different?

Education and Training

Class to be held with Dr. Margaret Stevens, Lincoln Colleg