ECO540J1
Seminar Programme, 2007-08

Seminar 1
Introduction to Course

Seminar 2
1. Suppose you have to pay $2 to enter a competition. The prize is $19 and the probability of winning is 1/3. You have a utility function u(x)=log x and your current wealth is $10.

1. What is the certainty equivalent of this competition?
2. What is the risk premium?
3. Should you enter the competition?

2 . You are sending a package worth $10,000. There is a 0.1 percent chance that the goods will be destroyed or lost in transit. An insurance company offers you insurance against this eventuality for a premium of $15. If you are risk neutral, should you buy this insurance?

3. John has assets of $1 million. Of this amount, $250,000 is perfectly safe (say, a bank deposit). The remaining $750,000 is his equity in his house. If the house burns down (with probability=0.05) he loses this amount. He can insure his house against this contingency by paying an insurance company a premium of $40000. Then if his house does burn down, the insurance company will pay him $750,000.

(i) What is the expected net earnings to the insurance company from this policy?
(ii) Would John buy this policy if he was *risk neutral*?
(iii) If John's utility function was $u(x) = \sqrt{x}$, where x represents his total assets, would he buy the insurance policy?

Suppose John can buy partial insurance. This works as follows: John can choose a number α, where: $0 \le a \le 1$. Then, he has to pay a premium $\alpha \times 40,000$ to the insurance company and, if the house burns down, the insurance company will payout $\alpha \times 750,000$. Under these circumstances, what level of insurance would John select?

Seminar 3

1. Persons A and B, respectively, have utility functions $-e^{-0.00001c}$ and $-e^{-0.00002c}$ and they are each faced with the gambles: X=(0.4: \$40000; 0.6: -\$10000) and Y=(0.33: \$21000; 0.33: \$9000; 0.33: -\$9000). Compute the Certainty Equivalent and the Risk Premium for A and B for each of the gambles X and Y and show that B is more risk-averse than A.

2. Jill, whose utility function is $u(z) = 12.5859 - 7.4267e^{-0.0000211z}$, is offered a gamble: (0.5: \$50,000; 0.5: -\$25,000).

(a) Will she take this gamble if her alternative is the certainty of \$0?

She prints 100 shares in the gamble, each share representing the gamble: (0.5: \$500; 0.5: -\$250), and offers each of 100 friends - all of whom have the same utility function as Jill - a share for \$100. Will she get any takers on her offer?

Seminar 4

Some Calculus

Seminar 5

Bayes' Theorem with application to adverse selection (http://www.borooah.com/Teaching/Microeconomics/Bayes.pdf**)**

Seminar 6

A worker's productivity is θ where θ can take the value θ_1 or θ_2, $\theta_1<\theta_2$. The benefit to the firm of a worker's services is proportional to z, the amount of education an employee received. The cost of obtaining z years education is: $C(z,\theta) = ze^{-\theta}$. The worker's utility function is: $U(y,z)= -e^{-y} - C(z,\theta)$, where y is the payment received. The risk-neutral firm designs contracts, contingent on the observed gross benefit, to maximise its expected profits.

If the firm knows the worker's type, what contracts will be offered? If it does not know the worker type, which type will self-select the "wrong" contract?

Seminar 7

1. John Smith is an enterprising student who is always trying to make a buck. He decides to sell grade insurance to his fellow students. He will pay $500 to any student policyholder who gets an F. Because only 2% of all grades are Fs, John computes that he can break even if he charges students $10 per class. To make a profit, he decides to charge $15.
a) Is his arithmetic correct in computing the break-even point?
b) Will he face a free rider problem? Explain.
c) Will he face an adverse selection problem? Explain.
d) Will he have a problem with moral hazard? Explain.

2. In Britain women who bear a child outside marriage have a 'right' to a subsidized council home." The type of problem an economist will look for in this 'right' is that of:
A. Adverse selection.
B. Free riding.
C. Moral hazard.

3. Deposits at U.S. banks are insured by the FDIC, the Federal Deposit Insurance Corporation. In New Zealand, there is no deposit insurance. A government official there explained that deposit insurance "may actually increase the risks of bank failures in the first instance." Since the taxpayer is bearing some of the risk of bank failure, depositors and bank managers can take bigger financial risks. What term do economists use for this increased risk?
A. Speculation
B. Adverse selection
C. Rational ignorance
D. Moral hazard

4. In Britain, virtually all blood used in transfusions is donated. In the United States, much is purchased. Typical sellers include college students, slum dwellers, and drug addicts--all groups that can use the extra cash. The United States has had a much harder time keeping its blood supply free of infectious disease than has had Britain. Why?

5. Why is there no private insurance for unemployment?

6. There is no market that insures against mentally or physically handicapped babies. Yet when people have children, there is a significant risk that they will have a child with such a handicap. How can you explain this gap in insurance coverage?

Seminar 8

1. In a two-commodity exchange economy there are two groups of people, *A* and *B*. Group *A* has an endowment of 30 units of commodity 1 and *k* units of commodity 1 and group *B* has an endowment of 60 units of commodity 1 and 210−*k* units of commodity 2; group *A* has the utility function $U^A = 2\log(x_1^A) + \log(x_2^A)$ and group *B* has the utility function $U^B = \log(x_1^B) + 2\log(x_2^B)$.

(i) Show that the equilibrium price, *p*, of commodity 1 in terms of 2 is (210+*k*)/150.

(ii) What are the group incomes y^A and y^B in equilibrium, as a function of k?

(iii) Suppose it is possible for the government to carry out transfers of commodity 2 between *A* and *B* by varying *k*. Show the set of income distributions that can be achieved through such transfers.

2. Derive the Samuelson condition for the optimal pricing of public goods using the method of Lagrange multipliers.

Seminar 9

1. The social loss due to monopoly can be measured by the area under the Harberberger triangle.

2. It is known that in a certain industry monopoly profits Π are available. There are N firms that are lobbying to get the rights to run this monopoly. Firm *f* spends an amount C^f on lobbying. The probability that firm *f* is successful is: $p^f = \dfrac{C^f}{\sum_{j=1}^{N} C^j}$

(i) Suppose firm *f* chooses C^f so as to maximise expected returns to lobbying, assuming that the lobbying expenditure of the other firms is given. What is the first order condition for a maximum?

(ii) If the firms are identical show that the total lobbying costs chosen by the firms is given by:

$$NC^* = \Pi\left(1 - \frac{1}{N}\right)$$

If lobbying costs contribute nothing to society, what is the implication of the measurement of "waste" due to monopoly?

Seminar 10

Revision

Background

The Expected Utility Rule for Evaluating Gambles

Suppose that a person is faced with a choice between two gambles: $X = (p_G^X, p_B^X, c_G^X, c_B^X)$ and $Y = (p_G^Y, p_B^Y, c_G^Y, c_B^Y)$, with expected utilities: $EU^X = p_G^X \times c_G^X + p_B^X \times c_B^X$ and $EU^Y = p_G^Y \times c_G^Y + p_B^Y \times c_B^Y$. Then he/she chooses between the gambles by comparing their expected utilities: X is chosen over Y if, and only if, $EU^X > EU^Y$ and Y is chosen over X if and only if $EU^Y > EU^X$ with indifference between X and Y being defined by $EU^Y = EU^X$.

The ***certainty equivalent*** of a gamble, $X = (p_G^X, p_B^X, c_G^X, c_B^X)$, is defined as the sum of money \$CE which, *if received with certainty*, would cause the person to be *indifferent* between accepting and rejecting the gamble: $u(CE) = EU^X$.

The ***risk premium*** associated with a gamble is the *maximum* amount a person is prepared to pay to avoid a risky situation and is given by: ER-CE. Since, *under risk aversion*, CE<ER , the risk premium associated with a gamble is greater for persons with high risk aversion.