Microeconomics
Part I, Paper 1
Consumer and Producer Theory; Rational Choice
Michaelmas Term 2016

Supervision set 1

(To be completed after Lecture 5)

Suggested reading:

1. Varian, *Intermediate Microceonomics*, Chapters 2, 3, 4, 5.
2. Rodrik, *Economics Rules*, Introduction, Chapters 1, 2.
3. Morgan, Katz & Rosen, Chapter 2.

Question 1.

Andy returns home and discovers that he has locked himself out of his flat. He wants to get into the house, and is deciding what to do. Each action available to Andy can lead to an outcome that entails Andy either remaining in the street or getting inside, damaging the house or not, and injuring himself or not. An example of an outcome is: (Andy in the street, the house is undamaged, and Andy has injured himself). An example of (one of many) actions that could lead to this outcome is trying to climb through the chimney.

(i) Propose a plausible ranking of Andy's preferences over the possible outcomes.

(ii) What do economists have to say about the way that Andy might behave in this situation?

(iii) Later you learn that Andy ended up climbing into the house through the first floor window, without damaging the house or injuring himself. You are now told that when Mike found himself in a similar situation he chose to call the locksmith, who opened the door without damaging it. Can you suggest why Andy and Mike behaved differently? What does this difference in their behaviour imply about their preferences over outcomes?

Question 2.

(i) Suppose that an individual faces finitely many alternatives. What assumptions do we need to make about her preferences over these alternatives to be able to represent her preferences with a utility function? Explain why each assumption is necessary. When her preferences satisfy these assumptions, suggest a way to construct a utility function to represent those preferences.

(ii) Pep has a number of offers from several football clubs to become their manager. When choosing between any two clubs, Pep prefers to manage club x rather than club y if x beat y in the last football match between x and y. When does this criterion lead to a complete preference relation over football clubs? Can his preferences be represented by a utility function? If yes, explain how. If not, explain why not.

(iii) Can two different utility functions represent the same preferences? Can a utility function represent two different preference rankings? Explain your answer.

(iv) Suppose, now, that the number of alternatives faced by the consumer is not finite. If her preferences satisfy the assumptions you identify in part (i), is it still possible to represent her preferences with a utility function?

Question 3.

Gordon's utility function is $u(x_1, x_2) = x_1^{1/3} x_2^{2/3}$. He has an income of 180 and faces prices $p_1 = 3$ and $p_2 = 1$.

(i) Depict Gordon's preferences on a two dimensional diagram with x_1 on the horizontal and x_2 on the vertical axis.

(ii) Write down the equation for Gordon's budget constraint. Draw it on the diagram.

(iii) How much does Gordon buy of each good and what is his achieved utility level? Illustrate your answer with a diagram.

Question 4.

(i) Consider two bundles A and B. Bundle A contains 4 apples and bundle B contains 4 bananas. The marginal utility of an additional apple when consuming bundle A is higher than the marginal utility of an additional banana when consuming bundle B. Does this imply that the individual prefers A to B? Discuss.

(ii) Suppose that Jane's preferences over bundles of apples and bananas can be represented by the utility function

$$u(x, y) = x^{\alpha} y^{\beta},$$

where the bundle (x, y) contains x apples and y bananas (and α and β are positive constants).

(a) If u exhibits diminishing marginal utility for apples, what do we know about α? If u exhibits increasing marginal utility for bananas, what do we know about β?

(b) Now, consider Tarzan whose preferences over bundles of apples and bananas can be represented by the utility function

$$v(x, y) = \alpha \ln x + \beta \ln y.$$

What can you say about the marginal utility for apples and marginal utility for bananas? Are they decreasing, increasing, neither?

(c) What is the difference between Jane and Tarzan in terms of their preferences over apples and bananas? What is the meaning of marginal utility?

(d) What is Jane's marginal rate of substitution between apples and bananas if she has x apples and y bananas? What is Tarzan's marginal rate of substitution between apples and bananas if he has x apples and y bananas? What is the meaning of marginal rate of substitution?

Question 5

Suppose that Jane has £100 available each month for recreational activities, including exercise, movies, etc. Initially, her health club simply charged £4 per hour, with no membership fee, and Jane used the facility for 10 hours per month. Now the club decides to alter its pricing policy and charge a membership fee of £30 per month, but a lower hourly fee of £1 per hour. Of course, Jane also has the option not to use the health club at all. Use a revealed preference argument to answer the following question: Does this new arrangement make Jane better off or worse off, compared to the old pricing structure?

Question 6 (2012 tripos)

Suppose that utility is given by

$$u(x, y) = x + 16\sqrt{y}$$

where x is the quantity of good X consumed, and y is the quantity of good Y consumed. The price of good X is $p_x = 1$ and the price of good Y is $p_y = 2$.

(i) How much of each good will the individual consume if her budget is 10? (Hint: remember that you cannot consume a negative amount of a good).

(ii) How much will she consume if her budget is 20?

(iii) Briefly comment on your result.

Question 7.

Some economists take pride in *using* formal models. Others take pride in *not using* formal models. What are the advantages of using formal models? What are the advantages of avoiding formal models? Discuss.