Written Exam for the B.Sc. in Economics summer 2011

Microeconomics A

Final Exam

7. June 2011

(3-hour closed book exam)

Please note that the language used in your exam paper must correspond to the language of the title for which you registered during exam registration. I.e. if you registered for the English title of the course, you must write your exam paper in English. Likewise, if you registered for the Danish title of the course or if you registered for the English title which was followed by “eksamen på dansk” in brackets, you must write your exam paper in Danish.

If you are in doubt about which title you registered for, please see the print of your exam registration from the students’ self-service system.

Question 1
In many text books, Consumer's surplus is defined as the area under the ordinary demand curve. Nechyba uses the area under the marginal willingness to pay curve as the Consumer' surplus measure.

a) Let a consumer have a Cobb-Douglas utility function defined over two consumer goods. Consider a price increase in good 1 from p_1^0 to p_1^1. Calculate the two different measures of Consumer's surplus
b) Let another consumer have a quasi-linear utility function defined over two consumer goods (linear in good 2). Consider a price increase in good 1 from p_1^0 to p_1^1. Calculate the two different measures of Consumer's surplus.
c) Discuss the differences between the measures in sub-question a) and b) and explain why this difference arises.

Answer

a) First we must find the demand function and the compensated demand function (the marginal willingness to pay curve). Having found these we must calculate the area under the two curves (functions) as the integrals.
b) When the utility is quasi-linear then the MWTP curveand the ordinary demand curves are identical and we would therefore find that the two measures are the same. Again we need to find the demand curve in order to find it.
c) The main point to be made is the one used in b),namely that when there is no income effect, then the consumer's surplus measured under the ordinary demand curve and the compensated demand curves are identical. A diagram illustrating this can be helpful. An argument showing that the compensated demand is the same as the ordinary demand for quasi-linear utility functions is also satisfactory.

Question 2
Comment on the statement:
For decreases in wage taxes, substitution effects put negative pressure on tax revenues while wealth effects put positive pressure on tax revenues.

Answer
The statement is false. Decreases in wage taxes cause increases in after-tax wages -- and increases in wages cause substitution effects that cause increases in work hours. If people work more, then this causes upward pressure on tax revenue, not negative pressure. At the same time, the wealth effect from higher wages suggests people will work less (assuming leisure is a normal good) -- pushing in the opposite direction.

Question 3
Comment on the following:
The second welfare theorem says that we can get any efficient allocation to be an equilibrium allocation. If endowments are inequitably distributed in an economy, we can therefore redistribute among people and still get an efficient outcome. As a result, there is no policy trade-off between equity and efficiency.

Answer:

The statement accurately summarizes the second welfare theorem -- except that it neglects to state that the redistribution has to be of the "lump sum" kind in order for no efficiency loss to emerge from redistributive taxation. Since governments typically cannot redistribute in a lump sum way, the trade-off between equity and efficiency does emerge if we consider the initial distribution of endowments to be inequitable.

Question 4
Suppose we live in an exchange economy with two goods. I own 50 of both goods, and you own 250 of both goods. My tastes are captured by the utility function $u(x_1, x_2) = x_2 + 50\ln x_1$ and yours are captured by the utility function $u(x_1, x_2) = x_2 + 100\ln x_1$.

a) Calculate the competitive equilibrium price.
b) How much do each of us consume of good 1 in equilibrium?
c) Suppose the government transfers 100 units of your good 1 endowment to me. How is your answer to (a) and (b) affected?
d) Suppose the government instead transfers 100 units of good 2 from you to me. How is your answer to (a) and (b) affected?
e) Do you think your answers to (c) and (d) generally hold for most types of tastes -- or do you think they arise because of some specific feature of these tastes?

Answers
a) We can let the price of good 2 be equal to 1 and calculate the price ratio by simply calculating the price *p* of good 1. Solving the usual optimization problem for me, we get my demand for good 1 as $x_1^1(p) = \frac{50}{p}$. Doing the same for you gives us your demand as $x_2^1(p) = \frac{100}{p}$. Adding them and setting them equal to the economy's endowment of good 1 (which is 300), we get the equilibrium price p^*=0.5.

b) Plugging this price back into the demand functions from part (a), we get my consumption as 100 and yours as 200.

c) The demand functions for good 1 are independent of the endowments -- thus nothing would be different in terms of good 1 consumption.

d) The same answer as (c).

e) The result is due to the quasilinearity of good 1 -- which makes demands for good 1 independent of endowments. As a result, there is no wealth effect relative to good 1 -- and redistributions of endowments do not change the equilibrium prices or quantities.

Question 5
Explain under which conditions consumption of a good will increase if the price of the good increases. Can this ever happen for a *normal* good? Why/Why not?

Answer:
The first case is the Giffen good. Such a good is a very inferior good, for which the income effect is negative. Looking at the Slutsky equation, we can see that in order for an inferior good to be a Giffen good, the income effect must be larger (in numerical terms) than the substitution effect. We

may also see this phenomenon for normal goods, but this requires that we have an endowment of the good and that the 'endowment income effect' is large enough to outweigh the ordinary income effect and the substitution effect.