Written Exam for the B.Sc. in Economics summer 2012

Microeconomics A

Final Exam

31. May 2012

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.

The paper must be uploaded as <u>one PDF document</u> (including the standard cover and the appendices). The PDF document must be named with exam number only (e.g. '1234.pdf') and uploaded to Absalon.

Focus on Exam Cheating

In case of presumed exam cheating, which is observed by either the examination registration of the respective study programmes, the invigilation or the course lecturer, the Head of Studies will make a preliminary inquiry into the matter, requesting a statement from the course lecturer and possibly the invigilation, too. Furthermore, the Head of Studies will interview the student. If the Head of Studies finds that there are reasonable grounds to suspect exam cheating, the issue will be reported to the Rector. In the course of the study and during examinations, the student is expected to conform to the rules and regulations governing academic integrity. Academic dishonesty includes falsification, plagiarism, failure to disclose information, and any other kind of misrepresentation of the student's own performance and results or assisting another student herewith. For example failure to indicate sources in written assignments is regarded as failure to disclose information. Attempts to cheat at examinations are dealt with in the same manner as exam cheating which has been carried through. In case of exam cheating, the following sanctions may be imposed by the Rector:

- 1. A warning
- 2. Expulsion from the examination
- 3. Suspension from the University for at limited period or permanent expulsion.

The Faculty of Social Sciences
The Study and Examination Office
October 2006

Question 1

Consider two consumers George and Bridget. George's preferences can be represented by the utility function $u(x_{1G}, x_{2G}) = (\alpha \ln(x)_{1G}) + (1-\alpha)\ln(x)_{2G})$ Bridget's preferences can be represented by the utility function $(x_{1B}, x_{2B}) = a * ln(x_{1B}) + x_{1B}$. The prices on the two goods in this economy are (2/3; 2/3), and income for both is 250.

a) Assume that α=1/3, ρ=1/2 and *a*=1/2. Find the demand for George and Bridget
b) Assume again that α=1/3, ρ=1/2 and *a*=1/2. Consider an income change from 250 to 500. What changes in demand do we find for Bridget and George? Explain why there is a difference in these changes - of course this is due to the differences in preferences, but your answer should go a step beyond this.
c) Find the income and substitution elasticities for demand for good 1 when price changes in good 1

Answers

a) George's utility is a CD function. This gives us a demand equal to $x_1G = ((I/p_1)^1 = 125$ *and* $x_{2G} = \left(\frac{(1-()I}{p_2}\right) = 250$,

For Bridget we have a quasi-linear utility function with demand $x_{1B} = \frac{ap_2}{p_1} = \frac{1}{2}$ *and* $x_{2B} = \frac{I}{p_2} - a$ *=374.5*

b) The demand changes are different due to the preferences, but the main aspects are of course the various impacts through substitution and income elasticities, but naturally Bridget's preferences do not have an income effect, which is why there is no change in the demand. It is possible to find the changes by insertion

c) The income elasticity is 0 for Bridget due to the quasi-linear preferences, the substitution elasticity is -1/a. The CD function has substitution elasticity α and income elasticity

Question 2

Jeff's preferences over leisure, *l*, and a general consumer good, *c*, can be represented by the utility function $u(l, c) = l * (c + 1)$. He has *L* hours available every week and he can earn a wage *w* per hour supplied on the labour market.

Suppose that the government introduces an income tax *t* (that reduces the wage per hour by the tax rate). What compensation in income should our consumer have to be as well of as in the situation without the tax. Explain/show how this compensation can be found. You should use the Hicks compensation in your explanation.

Answer:

The approach is like in the following, but it may also be explained in words using diagrams.

Assume that p=1. Demand functions are $-\frac{wL+1}{2w}$, *and* $c - \frac{wL-1}{2}$ *. The tax decreases the price on leisure, but also decreases after tax income.* $u^0 = \frac{(wL+1)^2}{4w}$ *So to find the compensation we need to find the minimum income after the introduction of the tax, such that* $u=u^0$. *This gives us*

$= \frac{wL+1}{2w^{\frac{1}{2}}(w^{[]}-t)^{\frac{1}{2}}}, and\ c = \frac{(w-t)^{\frac{1}{2}}(wL+1)-w^{\frac{1}{2}}}{w^{\frac{1}{2}}}$ *. The costs are found by multiplying by the new prices (w-t, 1) and then deduct the original income of wL*

Question 3

Comment on the statement:

The slope of the marginal willingness to pay curve (which is the same as the compensated demand curve) is always steeper than the ordinary demand curve because the income effect adds to the change in demand following a price change.

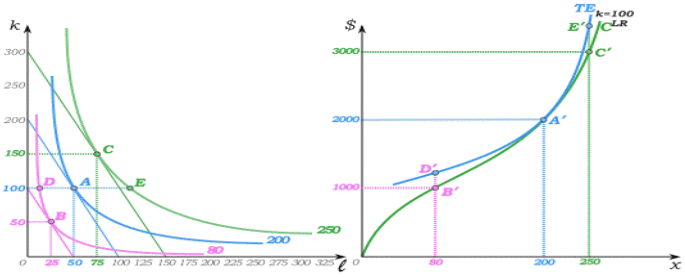
Answer:

The statement is false. It is true for normal goods, but when goods are inferior, then the income effect of a price change is opposite the price change and hence will tend to decrease the slope of the MWTP curve.

Question 4

True or false: *long run costs curves are always below short run costs curves*

Answer: True. In the long run it is possible to adjust for inefficient levels of fixed input factors. This should be accompanied by diagrams or other arguments similar to this.



Question 5

Consider an economy with the consumer Ron with preferences over two goods represented by the utility function $u(x_1, x_2) = x_1 x_2$ In the same economy we also have the firm Robin inc., which produces a consumer good (let this be good 1) from the other good in the economy (good 2) using a production function $f(q) = q^{a_B}$. Robin Inc. is owned by Ron.

a) What type of economy is this? What is the crucial assumption that must be made for such an economy to be interesting as a tool of analysis? Describe the consumer preferences and the production technology.

b) Let Ron have an endowment of *e* of good 2 and nothing of good 1. Find the equilibrium price for this economy

Answers:

a) This is a Koopmans/Robinson Crusoe Economy. The crucial assumption is that Ron behaves as a price taking consumer without considering his control over the firm; and that the behavior of Robin Inc. is made without taking the ownership into account. The preferences are Cobb-Douglas, which means that they are nice behaving (convex, continuous,

monotone). We would expect that good 2 is a good where Ron has an endowment that he can sell to the firm. The production function exhibits decreasing returns to scale which is also the general assumption made about production technologies.

b) *The profit maximizing production of the firm is found as* $q=p^2/(4w^2)$*. This gives rise to a profit of* $p^2/(4w)$*, which is inserted into the budget of Ron. Then maximize Ron's utility given the budget. His demand for the two goods are* $x_1=w/(2p)*e+p/(8w)$ *and* $x_2=0.5*e+p^2/(8w^2)$*. To find the equilibrium we need that output of the firm is equal to the demand from the consumer and that supply of the input factor is equal to the firms demand for this good. Due to Walras' law we can find the equilibrium of one of these two markets. We can assume that p=1, which makes the calculations easier (we are only interested in the relative price). Solving the equation for the relative price we find the equilibrium.*

Question 6

Comment on the statement:

As long as both current and future consumption are normal goods, a decrease in the interest rate will result in a drop in savings.

Answer

False. A decrease in the interest rate will cause a substitution effect that points in the direction of less savings but a wealth effect that points in a direction of more savings. Which dominates depends on the size of the substitution effect relative to the wealth effect.