Written Exam for the B.Sc. in Economics 2009-II

Micro Economics 1

Final Exam

June 8, 2009

(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

Bill's preferences can be represented by the utility function $u(x_1, x_2) = \ln x_1 + 3\ln x_2$ the two goods have exogenous prices $p_1=3$ and $p_2=1$. Bill's budget is 500 Euro.

a) Find Bill's demand

Now consider a price increase in the price of good one to $p_1=5$.

b) What is Bill's demand now? Decompose the demand in substitution and income effects using the Slutsky compensation

Assume that the price increase is caused by a tax on good one. The government that imposed the tax has decided that no-one must be worse off as a consequence of the new tax.

c) What can the government do to ensure that Bill is <u>just</u> as well off? Find an exact compensation that satisfies this condition.
d) Explain why the answers and the utility Bill gets in question a), b) and c) can differ?
e) What if Bill's utility was quasi-linear, how would this influence the answers?

Question 2

a) Francis is considering an optimal investment of his earnings from a sale of his IT-company. He has 1 million Euro to invest. Francis remembers that his teacher in Micro-economics talked about a *mean-variance model* and as he has not really learned about any other investment models, he thinks that this may be a very good model to use to help him decide on finding an optimal portfolio. Francis' preferences for return and risk can be represented by a Cobb-Douglas utility function. If you let *x* be the share of the 1 million Euro that he will invest in a risky asset, then explain how Francis can use the *mean variance model* to find his optimal portfolio.
b) A government has a policy that it will increase its public infrastructure investments during recessions. This is very beneficial for private engineering consultancies. But during periods with high economic growth these consultancies with focus on public investments do not have very much to do, whereas consultancies focussing on housing constructions are very busy in such periods. How can we analyse the impacts of investments in such two firms (assests) and why are we in particular interested in this? You should relate your answer to the CAPM model.

Question 3

Consider the following two investment projects that the Government can consider as a solution to the large delays occurring daily at the Vejle fiord bridge. The first project is one additional bridge across the fiord. The other project is a Kattegat link. The two projects have very different cost and benefit structures, which you can find in the table below.

Project	Year 1		Year 2		Year 3		Year 4		Year 5	
(in million Kr)	Costs	Benefit	Costs	Benefit	Costs	Benefit	Costs	Benefit	Costs	Benefit
Vejle fiord	500		500		250	750	250	750	250	750
Kattegat	1.000		1.000		1.000		250	2.000	250	2.000

a) If the market interest rate is r=5% and we disregard any other costs and benefits that may occur as consequences of the two projects, which of the two projects should the Government prefer? and why? Explain the importance of the market interest rate and relate this to the two current projects.
b) What must (net) benefits in year 6 of the non-chosen project be for this project to be the preferred one?

Question 4

A farmer has the possibility of renting out his land or grow it himself. Land is a normal good. The rent on land has decreased due to a huge technological efficiency increase, which increases the output from the growing the land.
Can we be certain that this rent decrease will mean that the farmer will decrease the amount of land he rents out? Why/why not?

Question 5

Consider an economy with two agents (Allen and Bank). There are only two goods in the economy: money today and money tomorrow. Allen will inherit 400 (thousand) kr. in period 2 and Bank has 1000 (thousand) kr. in period 1. Allen's preferences over money today and tomorrow can be represented by a utility function $u_A(x_{1,A}, x_{2,A}) = 0.8\ln x_{1,A} + 0.2\ln x_{2,A}$ and the Bank's preferences by $u_B(m_{1,B}, m_{2,B}) = m_{1,B}^{½} m_{2,B}^{½}$

a) Find the Walras equilibrium in this economy and explain why this is Pareto optimal?

b) We now want Allen to have a consumption in period 2 corresponding to half of his original heritage (i.e. x_{2B}=200). Can we ensure this as a market equilibrium? If you agree then show how, if not, then argue why not.