

Examination
Advanced Microeconomics (ECH 32306)

Date: 29 October 2010
Venue: C75
Time: 14.00 - 17.00 hrs

Name:

Registration number:

The exam consists of six questions. **Please answer five questions.**
All questions have equal weight.

Instructions:

Always explain and motivate your answers and calculations. Explain equations and variables used in your answer, indicate the unit of accounts where it applies. On the axes of graphs, clearly indicate the name of the variables.

When finished, hand in both, questions and answers. Do not forget to put your name and registration number on all your answering sheets.

Good luck !

Expected Utility Theory

An agent is risk averse if $u(E(g)) > u(g)$, where g is a gamble, u is a vNM-utility function and E is the expectation operator.

a) Show that an agent with $u(w) = \ln w$ is risk averse when faced with the gamble $g = (\frac{1}{2} \circ (w_0 + h), \frac{1}{2} \circ (w_0 - h))$.

[It may be helpful to know that $\ln x + \ln y = \ln(xy)$ and $\alpha \ln x = \ln(x^\alpha)$]

b) Calculate the certainty equivalent, \hat{c} .

c) Recall the definition of a risk premium: $p = E(g) - \hat{c}$. Is the risk premium associated with gamble g increasing or decreasing in initial wealth? Interpret your finding.

d) The variable h signifies a mean preserving spread. Argue that an increase in h means a larger risk.

A principal-agent problem

There are two agents: a risk neutral land owner and a risk averse farmer. Harvest is subject to risk. The risk is impacted by the farmer's effort. The land owner typically cannot observe the farmer's effort. Only harvest is observable.

a) Argue why or why not the land owner should pay a fixed wage to the farmer.

Assume now that effort e is either low $e_l = 0$ or high $e_h = 1$. With low effort harvest is either low $x_l = 15$ with probability $\frac{2}{3}$ or high $x_h = 60$ with probability $\frac{1}{3}$. With high effort harvest is low with probability $\frac{1}{3}$ or high with probability $\frac{2}{3}$. Furthermore assume the farmer can earn an off-farm wage $w_0 = 30.25$ with effort $e_0 = 0.5$. The landowner maximises profits (assume the price of the crop is 1). The farmer's utility function is $u(w, e) = \sqrt{w} - e$.

b) Give a formal description of the land owner's maximisation problem. What are the relevant constraints the land owner faces when offering a contract to the farmer? Describe the contract that the land owner offers to the farmer.

c) Will this contract be accepted? Calculate the land owner's profit if the contract is accepted.