Suggested Answers for Written Exam for the B.Sc. or M.Sc. in Economics, Winter 2010/2011

Mikroøkonomi A

Final Exam

February 2011

Problem 1

Define and discuss the concept of WARP (Weak Axiom of Revealed Preferences) for a consumer.

See Varian section 7.4.

Problem 2

Consider a consumer whose preferences can be represented by the utility function $u(x_1, x_2) = \min\{ x_1, x_2 \}$, the first good being food, the second being drinks. The consumer lives in a pure exchange economy with perfect competition markets and initially owns w = (4,2), i.e. four units of food and two units of drinks.

- Find the expression for the consumer's price offer curve, as a function of prices (p_1, p_2), both being strictly positive.
- What happens with the desired net trade if both prices are tripled?
- Verify that consumption of food increases as p_1 increases, but decreases if p_2 increases. Please provide some economic intuition.

The offer curve has the expression $[(4p_1 + 2p_2)/(p_1+p_2), (4p_1 + 2p_2)/(p_1+p_2)]$. If prices are tripled, desired net trade will of course remain the same, as only relative prices matter. Food consumption will increase with a higher food price due to endowment income effects (there is no substitution effect).

Problem 3

A consumer has preferences represented by the utility function $u(x_1, x_2) = x_1 \cdot x_2$., with good 1 being clothing, good 2 being food. The consumer has an exogenous money income which is m = 12. Initially, prices are $\underline{p} = (1,2)$, but then change to p = (1,1).

- How does the price change impact the consumer's choice of the two goods?
- Using the concept of Slutsky income compensation, analyze, for both goods, how much of the changes are substitution effects and how much are income effects.

The solution is $\underline{x} = (6,3)$, m' = 9, x' = (4½, 4½), x = (6,6), substitution effect: (-1½,+1½), income effect: (+1½,+1½), total (0,+3)

Problem 4

Consider an Edgeworth economy with two consumers, A and B, with utility functions $u_A(x_{1A},x_{2A}) = \ln(x_{1A}) + x_{2A}$ and $u_B(x_{1B},x_{2B}) = x_{1B} + x_{2B}$. The goods are: Food (1) and housing (2). The total initial endowments in the economy are (5,5), i.e. 5 units of both food and housing.

- Identify the Pareto Optimal (Pareto Efficient) allocations in the economy, and comment

Solution: $x_{1A} = 1$, $x_{1B} = 4$, i.e. the contract curve is vertical (because of A's quasi-linear preferences, there are no income effects, hence all Pareto efficient allocations have the same quantities of good 1).

Problem 5

Within the realm of financial assets, define the concept "the price of risk".

See Varian 13.4; the following expression tells the investor how much to give up, in terms of expected return on portfolio, in order to reduce the standard deviation on return by one unit. $\frac{(r_m - r_f)}{\sigma_m}$

Problem 6

A firm produces toys using labor (input 1) and capital (input 2). The production function is $y = f(q_1, q_2) = q_1^{½} \cdot q_2^{½}$.

- It this production technology characterized by having decreasing, increasing or constant returns to scale?
- With the price of labor being w_1, and the price of capital w_2, find the expression for the firm's cost function C(y)

Constant returns to scale. Cost minimizing inputs are $q_1 = y \cdot (w_2/w_1)^{½}$, $q_2 = y \cdot (w_1/w_2)^{½}$, rendering $C(y) = 2 \cdot (w_2 \cdot w_1)^{½} \cdot y$