Written Exam for the B.Sc. or M.Sc. in Economics summer 2013

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Final Exam

June 2013

(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.

This exam question consists of 4 pages in total including this page.

Problem 1

In a perfectly competitive market for a consumer good, the government introduces a (small) tax of t $ per unit traded.

- 1a) How does the economic incidence ("who bears the tax burden?") depend on the statutory incidence (whether the supply side or the demand side has to pay the tax revenue to the government)?
- 1b) How does the economic incidence depend on the price elasticities of the demand side and the supply side of the market, respectively?

Hint: Introducing the tax, and marginally changing it, can be analyzed considering these two equations: $S(p_s) = D(p_s + t)$ and $S(p_d - t) = D(p_d)$.

Problem 2

In a small village in a remote part of the country, there are 200 inhabitants. Each inhabitant owns a car and is planning to buy one Smart-TV. This marvelous new product can be purchased locally, with no transportation costs involved.

There is, however, a shopping mall, some distance away, selling such a TV at a price $ 100 lower than the local shop. The road to the mall is very narrow. If n villagers drive to the mall, the total transportation costs for the n drivers, in terms of gas used and time spent, is $ n^2.

- 2a) Show that when the villagers make individual decisions on whether to go or not, 100 villagers will drive to the mall
- 2b) Is this outcome efficient? Please comment and provide some perspective

Problem 3

Consider a risk-averse von Neumann-Morgenstern-agent with Bernoulli utility u of income, where u' > 0, u" < 0. The agent has the income M. There is an accident probability π, $0 < \pi < 1$. The accident causes an income loss of L < M.

An insurance company offers the agent insurance contracts at the price of λ per $ paid out in case of income loss.

- Show that the agent, if the price is actuarially fair, will choose an insurance contract implying full insurance.

Problem 4:

Consider a monopolist in a market with the demand side characterized by the demand function D(p). From the definition of the elasticity of demand with respect to price, and from the first order condition for profit maximization ("MR = MC"), please derive the correct expression for the ratio of price over marginal costs expressed in terms of the elasticity.

Problem 5:

Consider three persons, Andy, Bert and Catherine, living in the same building, with a small garden in front. Let G be the total sum of money they spend on this garden; the more they spend, the more flowers, plants, etc.

Each of them has, initially, an individual wealth of $ 10. Their preferences can be represented by the following utility functions, with x_i being the income agent i has after contributing to the garden, i = A, B, C:

$u_A(x_A, G) = x_A - 1/G$

$u_B(x_B, G) = x_B - 7/G$

$u_C(x_C, G) = x_C + \frac{1}{2}G$

Each of them can donate a non-negative amount, no larger than the individual initial wealth, to contribute to the amount G.

- 5a) Identify the efficient level of G
- 5b) Using the concept Lindahl Equilibrium, please identity the corresponding Lindahl prices
- 5c) How would the situation change if the initial distribution of wealth were that A has $ 5, B has $ 15, and C has $ 10.
- 5d) Assume, with the initial wealth distribution being (10,10,10), that C's utility function is changed to $u_C(x_C, G) = x_C + (11/10) \cdot G$ and comment on how this changes the situation.

Problem 6:

The gourmet boutique Choca-Shocka-Shop sells chocolate, for simplicity thought of as a continuous good. Also, for simplicity, assume that production is costless, i.e. MC = 0. The shop faces two potential customers. The slightly richer Mrs. A whose (ordinary Marshall) demand function is given by $D_A(p) = Max \{20 - p, 0\}$, and the slightly less rich Mrs. B with $D_B(p) = Max \{16 - p, 0\}$.

For a series of various cases, competition-wise, mentioned shortly, you are asked to identify the following in equilibrium:

- quantity sold to A and B
- price pr. unit chocolate, or amount paid for a "package", for A and B
- consumer surplus for A and B
- profits for the chocolate seller
- deadweight loss

Please find the above mentioned list of figures for each of the five following cases of competition:

- 6a) The chocolate seller succeeds with first-order (perfect) price discrimination
- 6b) The seller is able to follow a second-order price discrimination policy

- 6c) The seller can, as a monopolist, set different unit prices for each customer, i.e. third-degree price discrimination
- 6d) The seller can, as a monopolist, set one common unit price for both customers
- 6e) The seller acts as if there is perfect competition