

Written Exam for the B.Sc. in Economics summer 2011

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Final Exam

17 August 2011

(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.

Problem 1

In Economic History, The Tragedy of The Commons is a well-known case of an inefficient use of resources.

- Explain, in terms of externalities, how the inefficiency arises, and what can be done to generate an efficient outcome

Problem 2

Consider the company DanishVoila specialized in translation of documents from Danish to Volapyk (the language of a far-away, small nation) and vice versa. The company, working from Denmark, employs translators living in Denmark who know both languages very well. DanishVoila realizes that it is the only employer who is in demand for such translators. The higher the salary for such translators, the more will want to work for the company (and the more translators it wants to employ, the higher salary it will have to pay).

At the same time, DanishVoila is the only translation company in the world with these skills, so it holds a monopoly position vis-à-vis the businesses in the two countries who are the potential customers. The demand for its translation services will, of course, depend negatively on the price it charges for its services.

- Which considerations should DanishVoila have when deciding the number of translators it wants to hire (wanting to maximize profit income to the company's owners)?
- What will happen to the salary of translators, compared to a situation with perfect competition? And to the price of translation services?

Problem 3

Consider an economy with two agents, Ann and Buster. Initially, Ann has an endowment of 5 units of the private good, and similarly Buster has 5 units. Ann's preferences can be represented by the utility function $u_A(G, x_A) = 2 \cdot \ln(G) + x_A$, and Buster's preferences by $u_B(G, x_B) = \ln(G) + x_B$. A public good can be produced, as one unit of the private good can be transformed into one unit of the public good. Each agent may choose to donate non-negative quantities of the private good for this purpose.

- If Buster donates nothing, how much will Ann want to donate?
- Given this donation from Ann, how much will Buster want to donate?
- Which quantity of the public good is efficient (Pareto-Optimal)?

Problem 4

Akerlof claimed that when a market is characterized by asymmetric information, the resulting market equilibrium may not generate an efficient allocation of the good traded, and furthermore that the income distribution may become different compared to the case of perfect information, too.

- Give a presentation of Akerlof's line of argument.

Problem 5

A steel plant is situated by a lake used by a fisherman. Steel plant production is s , fish production is f , and the quantity of pollution being led into the lake by the steel plant, and decided by steel plant management, is x .

The cost functions are $c_s(s, x) = s^2 + (x-s)^2$ and $c_f(f, x) = f^2 + f \cdot x$. The steel plant sells its steel output on a perfect competition market, and the market price of steel is 8. Similarly, fish is sold at the market price 6.

- Identify the profit-maximizing production levels for the two producers, the level of pollution chosen by the steel plant, and the profits obtained by each producer, when they act individually
- Verify that if the two producers were jointly owned, this owner would choose $s = 3$ and $f = 2$
- Identify the level of pollution chosen by a joint owner and the maximum level of profits obtained
- Now, assume again that there is separate ownership, and imagine you are to implement an optimal tax on pollution in this case. Identify the right level for this Pigou tax.

Problem 6

A catering firm Cater King has two kitchen units. Kitchen 1 has the cost function $C_1(y_1) = \frac{1}{2}y_1^2$, where y_1 is the number of meals produced. Kitchen 2 has the cost function $C_2(y_2) = y_2^2$, where y_2 is the number of meals produced. Cater King has, locally, a monopoly, facing the demand curve $D(p) = 480 - p$, with p being the price of a meal.

- How many meals should be produced in each of the kitchen units?
- How large is the mark-up of the price over the marginal costs, percentage-wise?