

Exam: Economic Policy (11071)

Summer term 2013

Examiner: Prof. Dr. Andreas Knabe

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Remark: The exam consists of three questions and all questions have to be answered. Total available time is 120 minutes. A dictionary as well as a calculator (fulfilling the requirements of the examination office) can be used.

Question 1 (*Public Goods*, 40 points)

- a) Explain briefly the intuition behind why the Samuelson rule ensures an efficient provision of a public good.
- b) Two households are deciding over the provision of a public good. Show graphically how the aggregation of marginal willingness to pay for a public good works in the two household case and show at what point the optimum is reached. Derive the optimal provision of the public good if both households have a marginal willingness to pay $MWP = 240 - x$ and the public good has a marginal cost of production of 80. What is the consumer surplus at this optimal level?
- c) Again take two households deciding over the provision of a public good with a marginal cost of production of 80. Household one has the same marginal willingness to pay as in (b) and household two has marginal willingness to pay $MWP = 200 - x$. Derive the efficient level of public goods provision. What cost share should household one pay if the provision follows Lindahl pricing? What is the disadvantage of using Lindahl pricing for provision of public goods?
- d) Consider 4 farmers who graze their cows on a common field to produce milk. Farmers sell the milk for a price $p = 1$. Each cow costs 40 euro. Each cow produces milk according to the production function $f(X) = 200 - \frac{1}{2}X$, where X is the total number of cows x_i grazed on the field. How many cows are grazed on the field if farmers act collectively? How many cows are grazed on the field if farmers act individually? Compare the results and briefly explain the intuition behind why they may differ.

Question 2 (*Market Power*, 40 points)

- a) A monopolist faces inverse demand $p(x) = 180 - x$ and has a marginal cost of production of 20. Derive the monopolist's quantity and price and compare it to the efficient outcomes. Derive the welfare loss due to the monopolist. Briefly describe three policy tools available to a government for dealing with a monopolist.
- b) What per unit subsidy would the government in part (a) need to offer the monopolist to get to the efficient solution? Show graphically how the subsidy would work. Would you expect a lump sum subsidy to be able to achieve the same result?

- c) Assume two lobbying firms attempt to acquire the monopoly profit in (a) through rent seeking. Explain what happens to the overall welfare loss from the monopoly. How would this change as the number of rent seeking firms increases?
- d) Let the cost of producing a good in amounts x be given by $C(x) = F + cx$, where $F > 0$ and $c > 0$ are constant parameters. Explain what this implies about the efficient allocation in the market.

Question 3 (Taxation, 40 points)

- a) Explain the difference between a tax schedule with a tax exempt amount and tax schedule with a tax threshold. Show both types of schedule graphically and show the relationship between average and marginal tax rates graphically for the two types of schedule.
- b) Let a tax schedule be $T_1(y) = \max[\frac{1}{2}(y - 100), 0]$ where y is the taxable base. Derive the marginal and average tax rate for this schedule analytically. Define what is meant by a progressive, a regressive and a proportional tax schedule. Which type is T_1 ?
- c) Show how the marginal tax rate and the average tax rate must relate for a tax schedule to be progressive. Use your condition to show that the tax schedule $T_2(y) = \frac{1}{2}y^2$ is progressive. Define what is meant by indirect and direct progression. Which type is T_2 ?
- d) Describe two problems with tax progression.