

Examination: Economics IV (Economic Policy/Public Economics)

Summer 2006

Examiner: Prof. Dr. Ronnie Schöb

Exam Number: 5026

Date: July, 26th, 2006

Name, First Name

Student Number

Study Program and Semester

Remarks

1. The following aids can be used: dictionary, calculator according to the examination office's list.
2. The exam consists of 3 open questions and 10 multiple choice problems. **All** questions and problems have to be answered.
3. Total available time is **120 minutes**.
4. Please write readable and leave a margin at the right for corrections. For the multiple choice problems, please mark the correct answer directly on the problem sheet.

Good luck!

Problem 1 (25 points)

If information is distributed asymmetrically, we may observe that individually rational behavior does not lead to a Pareto-efficient allocation.

- (a) Explain this case by discussing ex-post moral hazard. Use a graphical illustration to support your argument!
- (b) Use your figure from part (a) to show how the welfare loss can be reduced.
- (c) Given your answer in part (b), can the welfare loss of ex-post moral hazard be fully avoided? Discuss, whether this would be desirable or not.

Problem 2 (30 points)

Suppose that in the country of 'Banana island' the cost function for providing telecommunication service of the extent y is given by $C(y) = 10 + y$, whereas the inverse demand is represented by $D(y) = 10 - 0.5y$.

- (a) Suppose that initially the government of the island assigns the right to produce telecommunication services to only one firm. Which price and which quantity of y will emerge in this situation?
- (b) Determine the socially efficient quantity of y and calculate the welfare gain compared to part (a). Show, how consumer and producer surplus is changing, when switching from (a) to the efficient situation.
- (c) The owner of the firm shouts: "The situation in (b) cannot be a Pareto improvement compared with (a), because I am worse off". Give a short reply.
- (d) The government can impose price regulations on the firm. Discuss all possible welfare consequences of a price cap that yields the efficient amount of y . Determine the welfare loss for a price cap that leaves the firm with zero profits.
- (e) Use a graphical illustration to explain that a subsidy on each quantity sold by the firm is able implement the efficient solution. Calculate this subsidy with the numbers given in the problem.

Problem 3 (20 points)

In order to provide public goods, the government needs tax revenue. The introduction of a tax rate may, however, lead to a welfare loss.

- (a) Suppose that only two goods (x, y) are consumed in an economy. A representative consumer has preferences $U = U(x, y)$ which can be represented by convex

indifference curves and faces prices ($p_x = p; p_y = 1$). Starting from this initial situation, let the government introduce a tax t on good x such that its consumer price increases to $p + t$. Use a graphical illustration in (x, y) -space to explain in detail what the equivalent variation of this government action is. How can the excess burden of taxation be measured by using the equivalent variation?

- (b) Calculate the equivalent variation and the excess burden for the utility function $U(x, y) = x \cdot y$, where prices are given by $p_x = 2$ and $p_y = 1$, income is $m = 24$ and a quantity tax of $t = 1$ is introduced.

Multiple Choice Problems (2.5 points each)

1. Which of the following statements with regard to a progressive tax schedule is *false*?

| | |
|---|---|
| A | The marginal tax rate must exceed the average tax rate. |
| B | The marginal tax rate must be increasing for the whole range of the tax base. |
| C | A tax allowance can produce tax progression. |
| D | Tax progression may violate the postulate of horizontal equity. |

2. Assume that an individual has an initial wealth of y_0 and faces the risk of a heart attack. In the case of a heart attack, the costs of rehabilitation are L and exceed the initial wealth. Consider the individual's choice whether to insure at a fair premium or not given that the state guarantees a minimum wealth y_{\min} . Which of the following is true, *ceteris paribus*?

| | |
|---|---|
| A | It is more likely that the individual will insure, if y_0 is low. |
| B | It is more likely that the individual will insure, if y_{\min} is low. |
| C | It is more likely that the individual will insure, if the probability of a heart attack is low. |
| D | The individual will always choose not to insure. |

3. What can be said about the tax incidence and the excess burden of taxation in a partial equilibrium?

| | |
|---|--|
| A | If the material burden is on consumers only, the excess burden reaches its maximum. |
| B | If the material burden is equally shared between consumers and producers, the excess burden is zero. |
| C | If the excess burden is zero, then the tax incidence must be on producers only. |
| D | If producers supply a fixed amount of a commodity, the excess burden is zero. |

4. Which of the following statements with respect to the excess burden of taxation in a partial equilibrium is *true*?

| | |
|---|---|
| A | The excess burden measures the costs of administration. |
| B | The excess burden can be avoided, if the tax revenue is spent on public goods. |
| C | The additional excess burden is larger the higher the pre-existing tax wedge on the market. |
| D | There is no excess burden if the tax is negative, i.e. the commodity is subsidized. |

5. Which of the following statements with respect to the First Theorem of Welfare Economics is *false*?

| | |
|---|---|
| A | Economic agents are required to be price takers. |
| B | There must not be external effects in production or consumption. |
| C | The market outcome is fair. |
| D | Public goods cannot be provided in an efficient way by private markets. |

6. For an efficient provision of a public good for the households A and B we must have

| | |
|---|---------------------------|
| A | $MRT = MRS^A - MRS^B$ |
| B | $MRT = MRS^A = MRS^B$ |
| C | $MRS^A = MRT - MRS^B$ |
| D | $MRT = MRS^A \cdot MRS^B$ |

7. Consider the labor-leisure decision of a household, where each unit of labor supply is rewarded by a wage rate w . Assume, wage income is taxed so that the net wage rate is $w(1-t)$ and the household re-optimizes by again choosing the highest utility given the new budget. If we observe that the amount of labor supplied (leisure consumed) remains constant, we can conclude the following.

| | |
|---|---|
| A | There is nevertheless an excess burden. |
| B | Since there is no reaction with respect to labor supply, there is no excess burden. |
| C | The household is damaged, but only to the amount of tax revenue. |
| D | There is no substitution effect. |

8. The market for teddy bears can be described by the supply function $S(p) = 5p$ and the demand $D(q) = 100 - 4q$, where q is the consumer price, p the producer price and $t = q - p$ a quantity tax. What is the additional excess burden if the tax rate is increased from $t_0 = 3$ to $t_1 = 6$?

| | |
|---|--------------------|
| A | 20 |
| B | 40 |
| C | 60 |
| D | None of the above. |

9. Which of the following statements concerning the Clarke-Groves-Mechanism is *false*?

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9. Which of the following statements concerning the Clarke-Groves-Mechanism is *false*?

| | |
|---|---|
| A | Refunding the Clarke tax revenues to individuals would destroy the incentive-compatibility. |
| B | Only pivotal voters have to pay a Clarke tax. |
| C | Clarke tax revenues are declining in the number of participating voters in the zero-one decision problem. |
| D | Without Clarke tax revenues, a public good cannot be provided. |

10. Which of the following statements about the Pigouvian tax is *true*?

| | |
|---|--|
| A | To achieve Pareto efficiency, the government needs to know how property rights are distributed. |
| B | A Pigouvian tax does not work if the revenue is used to provide public goods. |
| C | A Pigouvian tax cannot achieve the environmental goal at minimum economic costs. |
| D | To achieve Pareto efficiency, the government needs information on the marginal environmental damage at the social optimum. |