

Written Exam for the B.Sc. in Economics autumn 2012-2013

Microeconomics B

Final Exam

25 January 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.

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.

Question 1

You are looking for a new pair of shoes in a shop. You know that there are shoes of two different qualities, but you cannot distinguish them from each other and you do not know which type(s) the shop is offering. We assume that your preferences over different qualities of shoes can be expressed by the function $u(q)=q$ where q is the price you have to pay for a pair of shoes (i.e. we assume that you are risk neutral).

Assume that your willingness to pay for the two different qualities are 1400 kr. and 800 kr. respectively.

- a) Assume also that the marginal costs for the shop of both types of shoes are 1150 kr. Explain which problem that can arise here. What are the different cases we can consider and explain the possibilities of trade and the circumstances for the trade to happen.
- b) Now assume that the marginal costs of producing good and bad quality shoes differ. The marginal costs of good shoes are 1150 kr. and for bad quality shoes they are 1100 kr. How does this influence the situation?
- c) Can anything be done to remedy the situation happening? And why may this not always be a good idea?

Answer:

a) *We have a case of asymmetric information. The way the Bernoulli utility function is formulated means that we can consider this a case of risk neutrality. The three different cases that can be considered are 1) the shop offers only good quality shoes, in which case you are willing to buy and all gains of trade are exploited; i.e. efficient 2) only bad quality shoes are offered, and you will not buy, which is again efficient 3) only a share s of shoes are of good quality. Trade will only happen if the share s is large enough such that the expected value of the offered shoe is larger than the marginal costs: $s \cdot 1400 + (1-s) \cdot 800 \geq 1150$ giving $s \geq 7/12$.*

b) *The problem is that the shop is now given an incentive to only sell bad quality shoes (it knows that you are not able to tell the two qualities apart) since they can save costs from that. You of course realise this and are no longer willing to buy any shoes since your wtp is only 800 for a pair of shoes that have costs of 1100.*

c) *Yes, there are some possibilities: either you can undertake an effort of screening the shoes (a very thorough check by an external expert) or the shop can try to signal the qualities of the shoes (e.g. giving guarantees). This is only a good idea if the screening or signalling costs are not larger than the gains that can be achieved from being able to distinguish qualities. In our particular case it is only beneficial if the costs are less than the surplus $s \cdot (1400 - 1150)$ that can be obtained*

Question 2

Explain why we with insurance contracts may encounter cases, where an insurance taker does not fully insure (have the same consumption in good and bad state).

Answer:

This may happen in situations where we have actuarially unfair insurance contracts. This should be accompanied with explanations and/or illustrations underpinning the problem.

Moreover, other possibilities are that agents have state-dependent preferences and/or are risk loving/neutral. A further element that could be mentioned is that insurance firms require excesses, which is comparable to the actuarially unfair insurances.

Question 3

Consider a model of two consumers where an agent's activity (or consumption) causes an externality for the other agent. Comment on the statement: *if we can establish property rights over the externality causing activity, then we will end up in the same equilibrium (level of externality) independent of who is allocated the property rights.*

Answer:

This is an argument along the lines of Coase. It is true if preferences are quasi-linear, but when this is not the case then we have only ensured that the externality is internalised - i.e. a market of the externality has been established. The exact equilibrium depends on the allocation of property rights. This can be accompanied by an Edgeworth diagram showing the differences between different equilibria.

In addition also transaction costs should be mentioned, which are also a requirement of Coase's theorems.

Question 4

We are considering a case of a public good. The public good is a cleaning lady (or man!) to clean the common rooms in a dormitory. The dormitory consists of 20 students. The costs of the cleaning lady is 30000 kr. per year and the costs must be shared equally among the students if they decide to hire the cleaner.

The students do not have the same value of the cleaner. 12 students (the immature type of students - denoted A) has individual value of 750 kr. each, and 8 students (the mature students - denoted B) have an individual value of 2700 kr. each. These individual values are private information.

- If the dormitory holds a referendum where the decision of hiring the cleaner or not is based on a simple majority vote, what will the decision be? (The votes are cast in a written anonymous way). Is this efficient? Why/why not?
- Assume that one of the students (you?) can persuade the rest of the students that a Clarke-Groves mechanism should be the decision mechanism and should also determine the individual payments. Will the cleaner be hired? What are the payments for each of the two types of students?
- What may be the problems of applying the Clarke-Groves mechanism? Can you suggest another (theoretical) solution to the problem of optimal provision/demand for public good?

Answers:

a) Since a majority of the students will have to contribute more to the cleaner than the value to them, they will reject the cleaner. This is not efficient because the sum of individual values exceeds the total costs. In general the problem is that the individuals do not have any incentive to reveal their true value of the public good, in which case different contributions could be defined. But when individual values are private information, the students do not have incentives to tell the truth about their true values.

b) Now the cleaner will be hired. The C-G mechanism provides the two types of students with the right incentives to reveal their true type. The payments are determined by the fixed payment of 1500 kr each and the Clarke tax. To determine whether each of the types must pay the Clarke tax, we must determine if they are pivotal - i.e. whether they can change the decision by being part of the group. For type A: the sum of net values are: $11 \cdot (750 - 1500) + 8 \cdot (2700 - 1500) = -8250 + 9600 = 1350$. Hence, the Type A are not pivotal and will not pay the Clarke tax. For type B the sum of net values is $12 \cdot (750 - 1500) + 7 \cdot (2700 - 1500) = -600$. Hence, type B is pivotal and will thus pay a Clarke tax of 600 kr. and have a total payment of $1500 + 600$ each.

c) The Clarke tax is only introduced in order to make the two types of students reveal their true values. But the tax is an extra payment, which in this case adds up to $8 \cdot 600 = 4800$ kr. such that the total payment to the cleaner is 34800 kr, and the tax is thus wasteful. Another theoretical possibility is to set up Lindahl individual prices such that each type will demand exactly the same quantity of the public good. In our particular case we have a discrete good so the individual payments are such that the value of the cleaner exceeds the prices. However, this requires that the private information is revealed.

Question 5

Consider a monopolist who has the possibility to charge a two-part tariff from its product: $P(x) = F + px$. The fixed (F) and the variable (p) unit part of the tariff are for now assumed to be equal across the two different types of consumers.

The consumers are assumed to have a preferences over the good that can be represented by utility functions: $U_1 = \frac{3}{2} - \frac{3}{2}(1-x)^2 - P(x)$, and $U_2 = 1 - (1-x)^2 - P(x)$.

The marginal costs for the monopolist are constant and equal to c .

Finally assume that a fraction q of the customers that the monopolist is facing are type 1.

- Write up the constraint the monopolist must consider if she wants both the customer types to consume of the good.
- If the monopolist can only charge one single two-part tariff, what is the optimal per-unit charge then?
- Explain what the incentive compatibility constraint that the monopolist would have to consider if the monopolist could charge two different two-part tariffs, is. You do not have to find it, but you may argue using diagrams etc. Moreover, should the monopolist always choose to differentiate the tariffs this way?

Answers:

This question follows the derivation in the book closely, but with explicit functional forms and parameter values.

a) The IR constraint for the monopolist is such that the fixed charge must not exceed the consumer's surplus for type 2 (the one with the lower wtp). To find the CS in this particular case we find the demand to be $x(p) = 1 - P$. This can be used to find the consumer's surplus (invert the demand function and calculate the area under the demand curve with $F=0$). The CS is then equal to $CS_2 = \frac{(1-p)^2}{2}$.

Hence, the IR constraint is that $F_2 \leq CS_2$

b) The monopolist maximises his expected profit $E[\Pi] = CS_2(p) + q(p - c)x_1(p) + (1 - q)(p - c)x_2(p)$. Insert the demand functions and the optimal level for the fixed part of the tariff. Then solve for p and we find that $p = \frac{c(q+1-q)}{2(q+1-q)-3}$

c) The IC constraint is such that customer type 2 will not find it attractive to choose the quantity/price package intended for his type. However, this will not always be attractive for the monopolist. If there are sufficiently many high demand customers or if the difference in the 'taste' parameter is large enough, then it may be a better choice to violate the IR constraint in que. a)

Question 6

The financial situation right now is very difficult and many firms find it difficult to get a loan in the financial institutions. Explain why this is the case using your knowledge from the course

curriculum. You should especially include an explanation of the apparent paradox that banks will not lend out money even though they could simply charge a higher interest rate.

Answer:

We can argue for this situation using the model of moral hazard. The problem is that the agents wanting a loan have an incentive to undertake projects with higher risks, but with a small probability of a large success (profit). This increases the probability that firms will not being able to repay the loans to the financial institutions. This will especially be aggravated if the interest rate (or repayment) on the loans becomes large since this increases the incentive to take chances (moral hazard).

The answer can be complemented by a small mathematical model illustrating the point.