

Exam Microeconomics 2, 2010-I

Recommended answers

Question 1

Explain why *framing* may be a problem in neoclassical microeconomics. You should illustrate this by examples.

Answer

The problem is that the setting/conditions under which peoples' responses/choices are made influence the choices. An example is that if agents are given information about something (it may even be something that does not mean anything for the choice they are going to make) then this information may influence the actual choices. For example guessing the price on a house is influenced by prior information about house prices in different locations.

Question 2

Jenny enjoys baking cakes. Her preferences for baking, x_b (the amount of cakes), and other consumption, x_j , can be represented by the utility function: $u(x_b, x_j) = x_b(x_j)^{1/2}$. There is a cost of buying ingredients for the cakes of p_b and the price on other consumption is normalised to 1. Jenny has an income of M_j .

- a) Formulate Jenny's problem and find the optimal amount of baking and other consumption.

Jenny's sister, Francine is on a diet trying to loose weight, and she is therefore not too happy about Jenny's baking. Francine has a utility function $u_f(x_b, x_f) = x_f - \ln x_b$, where she takes the amount of cakes, x_b for given and where x_f is her consumption of other goods. Her income is M_f . Jenny and Francine's mother cares about both girls and therefore tries to balance diet and baking.

- b) How many cakes should their mother allow Jenny to bake? Explain why this quantity differs from your answer in a)
c) If the two girls did not have a mother to decide how many cakes Jenny may bake, and Jenny had always been allowed to bake, what could Francine then do to influence Jenny's choice?

Jenny and Francine also have a brother George, who is the grateful consumer of Jenny's cakes. His utility function is $u(x_b, x_g) = x_g + \ln x_b$

- d) What is the optimal amount of cakes that the mother should set now? Explain the difference between the answers in the sub questions – especially explain why the outcome that would result from the option(s) Francine has in (c) may have a special aspect in the problem we now consider.

Answers

- a) Max utility s.t. $p_b x_b + x_j = M_j$. This gives amounts $x_b = 2/3 M_j / p_b$ and $x_j = 1/3 M_j$
b) The cakes are now a negative externality and the mother should take this into account. She can find the optimal balance by e.g. maximising the sum of their utilities subject to the total available budget.
c) The property rights are now well-defined and there is thus a market for 'permits' to bake. Francine can thus buy some of these 'permits' from Jenny to reduce the quantity of cakes.

The market equilibrium can be found from solving the consumers' problems and finding the equilibrium price.

- d) *We can see that George's and Francine's utility from the externality of cakes compensates each other. The optimal quantity of cakes is thus similar to the answer in a). The main difference is that cakes are now to be considered a public good. If Francine bribes Jenny to reduce the amount of cakes then this also influence George's utility. This is an example of how there can be a public good element in externalities.*

Question 3

Comment on the statement:

It is always optimal for a government to use regulation policies to tackle market imperfections. For example to levy a Pigou tax to set the optimal level of externalities.

Argue why you agree or disagree with the the above statement.

Answer

The statement is false. If the government is prevented from using first best policies, then it may be beneficial to divert from first best policies to second best policies. Also if there are market imperfections in more than one market, then solving for the imperfection in one market may not be the optimal policy.

Question 4

Consider a venture fund that wants to invest in interesting new projects. A potential new borrower is considering two projects; a risky project (A) with a low probability (π_A) of success, but with a high return if it succeeds; the other project has a higher probability ($\pi_B > \pi_A$) of success, but the return if successful is smaller ($R_B < R_A$).

- Explain why there may be a conflict between the borrower and the venture fund. What do we call this type of conflict?
- What may the venture fund do to avoid the conflict? Is it always beneficial for the venture fund to do this? Describe a condition in relation to the sketched model that would ensure this.
- The venture fund has many potential borrowers, but limited resources. Does the limitation have any implication for the rent and loans that the fund provides?

Answers

- The borrower may want to undertake the risky project because the expected payoff (profit) $\pi_A R_A > \pi_B R_B$ may be larger in the risky project. This induces the borrower to undertake a project that may lead to failure and thus bankruptcy for the borrower and thus no repayment to the venture fund. The expected repayment to the venture fund from each of the two projects is higher from the safer project. Hence, the venture fund would like the borrower to choose the safe project. This leads to a Moral Hazard problem*
- The problem is that the venture fund cannot control the borrower's choice and thus have to provide incentives for the borrower, which means reducing the repayment from the borrower such that the expected profit for the borrower is higher from the safe project*
- Normally we would think that the venture fund should increase the interest rate (the price on money), but since there may be a risk that the potential lenders will undertake risky projects with a lower expected return. Demanding a higher repayment (price on money) this may*

increase the moral hazard risk and in the end lead to a lower expected return for the venture fund.

Question 5

Steven has a firm that is clearing snow under winter conditions for private customers. The costs of clearing snow are $1/4x^2$. We consider x as the number of hours that are used for clearing snow. More hours mean a better quality. In the area where Steven is supplying his service, there are two types of customers. The wealthy house owners with a demand function of $p_h(x_h) = \text{Max} \{ 200 - 1/4x_h, 0 \}$, and the group renting their semi-detached houses with a demand function $p_r(x_r) = \text{Max} \{ 120 - x_r, 0 \}$.

- If Steven can price discriminate of degree three, what prices should he set towards the two groups of customers?
- Which group pays the higher price and what is the intuition behind this? (Hint: consider the elasticities)

Answers

- Find MR: for h : $MR=200-0.5x$ and for r : $MR=120-2y$. Find MC as $MC=0.5(x+y)$. Set $MC=MR$ for one of the two groups: $200-0.5x=0.5x+0.5y$ which gives: $x=200-0.5y$. Insert into $MR=MC$ for the other group: $120-2y=0.5(200-0.5y)+0.5y$ leading to: $20=2.25y$ such that $y=80/9$. Insert this into $x=200-0.5y$: $x=200-0.5*80/9=195.56$. The prices are then r : $p_r=120-80/9$ and $p_h=200-0.25*195.56=151.111$
- The homeowners pay the higher price since their price elasticity is lower (numerically). A price discrimination monopoly should set a higher price towards the less responsive group.

Question 6

Consider an Edgeworth economy with two consumers A and B. Their total endowments are (15,5) and the utility functions are

$$u_A(x_{1A}, x_{2A}) = 5 \cdot x_{1A} + x_{2A} \text{ and}$$

$$u_B(x_{1B}, x_{2B}) = x_{1B} + 5 \cdot x_{2B}.$$

- What are the utility possibilities for this economy – you should consider the Pareto optimal allocations
- Describe a social welfare function, that is increasing in both agents' utilities, but where utility is maximised in one of the extremes (e.g. either where A has everything or where B has everything)
- Are the equitable allocations the same as the Pareto optimal allocations in the economy – discuss similarities and differences

Answers

- The PO allocations are the "lower boundary" of the Edgeworth box and the "right hand side" of the box: i.e. A should have everything of commodity 1 and/or B should have everything of commodity 2. The maximal utility for A is 80 and for B it is 40. The utility possibility border is piecewise linear and have the corners (80,0), (X,Y) and (0,40).
- A SWF with the form $10u_A + u_B$ – which is clearly maximised in the allocation where A gets everything. If the SWF $= u_A + 10u_B$ gives the opposite
- An equitable allocation is where none of the agents envies the other agent's allocated goods. For A to be envy-free we must have that: $5 \cdot x_{1A} + x_{2A} \geq 5 \cdot (15 - x_{1A}) + (5 - x_{2A})$, ie.

$5 \cdot x_{1A} + x_{2A} \geq 40$. And for B to be envy-free we must have:

$x_{1B} + 5 \cdot x_{2B} \geq (15 - x_{1B}) + 5 \cdot (5 - x_{2B})$, i.e. $x_{1B} + 5 \cdot x_{2B} \geq 20$, or $x_{1A} + 5 \cdot x_{2A} \leq 20$.

This means that equitable allocations are in the area determined by the corners outlined by the inequalities above.

There are envy free allocations that are not PO since not all "gains of trade" have been exploited.

There are also PO allocations that are not "fair" because one of the agents (despite differences in MRS and despite all gains of trades are exploited) prefers the other agent's bundle over its own.