

Cooperation



**ASSIGN
BUSTER**

Cooperation can arise in the case of infinitely repeated prisoner's dilemma as is implied by the Folk theorem which says that "virtually any pattern of action can be generated by the equilibrium of infinitely repeated games, if the discount rate is sufficiently low." [1] If ostracism is possible and its penalty is large enough relative to the low discount factor, cooperation can be achieved. Example-

	Anne's choice	Billy's choice
Confess	Non-confess	Billy: 5 years Anne: 5 years
Confess	Confess	Billy: 10 years Anne: 1 year
Non-confess	Non-confess	Billy: 1 year Anne: 10 years
Non-confess	Confess	Billy: 2 years Anne: 2 years

Initially the Nash equilibrium will be attained at (confess, confess) strategy and both will get imprisonment for 5 years. However, if the game is repeated infinite number of times, ultimately cooperation can be achieved and both will be imprisoned for 2 years each. Q3: "Education can serve as a signal of high ability even when it does not increase knowledge and productivity." Explain why and under which conditions this statement holds true.

Answer: 'Education can serve as a signal of high ability even when it does not increase knowledge and productivity.' This holds true in case of asymmetric information, which occurs in the market situation when the buyers and sellers have different information while making the transaction. Education undoubtedly can raise one's productivity. But, as has been stressed by Spence, [2] in his model of signalling, even if education does not improve one's productivity, it will still be a useful signal of productivity because it is easier and less costly for more productive persons to obtain a higher level of education as compared to low productivity persons. More productive persons are more intelligent, highly motivated, more hard working and are therefore likely to obtain a higher level of education which

can be used as signal of their higher productivity to enable them highly lucrative jobs. For all these reasons firms are right in thinking that education is a signal of productivity. The hiring firms do not know about the worker's productivity but education serves as a signal and a person's education level can be easily measured by the number of years of schooling, the degrees obtained, the college or university where s/he studied, the grade obtained etc. Q5: What is a public good and how can one determine the optimal level of provision of a public good? Answer: Goods which are non-rival and non-excludable in nature are called public goods.

Non-rival goods are goods whose consumption by one individual does not reduce the consumption for the other individuals. Non-excludability implies that it is difficult, if not impossible, to exclude those from consuming them who are not willing to pay a price for them. Examples- national defence, flood control projects, pollution control project, street light etc.

Determination of provision of optimal level of public good
The production of public goods is usually not produced at the socially desirable optimal level because of the free rider's problem. Suppose that society is composed of two persons, A and B, and the public good is the pollution control project aimed to clean air which, if produced, would benefit both of them. Person A and Person B may not perceive to receive the same amount of marginal benefits from this pollution control measure. Due to differences in perceptions of/to individuals, the curve showing marginal benefit from the pollution-free air are different, the curves MB_A and MB_B depict the Marginal Benefits obtained by individual A and B respectively from the varying quantities of pollution-free air. The Marginal Benefit curve can also be interpreted as the price

which the individuals are willing to pay for the different quantities of pollution-free air.

In order to determine the Pareto optimal quantity of pollution-free air, the total market demand curve, or the aggregate marginal benefit curve, of the individuals comprising the society is required. Market demand curve for the public can be obtained by vertically summing up the individual demand curves. Individual A is prepared to pay a price $Q1A1$ for $OQ1$ quantity of pollution free air while individual B is prepared to pay price $Q1B1$ for the same $OQ1$ quantity which he consumes at the same time as individual A. Thus, for $OQ1$ quantity of clean air the total price which the two individuals are willing to pay equals $Q1A1 + Q1B1 = Q1M$. Similarly $Q2A2 + Q2B2 = Q2M$. Pareto efficient level of output is determined at which the price which the individuals together are willing to pay for the good equals the marginal cost of production. Suppose marginal cost is constant and is equal to OP . Aggregate marginal benefit is equal to marginal cost at OP price and OQ units of output.

Thus, OQ is Pareto efficient level of output of public good. Q6: The Phone-on-Us mobile phone company is advertising a special Christmas promotion: for a cost of 30 pounds per month you can make unlimited phone calls.

Alternatively, you can pay a subscription of only 3 pounds per month and be charged 1 pound for each hour of conversation. Assume that you are planning to use your pocket money to finance your mobile phone expenditure; your pocket money is 50 pounds per month. Answer:(a) On a diagram where you denote the number of hours of mobile phone conversations on the horizontal axis and pocket money spent on everything

else on the vertical axis, sketch the budget line with the special Christmas promotion. (b) On the same diagram, draw the budget line without the Christmas promotion. If he spends all money on mobile conversation, he can make talk for 47 hours and if he spends nothing on mobile conversation, he can spend his entire pocket money on other things. (c) Where do the two budget lines cross? The two indifference curves cross at point e as shown in the above figure.

1. Draw indifference curves for someone who chooses the Christmas promotion and for someone who doesn't. 2. Indifference curve for someone who chooses Christmas promotion Indifference curve for someone who doesn't chooses Christmas promotion (e) Consider someone who, having to choose whether to go for the Christmas promotion or not, has chosen not to.

Imagine that a New Year promotion is later introduced whereby Phone-on-Us charges you a fee of 10 pounds per month inclusive of the first 11 hours of conversation and then 1 pound for each additional hour. Argue that a consumer, who has not chosen the Christmas promotion, may now choose the New Year promotion. Answer: Suppose that a consumer converses for 20 hours in a month; this will cost him only £19, which is cheaper if we compare it with the non-promotional plan. In the latter case it would have cost him £23.

It holds true even if he has to talk for more than 20 hours. Thus, we can say that a consumer, who has not chosen the Christmas promotion, may now choose the New Year promotion. Q9: The National Insurance Company offers an auto insurance policy that costs 1000 pounds and offers full coverage for an accident minus a deductible of 200 pounds. The Union Insurance

Company offers a policy that costs 900 pounds and offers full coverage for an accident minus a deductible of 600 pounds. Drivers are either safe or reckless. If a driver is safe, she has a 5% chance of having an accident. If a driver is reckless, he has a 50% chance of having an accident. For simplicity assume that accidents always result in the car being completely destroyed.

Margaret and Bob own similar cars, each worth 20,000. They are both risk neutral. a) If Margaret is a safe driver, will she buy insurance? If so, from which company will she buy? If Margaret is a safe driver, she will be indifferent to buying insurance, as she is a risk-neutral person and her expected loss is just equal to the cost of insurance, which is £1,000. (b) If Bob is a reckless driver, will he buy insurance? If so, from which company will he buy? Yes, he will buy insurance, as his expected loss, which is equal to £10,000 is much greater than the cost of insurance. He will buy insurance from National Insurance Company to minimise his expected loss. (c) Suppose now that Bob could choose to be safe or reckless, what would he do? If Bob could choose to be safe or reckless, he will be safe as his expected loss due to accident is much lower if he is safe than if he is reckless. (d) If you buy a new car and try to sell it in the first year – indeed, in the first few days after you buy it – the price that you get is substantially less than the original price. Use Akerlof's lemons model to give one explanation for why.

In the Akerlof's model, 'lemons' are the defective used cars and good used cars are 'cherries'. The buyer of the car, due to information asymmetry, does not know beforehand whether it is a lemon or a cherry. Thus, even if the car is in a very good condition, but due to uncertainty, the buyer assumes that the car is of average quality and therefore he will be willing to pay a

price equal to the price of a car of known average quality. This means that even a well-maintained, good, used car, which has never been abused/scratched etc, will not be able to fetch a good price for itself. Q10: Consider an exchange economy with two goods (1 and 2) and two consumers (A and B). There are 10 units available of each of the two goods and both consumers are equally endowed with 5 units of each of the two goods. While Mr A cares for both goods, Mr B only cares about consumption of good 1. (a) Draw the initial endowments and the indifference curve maps representing each consumer preferences in an Edgeworth box diagram.

In the above diagram consumer A's preferences are shown by convex indifference curves while consumer B's preferences are shown by straight line indifference curves parallel to the Y axis. (b) Starting from the initial endowment point, describe the area of mutually beneficial trades between the two consumers. The area marked in blue represents mutually beneficial trade possibilities. Here consumer B gains by increasing consumption of good 1 and consumer A gains by increasing consumption of good 2.