

# Chapter 4 public finance answers

[Finance](#)



**ASSIGN  
BUSTER**

Part 2 – Public Expenditure: Public Goods and Externalities Chapter 4 – Public Goods 1. a. Wilderness area is an impure public good – at some point, consumption becomes nonrival; it is, however, nonexcludable. b. Satellite television is nonrival in consumption, although it is excludable; therefore it is an impure public good. c. Medical school education is a private good. d. Television signals are nonrival in consumption and not excludable (when broadcast over the air). Therefore, they are a public good. e. An automatic teller machine is rival in consumption, at least at peak times.

It is also excludable as only those patrons with ATM cards that are accepted by the machine can use the machine. Therefore the ATM is a private good. 2. a. False. Efficient provision of a public good occurs at the level where total willingness to pay for an additional unit equals the marginal cost of producing the additional unit. b. False. Due to the free rider problem, it is unlikely that a private business firm could profitably sell a product that is non-excludable. However, recent research reveals that the free rider problem is an empirical question and that we should not take the answer for granted.

Public goods may be privately supported through volunteerism, such as when people who attend a fireworks display voluntarily contribute enough to pay for the show. c. Uncertain. This statement is true if the road is not congested, but when there is heavy traffic, adding another vehicle can interfere with the drivers already using the road. d. False. There will be more users in larger communities, but all users have access to the quantity that has been provided since the good is nonrival, so there is no reasons larger

communities would necessarily have to provide a larger quantity of the nonrival good. 3.

We assume that Cheetah's utility does not enter the social welfare function; hence, her allocation of labor supply across activities does not matter. a. The public good is patrol; the private good is fruit. b. Recall that efficiency requires  $MR_{STARZAN} + MR_{SJANE} = MRT$ .  $MR_{STARZAN} = MR_{SJANE} = 2$ . But  $MRT = 3$ . Therefore,  $MR_{STARZAN} + MR_{SJANE} > MRT$ . To achieve an efficient allocation, Cheetah should patrol more. Chapter 4 - Public Goods 4. The Search for Extra-Terrestrial Intelligence is a public good because it is nonrival and presumably non-excludable. The government should pay for the research only if the SMB is greater than the SMC. . Aircrafts are both rival and excludable goods, so public sector production of aircrafts is not justified on the basis of public goods. If policymakers erroneously assume that the benefits of the mega-jetliner are public, then they would find the efficient level of production by vertically summing demand curves rather than horizontally summing demand curves. This causes the benefits to be significantly overstated and could be used to justify such high costs. 6. It is unlikely that if Pemex were privatized that the situation would lead to a monopoly situation. Comparing oil production to telephone service is not a correct comparison.

In the case of the telephone company, there was only one provider of telephone service. In the case of oil production, there would be only one producer in Mexico, but many competitors providing oil from which Mexico could buy. The newly privatized company would have to compete to sell its goods. It would likely become more efficient than the state run company

because of this competition. 7. This debate is similar to the debate about private versus public education. Public sector production is often associated with higher costs (for both schools and prisons), but there may be other reasons society would prefer public to private provision.

These reasons typically relate to equity considerations. For schools, the main argument is to make sure everyone child has the opportunity for a good education. For prisons, there may be a fundamental conflict between fair and humane treatment of prisoners and keeping costs low. For example, equity might require that prisoners be fed nutritious meals, but giving them bread and water for every meal might be less expensive. This question asks students to give personal opinions about privatizing prisons, so there is no single "right" answer. 8.

The experimental results on free-riding suggest that members of the community might voluntarily contribute about half of the required amount. The reason these citizens wanted to use private fundraising was because the state government redistributed tax dollars from wealthy districts to poor districts (the so-called Robin Hood plan), so using private donations was a way to avoid losing tax dollars to other districts. 9. Books are not a public good. They are both rival (two people cannot read a book at the same time) and excludable (you can keep a person from reading a book).

But if the goods libraries provide are a sense of community or a better educated populace, these would qualify as public goods. If the public good aspect of the library is to produce a better educated populace, then perhaps the classic books are a better choice. 10. Hiring private military firms to provide military support in Afghanistan, Iraq, or Darfur would be similar to

the example of airport security in the text. One might argue that a private firm would not provide adequate training, use unethical or especially aggressive methods to shorten the conflict, thus lowering costs to increase profits.

Proponents would argue that such things could be stipulated in a well-written contract. However, no Part 2 - Public Expenditure: Public Goods and Externalities contract can specify every possible contingency. In high conflict situations this may be especially true as the opposing side will not be predictable.

11. a. Zach's marginal benefit schedule shows that the marginal benefit of a lighthouse starts at \$90 and declines, and Jacob's marginal benefit starts at \$40 and declines. Neither person values the first lighthouse at its marginal cost of \$100, so neither person would be willing to pay for a lighthouse acting alone. Zach's marginal benefit is  $MB_{ZACH} = 90 - Q$ , and Jacob's is  $MB_{JACOB} = 40 - Q$ . The marginal benefit for society as a whole is the sum of the two marginal benefits, or  $MB = 130 - 2Q$  (for  $Q \leq 40$ ), and is equal to Zach's marginal benefit schedule afterwards (for  $Q > 40$ ). The marginal cost is constant at  $MC = 100$ , so the intersection of aggregate marginal benefit and marginal cost occurs at a quantity less than 40. Setting  $MB = MC$  gives  $130 - 2Q = 100$ , or  $Q = 15$ . Net benefit can be measured as the area between the demand curve and the marginal benefit of the 15th unit. The net benefit is \$112.5 for each person, for a total of \$225.

2. Each day the private decision of each fisherman would equate private cost with private benefit. Therefore, 7 would show up because then each fisherman would catch four fish. If the fishermen catch less than four fish, then they will stay home. The net benefits to society are 0 fish (the benefit to the seven fishermen is 4 fish

( $7 \times 4 = 28$ ) and the cost to society is 4 fish per fisherman ( $7 \times 4 = 28$ ). The efficient number of fishermen to show up at the lake is the number that will maximize social net benefits, which happens where the social marginal benefit equals the social marginal cost.

This occurs at four fishermen, where the net social benefits equal 12 fish ( $4 \times 7 - 4 \times 4$ ). Access to the lake is an impure public good. It is rival - if one fisherman has access to the fish, the others have less access. It is, however, non-excludable because it is difficult to keep people from fishing at a lake.

13. Britney's marginal benefit is  $MB_{BRITNEY} = 12 - Z$ , and Paris's is  $MB_{PARIS} = 8 - 2Z$ . The marginal benefit for society as a whole is the sum of the two marginal benefits, or  $MB = 20 - 3Z$  (for  $Z \leq 4$ ), and is equal to Britney's marginal benefit schedule afterwards (for  $Z > 4$ ).

The marginal cost is constant at  $MC = 16$ . Setting  $MB = MC$  along the first segment gives  $20 - 3Z = 16$ , or  $Z = 4/3$ , which is the efficient level of snowplowing. Note that if either Britney or Paris had to pay for the entire cost herself, no snowplowing would occur since the marginal cost of \$16 exceeds either of their individual marginal benefits from the first unit (\$12 or \$8). Thus, this is clearly a situation when the private market does not work very well. Also note, however, that if the marginal cost were somewhat lower, (e. g. ,  $MC = 12$ ), then it is possible that Paris could credibly free ride, and Britney would provide the efficient allocation. This occurs because if Britney believes that Paris will free ride, Britney provides her optimal allocation, which occurs on the second segment of society's MB curve, which is identical to Britney's MB curve (note that Paris gets zero marginal benefit for  $Z > 4$ ). Since Paris is completely satiated with this good at  $Z = 4$ , her threat to free

ride is credit if Britney provides  $Z > 4$ . See the graph below. Chapter 4 -  
Public Goods MBParis MBBritney