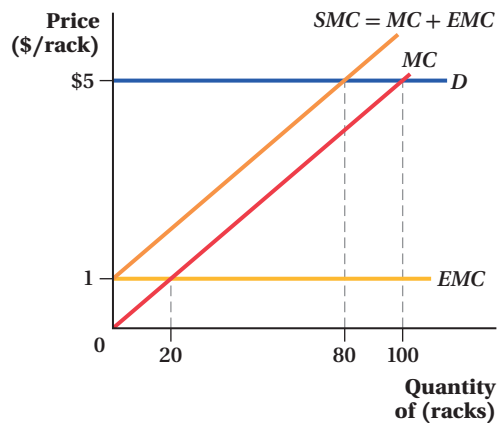
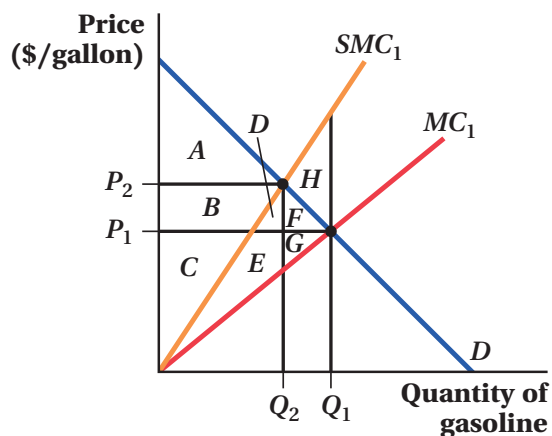


1) Kansas City is famous for its barbeque. But, good barbeque comes at a cost: Pit masters have to bear the costs of producing slow-roasted pulled pork and beef briskets. There is also an external cost: Every time a pit master roasts another rack of ribs, it offends the sensibilities of nearby animal lovers. Consider the graphical representation of a typical pit master in the competitive BBQ industry below:



- a. What is the market price of barbeque?
  - b. How much psychic damage (external cost) do animal lovers suffer for each rack roasted?
  - c. If our pit master accounts only for her private costs, how many racks will she roast? How much total damage will animal lovers suffer?
  - d. If our pit master feels sympathy for animal lovers and wholly considers their feelings in her decision about how many racks to produce, how many racks will she roast?
  - e. Does the decision to consider animal lovers' feelings eliminate the damage they suffer from transactions in the rib market?
  - f. Cutting output *below* the level you determined in (d) clearly benefits animal lovers. Who is hurt by such a decision? Explain why such an output cut would not be Pareto efficient, that is, there is another allocation that would make someone better off without making anyone worse off.
2. Suppose that growing flowers produces both a positive externality (people in the neighborhood get to view the flowers) and a negative externality (the flowers aggravate people's allergies).
- a. True or false, and explain your answer (using a diagram): We can say for sure that too many flowers are being produced.
  - b. True or false, and explain your answer (using a diagram): We can say for sure that the market price of flowers is too high.

3) Gasoline brings great benefit to those who buy it, but burning it also creates external costs. Consider the graph below, which shows the demand for gasoline, the private marginal cost of producing gasoline, and the social marginal cost of producing gasoline.



a. Suppose that buyers and producers of gasoline do not consider the external marginal costs they impose on others. Determine the equilibrium quantity and price; then use the letters in the diagram to fill in the appropriate spaces in the table below:

	External Marginal Cost NOT Considered	External Marginal Cost Considered
Consumer Surplus		
Producer Surplus		
External Damage		
Total Net Value to Society		

b. Suppose that conscientious sellers, out of the sheer goodness of their hearts, decide to incorporate external marginal costs into their production decisions. Determine the new quantity (*Hint*: Use the social marginal cost curve) and price, then use the letters in the diagram to fill in the appropriate spaces in the table on the previous page. (Be sure to remember that producer surplus is the area above *private* marginal cost and below the price, out to the relevant quantity.)

c. Producers rarely do something out of the goodness of their hearts, and are likely to consider only their private marginal costs. Compare total surplus in both cases to determine the deadweight loss of the externality when external marginal costs are not considered.

4. Two pink slime producers, XL and IPSP, are located in an otherwise pastoral mountain town. Each producer emits 30 tons of ammonium hydroxide into the atmosphere each year. City planners wish to cut the level of ammonium hydroxide pollution to 50 tons overall.

a. Alfred B. Packer steps forward with the following suggestion. “Make each firm cut emissions by 5 tons. That seems fair, doesn’t it?” Do you agree? Explain your answer.

b. Suppose that XL and IPSP are both capable of reducing emissions by 5 tons, but that it costs XL \$50, and IPSP \$100, to clean up each ton of emissions. Comment on the fairness of Packer's proposal in light of this additional information.

c. If you were the "King or Queen of the World" and hoped to clean up the ammonium hydroxide at the lowest possible cost, how would you split the burden of the cleanup between XL and IPSP?

d. Suppose the city goes to a tradable permits system for reducing ammonium hydroxide emissions. It prints 50 permits, each of which gives the bearer the right to emit 1 ton of ammonium hydroxide. It then distributes 25 permits each to XL and IPSP, and informs both that they are free to buy and sell the permits to each other.

i. When permits are traded, who will be the likely buyer of permits, and who will be the likely seller? Explain.

ii. What is the lowest price that you expect pollution permits to sell for?

iii. What is the highest price you expect pollution permits to sell for?

iv. When trade is complete, how many permits do you expect to see sold?

v. Under the tradable permits system, how much of the cleanup does XL end up being responsible for? How does this outcome compare to your answer to (c)?

5. Al regularly rehearses accordion music on his back deck with members of his musical troupe, the Starland Polka Band. Practicing on his deck saves him the \$500 per year it would take to rent a rehearsal space. Unfortunately, practicing on his deck keeps his neighbor, Marcy, awake at night. The value of Marcy's lost sleep is \$600 per year.

a. Is it efficient for Al to rehearse on his back deck? Explain your answer.

b. If the law says that it is illegal for Al to rehearse on his back deck, will Al end up practicing there? What might Marcy do to try to stop him?

c. Suppose that the law says it is legal for Al to rehearse on his back deck.

i. How much is Marcy willing to pay to get him to stop?

ii. What is the minimum amount of money Al is willing to accept in exchange for his silence?

iii. If possible, craft a bargain between Marcy and Al that results in his silence. Show that the bargain (if possible) makes both parties better off.

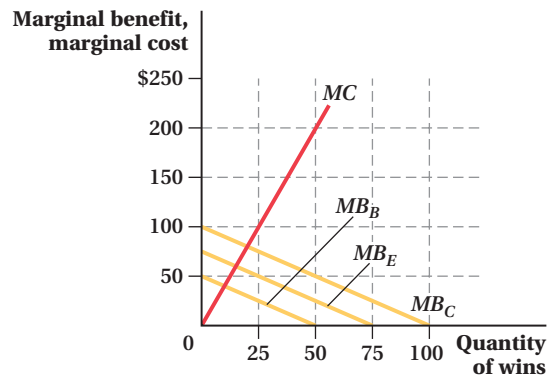
d. Given your answers to (b) and (c), does the outcome of this conflict depend on the law? Is the outcome consistent with your answer to (a)?

e. Suppose that instead of doing \$600 damage to one neighbor, Al does \$1 damage to 600 neighbors. Are those 600 neighbors as likely to be able to convince him to stop as easily as Marcy can? Explain.

6. Classify each of the following goods using these terms: nonrival, nonexcludable, private good, public good, and common resource.

a. Hamburger b. Lighthouse c. Flood control d. Swimming pool e. Park f. Broadcast television g. Cellular telephone service h. Computer software

7. A home-team baseball victory produces benefits for residents (in terms of hometown pride) that is both nonrival and nonexcludable. The graph below depicts the marginal benefits that Beatrice, Edward, and Charlotte (the residents of a very tiny town indeed) receive from home-team wins. The graph also depicts the marginal costs of achieving each victory.



- Draw the total marginal benefit received by hometown residents. Graph your result carefully.
- Determine the socially optimal number of wins. Indicate this amount on your graph.