

External Benefits

We have already considered the case where there were external costs, but there is also the possibility that there are external benefits.

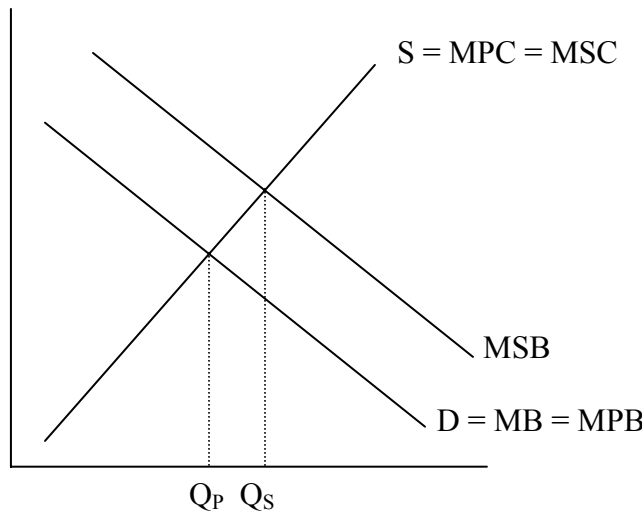
Private Benefits – the benefits of consuming a good that accrue to the purchase of the good (the decision maker). These are reflected in the demand curve of the decision maker.

External Benefits – the benefits of consuming a good that accrue to others who are not the decision maker.

Social Benefits = Private Benefits + External Benefits

Examples. Your neighbor plants flowers. Your neighbor’s demand curve reflects her private benefits of consuming flowers. However, you get to look at the flowers she plants and enjoy them. In fact you get to enjoy the benefits and don’t have to pay for the right to look at the flowers. This would be an external benefit. Of course, when your neighbor decides to plant flowers she does not consider the enjoyment you will derive (she considers only her private costs).

If the student next to you in class made a decision to get a flu shot, this conveys external benefits on you. You are less likely to get the flu as a result. Or think of someone sailing on Lake Hartwell. Some people on shore may enjoy watching the sail boat go by. This is an external benefit. Wearing deodorant may confer an external benefit to those around you. (Notice not wearing deodorant may create an external cost – these concepts are more closely related than you might think).



When decision makers only consider their private benefits, the private solution will result, (Q_p). This occurs where $MPB = MSC$. (We are assuming, for simplicity, there are no external costs now). However, Q_p is inefficient. At Q_p , the MSB of consuming the good is larger than the MSC . Not enough of the good is being consumed. There are unexploited gains from trade (a DWL). We should consume more. Of course, the socially efficient solution occurs where $MSB = MSC$. This is labeled Q_s . Can you shade in the DWL ? It is the area between Q_p and Q_s , between the MSB curve and the MPB curve.

How do we solve the problem? Somehow we need to increase Q.

1. Subsidize
2. Regulate
3. Coase Theorem / Property Rights

1. **Subsidize.** This works just the opposite as external costs did. In this case, there was too much of the good being produced and consumed. We wanted to reduce the equilibrium quantity so we taxed.

Now we want to increase the quantity. Thus we should subsidize. Now, if you go and get a flu shot, Uncle Sam will send you a check for \$2. Or perhaps Uncle Sam can lower the rental price on sailboats, etc. Subsidies lower the price that consumers pay inducing them to consume more, while also increasing the price that producers receive, inducing them to produce more.

Might this be why we see subsidized student loans? Could it be that there are external benefits to higher education? How about the knowledge obtained in research on cancer and AIDS? Redfern seems to subsidize flu shots for CU students.

2. **Regulate.** Write a law that requires that people produce Q_s . All people who are Business majors must get a flu shot. If you own a sailboat, you must produce Q_s of sailing units or go to jail.

Might this be why we see mandatory education for people under the age of 16? (There are other arguments, but is this suggestive?)

3. **The Coase Theorem** / Property rights solution is tough when it comes to external benefits. It might be tough to define property rights to the right to look at your neighbor's flowers or the right to look at the sailboat. Or define the property right for the air around your (now dainty) armpits. We will have a free-rider problem (more later on this later) precisely because it is difficult to define these property rights (also more later on excludability). Should we build a giant fence around the lake?

This is tough. How many times have you paid your neighbor to plant flowers? Have you ever paid someone to go sailing? Probably not, but you might have purchased some deodorant for your stinky roommate.

Public Goods

Suppose there are 40 people who live in 211 Land. The cost of building a bridge is \$70. Let's also suppose that everyone values the bridge at \$3. That is, they are willing to pay \$3 toward building the bridge, but the mayor of Econ 211 Land is unaware of this, as are all of the other citizens. Everyone only knows that they have a \$3 value. If the bridge is built, everyone will be able to use the bridge and there will be no tolls. Even those who did not pay for the bridge will be allowed to cross it (see the info about non-excludability later in the notes).

First off, we know that society will be better off if the bridge is built. The bridge has a social value of \$120, and social cost is only \$70. It makes sense to build the bridge. It is efficient to do so. It would be inefficient to not build the bridge.

Now, suppose the collector goes around and ask each citizen of 211 what they are willing to pay to build the bridge. Some people will be unwilling to reveal the amount of money they will pay for the bridge. For instance, I might say I value the bridge at \$0. Thus, I won't have to pay anything for the bridge. I am hoping enough other people are willing to pay for the bridge and the bridge will be built. Then I will get to enjoy crossing the bridge without having to pay for it.

Let's say, for simplicity, there are two answers people give the collector. The either offer to pay \$2 (leaving them with \$1 of surplus) or pay \$0 (leaving them with \$3 of surplus). Of course, if the bridge is not built, the money is refunded, and everyone ends up with \$0 surplus. It turns out that we'll need 35 people to pay \$2 to come up with the \$70 required to build the bridge. Or put differently, if more than 5 people pay \$0 (to try and get \$3 surplus), no bridge is built and everyone ends up with \$0 surplus. The numbers and set up seem familiar? (In class for us, we needed many people to "pay for the bridge" and 4 or fewer people to "pay \$0" in order to get the extra credit (to "build the bridge"). If there were too many

3s written down, there was no extra credit. If there are too many people who refuse to pay, there is no bridge.

As in class, the first time through the bridge was not built because there were too many people that were unwilling to pay for the bridge. These are people called **free riders**, people who are unwilling to reveal their willingness to pay for a public good. The point is that some people will attempt to free ride. They do not pay for the bridge, even though they value it, and hope others will pay. As in the first case, so many people were free riders that the result was the project wasn't completed, even though it was efficient to do so. Again, this free riding caused an inefficiency, as the bridge wasn't built.

Some other mechanism must be provided to get people to be willing to pay, to reveal their value. In class I used public shame (names on board). The next step was to threaten physical violence to free riders. Though it seems strange to threaten physical violence on non-payers, I would claim this isn't that different from governmental tax collection. What happens if you don't pay your tax bill – some men with guns ring your doorbell. What happens if you still don't pay? Does the government threaten physical violence against you if you refuse to give them money (to spend on public goods)?

Can I have some more terminology? Sure, I am glad you asked.

Non-rival – a good is non-rival if the quantity available for other people does not fall when someone consumes it. Examples are public radio, a movie, and national defense. If one more person flips on NPR, it doesn't cause anyone else to have to reduce the quantity of NPR they consume. One more person in a movie theater (let's ignore the possibility of blocking someone else's view) doesn't reduce the amount of movie that I get to watch. One more person coming in the US doesn't reduce the amount of national defense I consume.

However, someone eating a piece of chocolate cake does reduce the amount of cake available for others. Cake is not a non-rival good.

Non-excludable – a good is non-excludable if it is prohibitively costly to provide the good to only those people who pay for it (exclude others who didn't pay from obtaining it). Examples include public radio, national defense, a public beach. Even if I claim I don't want national defense, it is difficult for the government to exclude me from the benefits of national defense. Anyone can turn on his or her radio, even those who didn't donate to NPR. A public park is just that, anyone can come. A movie however is excludable – you can prevent people from coming into the movie theater.

We say that a good is called a **public good** if it is both non-rival and non-excludable.

The problem with a public good, particularly because it is non-excludable, is that is difficult to get people to reveal their willingness to pay. Since we would allow anyone to use the bridge if it was built (it was non-excludable), people have an incentive to say they didn't value the bridge. This is called the **free-rider problem**, as alluded to earlier. If not enough people are willing to pay, we don't provide the public good, even though it was efficient to do so.

How do we overcome the free rider problem? It is very difficult in some cases to get people to reveal their willingness to pay for a public good. Here, the government can do something good for us. Essentially, one way to solve the problem, is to have the government tax the citizens and provide the public good. In our example, they would increase taxes \$70 and build the bridge. We eliminate the free-rider problem, as everyone must pay taxes. There are more complex ways to do this (make people reveal) that are interesting, but beyond the scope of 211.

Thus, the argument can be made that the government should tax us and provide us with public goods. The government should provide national defense, public roads, education?, etc. We could say the government has a comparative advantage in providing public goods.

There are some problems. Suppose everyone is taxed the same amount. Is this perfect or even fair? Some people may actually have a higher value on the bridge than others. Shouldn't they be taxed at a higher rate? What about the person who really didn't value the bridge at all? Should they have to pay? Should rich people have to pay for more public goods than poor people?

A bit on excludability

The real problem with public goods is that they are non-excludable. That is, it isn't the fact that a public good is non-rival that causes the problem. Think of a football game or a movie. Ignoring the possibility that the stadium is jam-packed, one more person walking into the stadium or theater doesn't reduce the amount of "football" or "movie" I get to consume. In fact, we don't see the government involved in producing "football" or movies. That is, private companies (not the government) are successful at supplying non-rival goods. It must be non-excludability that is the problem.

Remember, if a good is non-excludable, it is impossible to prevent people who did not pay for the good from consuming the good. Think of NPR. It doesn't matter if you contribute to their telethon or not – you can still listen to NPR. Perhaps an interesting question is why anyone contributes to NPR. (Does this have anything to do with them announcing your name on the TV or sending you a mug?) If you can't keep people who don't pay for your good from consuming it, how do you expect to make a profit? That is, if it was legal for people to come and snatch burgers from Burger King all day, do you think Burger King would be a profitable enterprise?

Suppose we tried to build the bridge again but this time only those who contributed could use the bridge? That is, some pass would be used to exclude those who didn't contribute. Might it be easier to generate the \$70? Would people be willing to reveal their willingness to pay if they would be excluded from using the bridge if they didn't buy a pass? That is, what happens if the bridge is now excludable? I think we'd have an easier time getting people to reveal how much they are willing to pay.

Free riders – the scum suckers of the earth?

While it is true that the free-rider problem sometimes causes us to not complete projects that are socially beneficial, it is not as though these people are "evil". It is an example of a situation when the incentives of one person cause them to take actions that end up being less than optimal from the group as a whole (the societal level).

This isn't any different than the "evil price searcher" from restricting output to raise profits (wouldn't you do the same if you were a monopolist?)

If I had been in class offered the 3 and the 1 game, I would have chosen 3 every time.

It's not so evil to be a free rider, it's fun. Try free riding with your roommate. Next month, when the cable bill comes, tell your roommate that you don't want cable any more. Tell him that you don't value cable and are unwilling to pay for it. If all goes well, your roommate will continue to buy cable (paying the whole \$40) and you'll get to enjoy free cable. Isn't free riding grand? Of course, continue to watch your favorite shows.

However, there is a chance your roommate doesn't value cable enough to purchase it buy himself (his value of cable is less than \$40), in which case you'll need to be renting some movies (or you can change your mind and continue to pay your half of the bill). The bridge didn't get built.

Or maybe your roommate will understand excludability. He will realize that you are just trying to free ride. He knows that excludability is the key. If he can keep non-payers (you) from watching cable, there will be no incentive to conceal their willingness to pay. Thus, he will pay for the cable, but not allow you in the room when the TV is on.

If this is true, your roommate is a jerk; maybe it's time for a new roommate anyway. Really, this works better with magazines. "Oh no, I don't like to read Glamour and I will contribute \$0 towards its purchase. Sorry, I don't like Sports Illustrated either, particularly not the swimsuit issue." Of course, read them, write your answers in on the quizzes, and ...

One more tidbit about that 1s and 3s

That whole ditty can be viewed in a cartel framework. If everyone writes down 1, the cartel is successful and every member gets \$1 worth of profits. If only a few people "cheat" and write down 3, the cheaters get higher profits and the cartel is ok. However, if a bunch of people "cheat", the cartel breaks down and everyone is back to 0 profits (no bridge). More later...

So, really, these are two situations (public goods and cartels) where the incentives of individuals don't necessarily coincide with the incentives of the group as a whole (society and the cartel – incidentally this works out well for society when it comes to the cartel, but not so well for the public goods).

This will come up over and over again, especially so when it comes to international trade, and voting and political economy stuff a bit later. It is pervasive.

What can I read?

O' Sullivan and Sheffrin, p. 331 - 333 (307-313 in the 2nd edition). Read about the 3-sided clock tower, an interesting application of excludability and free riders, which I think is hilarious. Decent stuff on public goods here. They miss the boat by not-mentioning excludability, as they sort of kind of lump it in with being non-rival.

Unless you're adventurous, I would stay away from Chapter 17 on external costs. You may find yourself a tad confused. Instead of talking about total pollution for various levels of output (7 gallons of sludge if you produce 14 units), they talk about units of pollution per unit of output (1/2 gallon per unit of production). This can cause some confusion. Stick with me and my notes, you'll do fine.

Extra Credit

Someone told me it was **always** better to write down a 3 (compared to writing down a 1) in the game we played. Is this true? Can you think of the one exception to the rule? Tell me, and you'll get some points. This leads into something called game theory we'll study later?