

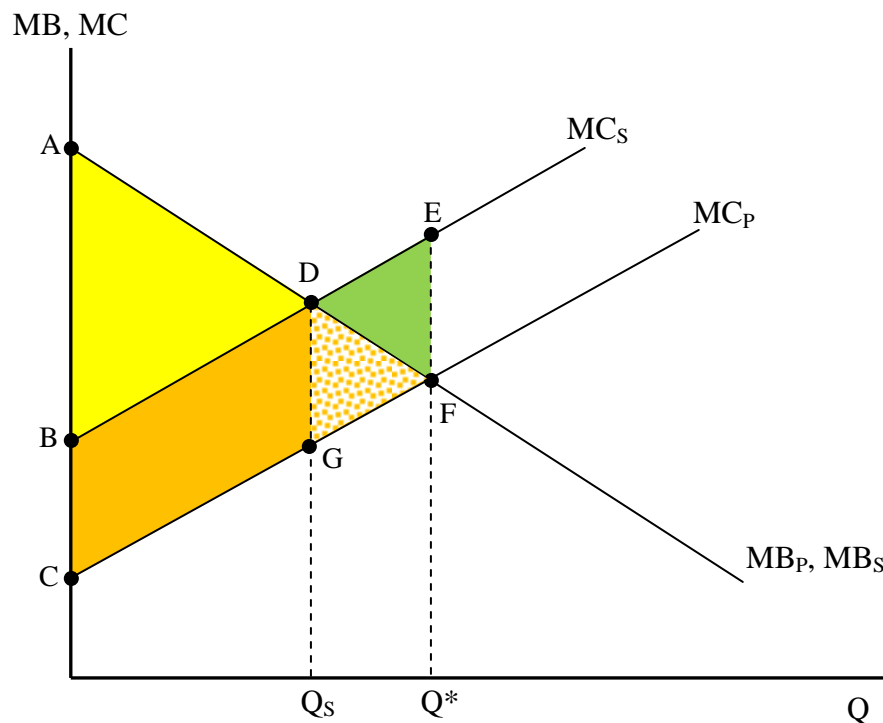
Coase Theorem Example

Econ 201/Haworth

The Coase Theorem tells us that if transaction costs are low and property rights well defined, then we can internalize (resolve) problems of externality. I.e., we can get society the outcome that society prefers. The theorem itself is an alternative to government intervention, something we could refer to as a *private sector solution* to the problem of externality.

Let's assume there's a negative externality created by a lawnmowing firm who produces output level Q^* , an amount that is greater than the output society prefers (Q_S). The firm's output choice reduces society's total surplus below what would be possible if the firm produced at Q_S and creates an area of deadweight loss (green triangle-area DFE).

Recall from above that the external cost is the difference between MC_S and MC_P , from Q_S to Q^* (i.e. the overproduced units of output). I.e., external cost is the parallelogram-like area DGEF in the graph below (dotted orange triangle + green triangle).



What if the lawnmowing firm chose to voluntarily produce Q_S instead of Q^* (i.e. voluntarily do what society prefers)? Reducing output from Q^* to Q_S would cause the lawnmowing firm to lose an area of net benefit represented as the difference between MB_P and MC_P from Q^* to Q_S . That would correspond with the orange dotted triangle-area DGF. Note that the amount of net

benefit lost by the firm would actually be even less than DGF if we consider only what might be the producer surplus associated with the lawnmowing firm's output.

Note that $DGFE > DGF$, which tells us that the loss associated with the lawnmowing firm voluntarily producing less (the problem created for the firm by the firm doing what society prefers) is less than the external cost (i.e. the problem created for society by the firm not doing what society prefers). This suggests that there will be room for negotiation.

Assuming no government involvement, how might we resolve this externality?

Let's consider the options that could potentially lead to resolving this problem of externality, and operate under the assumption that the transaction costs of resolving this problem are zero and the property rights (here) belong to the lawnmowing firm. This latter assumption implies that the restaurant must do something if the restaurant wants to eliminate this externality. I.e., the lawnmowing firm is not obligated to do anything at all.

Assume that these are two possible solutions:

1. The restaurant could do nothing and the external cost would continue. Let's assume that this external cost is \$200 per period.
2. The restaurant could build a barrier that blocks out the noise, but also reduces the view that customers would otherwise have when eating on the outdoor patio. We'll assume that the barrier will cost \$500 per period to build and maintain.

If these were the only options, then the externality would not be resolved and the Coase Theorem would be wrong.

Based on our discussion above regarding areas $DGFE$ and DGF , there is apparently one more option. The restaurant could ask the lawnmowing firm to reduce output to Q_s , produce what society prefers, and eliminate the external cost. Of course, the lawnmowing firm has no incentive to accept that option, since the option would lower the lawnmowing firm's net benefit.

What if the restaurant offered to compensate the lawnmowing firm, however, for this loss of net benefit. Above, we assumed that area $DGFE$ (the external cost) is \$200. We know that DGF is clearly smaller than that, so the compensation here would be less than \$200. When faced with a choice of losing \$200 by doing nothing and paying some amount less than \$200 to eliminate the external cost of \$200, the firm would clearly choose to make the payment. As a result, the externality is resolved when the firm produces Q_s .

What we realize from this example is that if $DGFE$ is **always** larger than DGF , the externality will always be resolved, no matter what the cost of any other potential solutions. I.e., the Coase Theorem will always hold as long as transaction costs are low and property rights well defined.