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Economics 201

Applying the Coase Theorem

By definition, an externality exists when there is either external benefit or external cost created during the consumption or production of some good. These are ultimately problems associated with individuals not being properly compensated for the harm they incur or benefit they create, which implies that society is not getting the outcome society prefers. There are two approaches to dealing with this problem: (a) **the public approach**, and (b) **the private approach**.

(a) **The public approach** involves the government intervening in a market with specific regulations, taxes or subsidies that solve the problem of externality.

(b) **The private approach** occurs when the individuals affected by an externality negotiate with the creator of the externality to solve a problem of externality without government intervention. This approach is an application of the Coase Theorem, which states that *if property rights are well defined and transactions costs are low, private parties can internalize an externality*.

Let's define some of these terms:

- 1) **Property rights** establish legal ownership of a resource and specify the ways in which the resource may be used.
- 2) **Transactions costs** are the costs of "doing business" or engaging in a transaction in terms of the time it takes to perform that transaction (e.g. cost of communication, coordinating the decisionmaking involved in a transaction, etc.).
- 3) **Internalizing an externality** is the situation that exists when an externality is eliminated and production or consumption occur where society's net benefit is maximized.

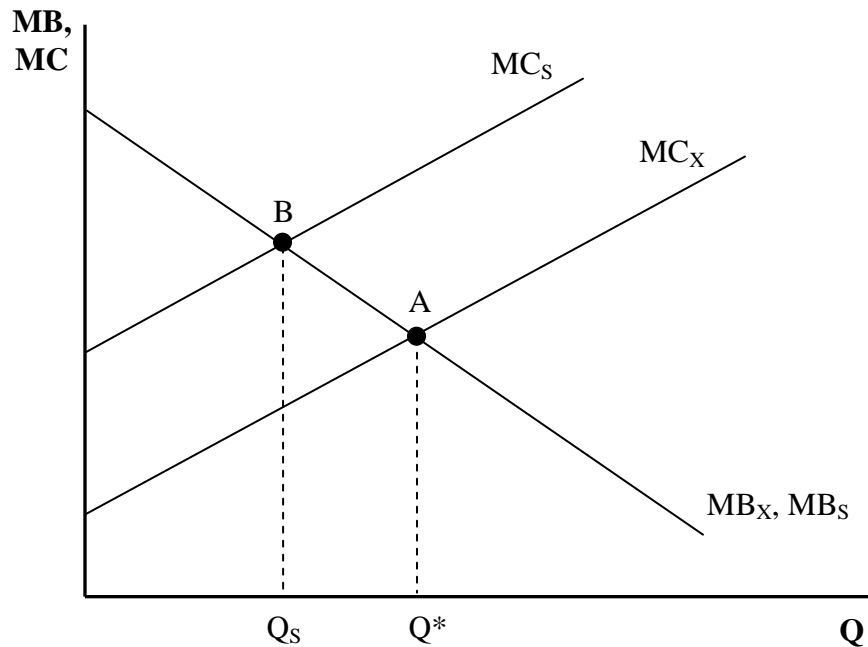
Consider the following example:

Firm X locates next to a lake and produces widgets. Rather than pay for waste removal, Firm X dumps their waste into the lake. This pollution affects local anglers, anglers who earn their livelihood from selling the fish that they catch from the lake, as the waste kills enough lake fish to lower the profit of these anglers.

Question 1: What type of externality is this?

This is a negative externality. When we consider the marginal benefit and marginal cost to society associated with producing widgets, we note that society bears a cost that should be paid by Firm X.

In the graph below, we see that Firm X will maximize their net benefit by producing Q^* , which is where their (private) marginal benefit and (private) marginal cost, MB_X and MC_X , are equal, and not Q_S , which is where Society's marginal benefit (MB_S) and marginal cost (MC_S) are equal (and which maximizes Society's net benefit).



Note that $MC_S > MC_X$, because a cost is being imposed on local anglers that is not included in MC_X since Firm X is not compensating the anglers for their lost profit.

Question 2: How do we internalize this externality?

Let's assume that pollution control is available which can reduce the emission of toxic waste and prevent fish from dying, something that would eliminate the negative externality. Of course, there are other options for resolving this problem as well. E.g., Firm X could choose to produce at pt B instead of pt A. Lastly, let's assume that the conditions of the Coase Theorem are met in this example (i.e. property rights are well defined and transaction costs are low).

If it was determined that local anglers had the property rights in this situation, then Firm X would be obligated to change behavior and eliminate the negative externality. Firm X could not simply choose to continue dumping waste in the lake without compensating local anglers for the damage created by that pollution. The firm would compensate the anglers for their loss, produce at pt B (where society's net benefit is maximized), or buy pollution control, all of which internalizes this externality.

If Firm X had the property rights in this situation, then the outcome is not as straightforward. E.g., if pollution control had a cost of \$1500 per period and the loss to anglers was \$2000, then local anglers would have an incentive to pay for pollution control on behalf of the firm, but if pollution control costs \$2000 and the anglers loss is \$1500, then local anglers would not have an incentive to do so. Does this imply that we cannot internalize the externality here?

Note that this externality can be internalized if Firm X reduces output from Q^* to Q_S , but that doing so would impose a cost on Firm X (i.e. Firm X would lose profit). If local anglers lose \$2000 each period, then we know that the anglers should be willing to pay up to \$2000 in order to eliminate their loss. E.g., they'd spend \$1500 on pollution control if doing so meant eliminating their \$2000 loss.

Note also that Firm X has no incentive to voluntarily reduce output to Q_S , as doing so would entail the cost we mentioned above, but if the loss to Firm X from reducing output from Q^* to Q_S is less than the loss to local anglers from the firm producing at Q^* instead of Q_S , then we have room for negotiation between these two parties. As per our comments in the paragraph above, local anglers would have an incentive to ask Firm X to produce at Q_S and then compensate the firm for the loss associated with doing so.

If we evaluate the graph above, then it's possible to see that this outcome is always possible, which means that the negative externality can also be internalized when the firm has property rights.