

## Externalities : (a) Introduction

An externality is an action by a person ( or a firm ) which affects another person ( or firm ), and for which this interaction is ignored.

A couple of important aspects of that definition are worth mentioning. First and foremost, an externality does not necessarily arise whenever there is some interaction between people's behaviour. What makes the interaction an externality is that the interaction is not **internalized**. For example, suppose that some person works in a factory, owned by another person. The behaviour of the first person (the worker) certainly will affect the profits of the factory owner. But this interaction is **not** an externality — at least if the first person is an employee of the factory. The fact that there is an explicit contract, in which the worker is paid for her labour, and required to do certain tasks at the factory, internalizes the externality. Similarly, the relation between a car company, and the company that manufactures the steel used in the cars, is **not** an externality. The interaction between these companies involves market transactions : the car company buys the steel from the steel company. And market transactions are not externalities.

As another example of an interaction which is **not** an externality, consider an interaction which is — very very misleadingly — sometimes described as a “pecuniary externality”. [“Pecuniary externality” is a term which I find very very confusing, and do not like to use. I mention it only because some textbooks do persist in using it.] A construction company, and a car company are both big users of steel (for girders and beams in buildings, and for car bodies, respectively). They both purchase their steel on the open market, from steel producers. So what happens when the construction company expands its activities, by building more high-rise buildings? It buys more steel. Suppose, for simplicity, that the market for steel is a competitive one, with many buyers and many sellers. The increased activity by the construction company shifts right its demand curve for steel : the more buildings it puts up, the more steel it demands, holding constant the price of steel. So increased activity by the construction company shifts right its demand curve for steel. That means that the entire market demand curve for steel (the horizontal sum of all steel buyers' demand curves) shifts right. In a competitive market, the shift right in the aggregate demand curve will increase the equilibrium price of steel. So the price of steel paid by all steel consumers — including the car company — goes up. So there is an interaction between the construction company, and the car company, due to their both using the same product (steel) as an input. An expansion of activity by the construction company will hurt the car company, by driving up the price of steel, which the car company buys as an input. This is **not** an externality, since the interaction is “priced out” by the market. In a sense, the construction company is taking account of its interactions with other steel consumers when it makes its decisions about how much steel to buy : it has to pay for the steel it uses, and in a competitive market, the price it pays equals the value of the steel it uses.

So what makes an externality an externality is that the parties to the externality do not take account of their interaction. If a firm dumps some of its trash on someone else's property, it's not

an externality if the firm has negotiated an agreement with the owner of the neighbouring property. Affecting someone else, and **neglecting** this effect, is the externality problem.

Another aspect of the above definition which is worth repeating is that an externality can occur among people, or among firms, or between people and firms. That is, if one person's playing loud music bothers the person's neighbours, that's an externality, between two people. If one firm's training of its workers benefits other firms who might later hire some of those workers, that's an externality between firms. If one person's holding a yard sale affects a firm trying to film a movie on the same street, then that's an externality between the person and the firm.

So the party (or parties) causing the externality could be a person, or a firm, and the party or parties affected by the externality could be a firm or people (or both). But **be warned** : classifying parties involved in an externality as "causing" on the one side, and "affected by" on the other side, is very misleading as well, in many circumstances. That is, the behaviour of the victim of an externality may matter here, as well as the behaviour of the perpetrator.

Two paragraphs above, one of the examples of an externality was a firm's training of workers benefitting some other firms. That's an example of a **positive** externality : the more training the first firm undertakes, the higher the profits of the other firms will be. So externalities can be negative or positive. There still is an externality problem when the externality is beneficial : as long as one firm's (or person's) actions affect another firm or person, and these effects are not internalized, then there will be an externality problem, and the overall allocation of resources in the economy will be inefficient.

Externalities could be reciprocal : the effluents emitted from firm 1's production might lower the profits of firm 2, at the same time as the effluents emitted from firm 2's production lower the profits of firm 1. Reciprocal externalities do not "cancel" : there will be an externality problem here if these effects are not internalized, even if the damage done by firm 1 to firm 2 is exactly the same magnitude as the damage done by firm 2 to firm 1.

A classic example of an externality is pollution. This of course is a negative externality. The effects of the polluting firm's production are a reduction in the utility of people subject to the pollution. But there are many other examples of positive externalities, in addition to the one mentioned above ; many involve a firm or person providing goods which have some **public good** aspects, so that other firms or people can free-ride. [For example, skills learned by workers at one firm may be like public goods, in that other firms cannot be excluded from the benefits of these skills.]

If a firm producing a negative externality is not charged for the harm its activities impose on others, then it will undertake those activities at a higher level than is efficient. On the other hand, if a firm producing the positive externality is not paid for the benefit its activities impose on others, then it will undertake those activities at a lower level than is efficient.

The two main theoretical points about externalities : One, there is an **efficiency problem**, that the competitive equilibrium is not Pareto optimal, whether the externality is positive or negative, if it is not internalized properly. Two, the problem stems from the fact that the agent

(firm or person) producing the externality does not face prices that reflect all the consequences of its actions at the margin. **R. H. Coase**, whose work will be considered shortly, might modify that second point to make it “the agents” rather than “the agent”, to take account of this (valid) argument : when noise from an airport annoys nearby residents, the externality results from the actions of the airplanes landing at the airport, **and** as well from the residents choosing to locate near the airport.

An important category of externality in which several agents cause the damage to each other is the **common property resource**. Classic examples are fisheries, and oil pools. The externality in the latter case arises if several firms can drill on land they own over the same underground oil pool. Then one firm’s well can remove oil from the whole pool, thus reducing the potential yield of any other firm’s well. If no arrangement is made to internalize this externality, then excessive drilling activity takes place, as each firm drills and pumps as fast as it can, to prevent its rivals from pumping up the entire pool. Similarly, the level of fishing activity off both of Canada’s coasts is inefficient, as boats from different countries attempt to harvest fish from the same biomass, reducing the future yield in an attempt to get the fish before the next boat does.

The problem in those examples is that there is a resource to which many firms have access, but which no single firm owns. If a single firm owned the entire oil field, or the entire fishing area, then that firm would have incentives to exploit the resource in the most efficient manner. For instance, if I owned a lake full of fish, there would be no incentive to over-fish, to kill off the entire stock of fish for the sake of my profits. By doing so I reduce the value of future profits, which also belong to me if I own the lake. Alternatively, inefficiently fast extermination of the fish will reduce the resale value of the lake. On the other hand, if no individual owns the lake, but many firms can fish there, then each has an incentive to over-fish, since if they do not then someone else will.

Actually, air and water pollution can also be viewed as well as common property resource problems. The air or water I pollute does not belong to me, so that I have no direct incentive to take into account the implications of my pollution for the value of that air or water. Of course, having the entire resource under the ownership of a single firm is not always a practical solution to the common property resource problem. With pollutants carried by high atmospheric winds all over the continent and the planet, assigning ownership to the air is not sensible. Nor is it practical for pollution of the ocean, or over-fishing of the Atlantic fisheries. But framing the problem this way is often useful.