

Externality

Externality is a problem that violates the first principle of fundamental welfare theorem and causes the market economy to deliver an outcome that does not maximize efficiency. Externality is an condition where the actions of one party make another party worse or better off, yet the first party neither bears the costs nor receives the benefits of doing so. It is an economic activity where the results in social cost that is not borne by either the producer or the consumers. Externalities can result from either production or consumption. Consumption (production) externalities occur when a second person is affected by your consumption (production) of a good or service, either positively or negatively, even though that person (or often, many persons) is not a party to the transaction leading to your consumption (production).

Weak Rivalry

<p>Club goods/local public goods</p> <ul style="list-style-type: none"> *outdoor concerts * public buildings *movies (theatre) Public parks, recreational facilities *libraries *indoor concers *limited access highways *beaches/beach access *police and fire protection *recreation facilities *parking space 	<p>Public goods</p> <ul style="list-style-type: none"> *sunset *lighthouse, street lights *defence *environmental quality *lake, rivers *television
<p>High Excludability</p> <ul style="list-style-type: none"> *houses, cars *tennis courts, swimming pools *food, clothing *personal services (haircuts, medical care) <p>Private Goods</p>	<p>Low Excludability</p> <ul style="list-style-type: none"> *education *garbage pickup *sewer service <p><i>Goods With Externalities</i></p>

High Rivalry

Typically, when there are **positive externalities** from either consumption or production, it is very diffi cult to exclude non-payers from receiving those benefi ts. That's why externalities appeared in the high rivalry, low excludability part of Figure. Externalities typically result from what we think of as basically private

activities with side-effects (costs or benefits) that we cannot easily prevent from spilling over to others.

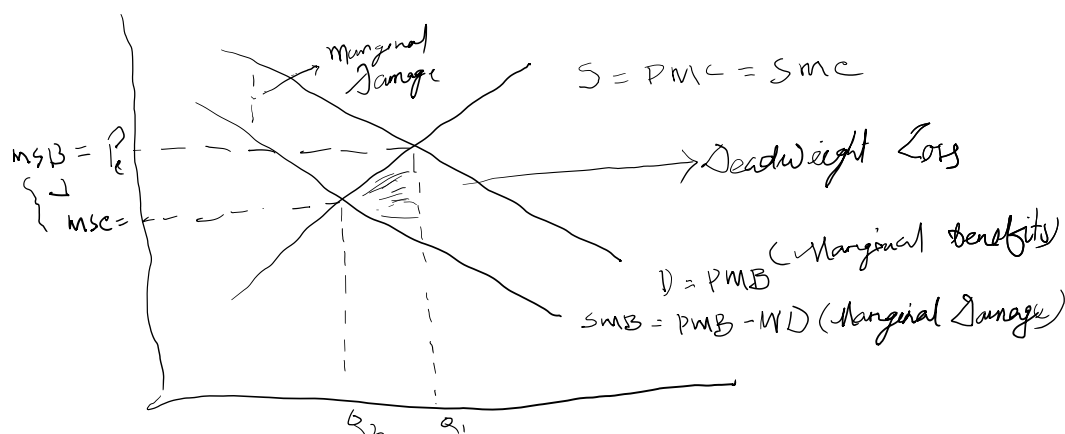
Both consumption and production activities can also generate **negative externalities**. Examples of negative spillover effects can be the encroachment of properties of one another or the roads. In Delhi slum or village area buildings can be seen how the constructions has shrinkaged the roads. Another example is poorly maintained sewer or sewer discharge that affects the passerby or if it is going towards downstream then it affects the downstream water as well. The whole idea of welfare is to reduce the negative externalities and incentivised the positives.

An important characteristic of externalities, positive or negative, consumption or production, is that they are reciprocal in nature. Displacement is the negative cost for the locals where one industry is about to be build. And the demand for higher compensation price or not letting that industry to set up is externality cost for the Industrialist.

The real question is who bears the costs (or reaps the benefits, in the case of positive externalities). Much of the debate about externalities is about the distribution of costs and benefits. The economist's concern is to distribute the costs and benefits in ways that move production toward the level at which marginal cost is equal to marginal benefit, when all costs and benefits are taken into account. As we shall see, there are many ways to achieve that objective.

Externalities are a classic example of the type of market failures.

Negative Consumption Externality

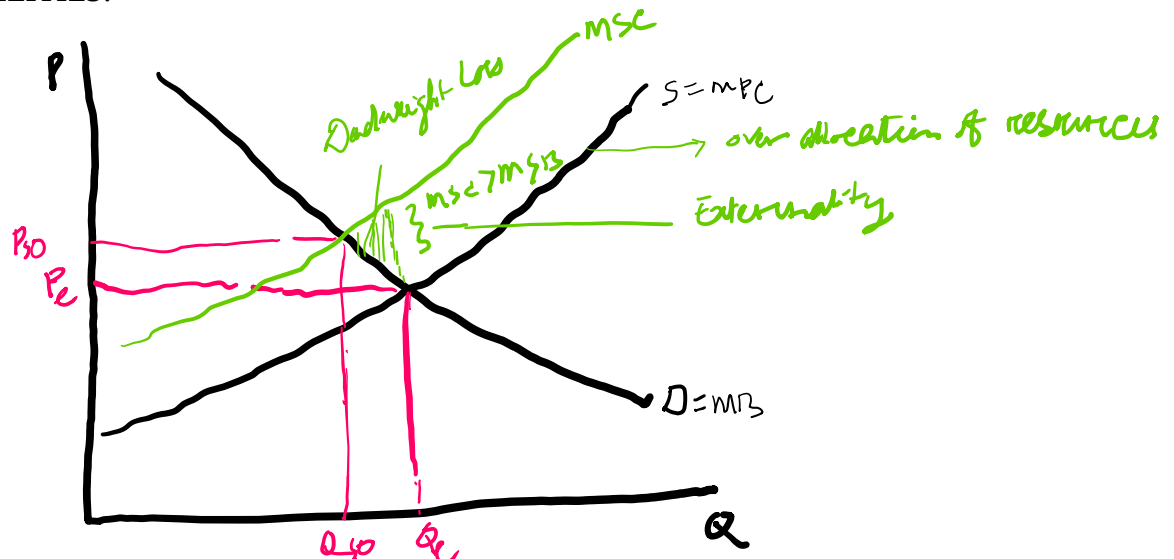


Negative production externality: When a firm's production reduces the well-being of others who are not compensated by the firm. Private marginal cost (PMC): The direct cost to producers of producing an additional unit of a good Marginal Damage (MD):

Any additional costs associated with the production of the good that are imposed on others but that producers do not pay Social marginal cost ($SMC = PMC + MD$): The private marginal cost to producers plus marginal damage Example: steel plant pollutes a river but plant does not face any pollution regulation (and hence ignores pollution when deciding how much to produce)

EXTERNALITY THEORY: ECONOMICS OF NEGATIVE Production

EXTERNALITIES:



When the production of a good creates negative spillover costs passed onto society (environmental cost, health costs and so on)

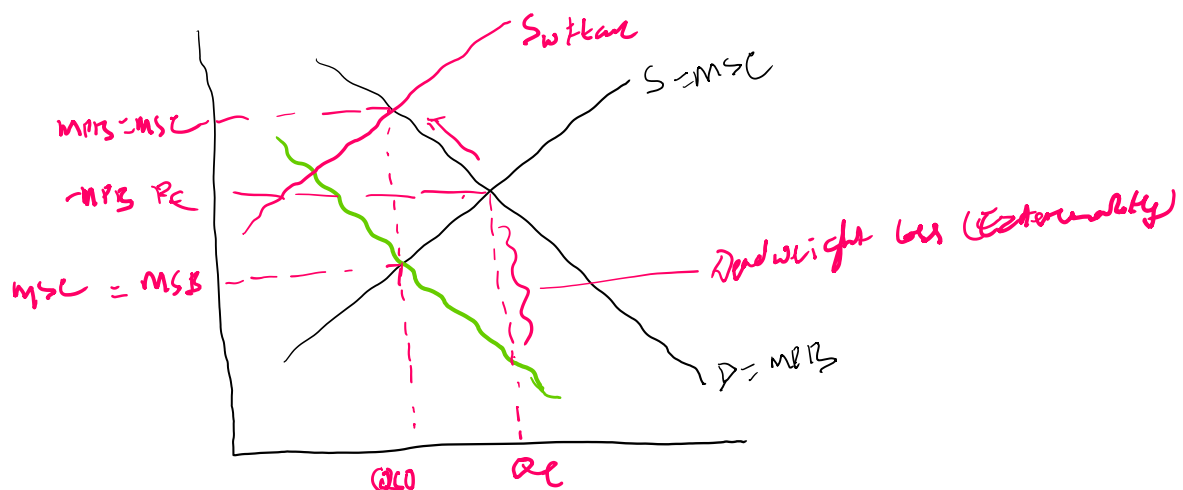
MPC: These are the actual monetary costs to firms of producing good (raw materials, wage costs and other inputs)

MSC: These are the total costs of production borne by society as a whole (include the MPC: and all external costs, such as pollution and health costs)

Qso: The socially optimal quantity of production when all costs are taken into accounts (external and private)

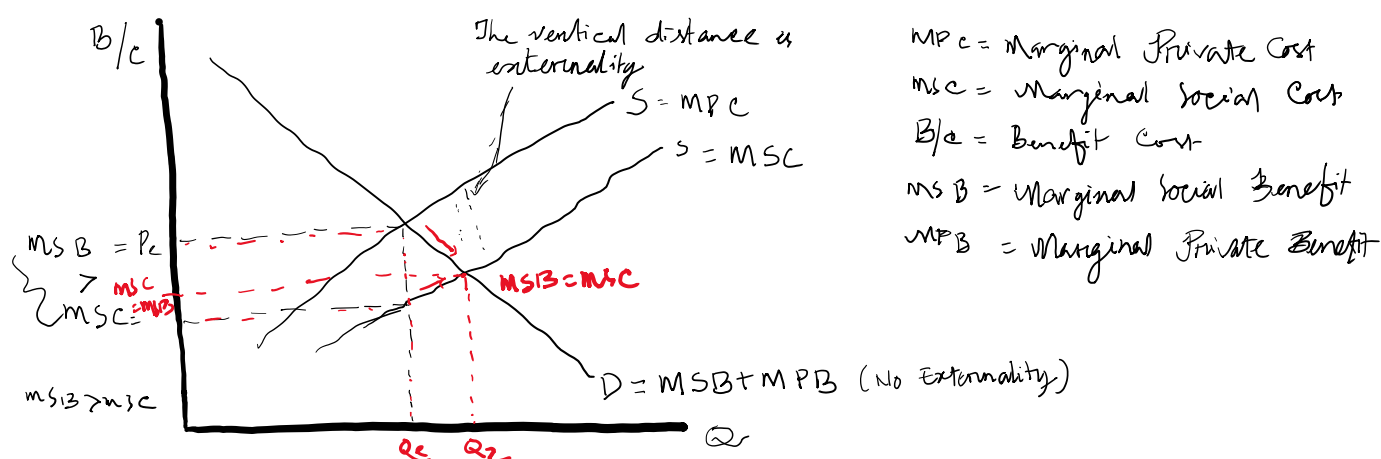
Pso: The price of gas if all costs were taken into account

Dead weight loss-The loss of total welfare resulting from the over-production.



Negative consumption externality: When an individual's consumption reduces the well-being of others who are not compensated by the individual. Private marginal cost (PMB): The direct benefit to consumers of consuming an additional unit of a good by the consumer. Social marginal cost (SMB): The private marginal benefit to consumers plus any costs associated with the consumption of the good that are imposed on others Example: Using a car and emitting carbon contributing to global warming.

EXTERNALITY THEORY: POSITIVE EXTERNALITY



The optimal allocation of resources is where

$$MSB = MSC$$

But here $MSB > MSC$, which represents under allocation of resources.

$MPB - MSB = D - MPB = MSB$ (There are no consumption externalities)
 $MPC \text{ and } MSC \text{ } S = MPC > MSC$

MPB and MSB: $D = MPB = MSB$ (There are no consumption externalities)

MPC and MSC: $S = MPC > MSC$ (The private cost are higher than the social cost (negative external cost or benefit by producing

Q_e & Q_2 : The socially optimal quantity is greater than the equilibrium quantity under free market. Resources are under-allocated towards the production of good with positive externality.

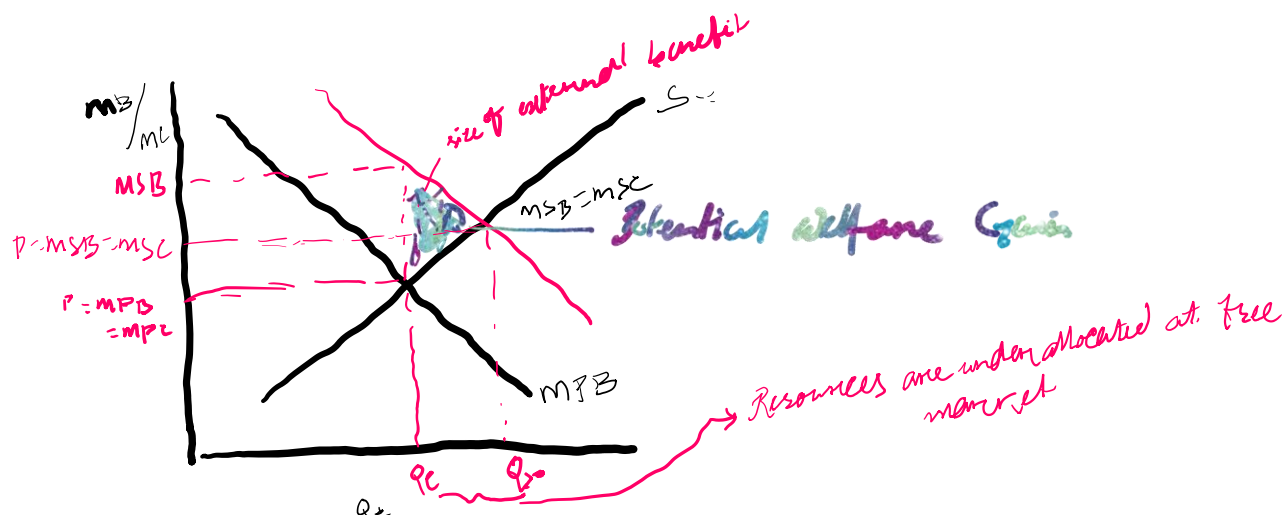
Potential Welfare Gain: This represents the increase in welfare accrued by the society because of the production at socially optimal level (Q_2)

Possible government intervention:- subsidies or incentives to producers to increase their output.

E.G. Medical research, trees planting etc

Positive Consumption Externality

$$MSC = MPC$$



$MSB > MPB$ therefore, free market equilibrium is less than socially optimal equilibrium. There is a potential welfare gain by producing more good and consumed. Market has failed to achieve this social optimal quantity.

Government intervention:-subsidies: Reduce the marginal private cost of good and thereby increasing the supply leading to lower price and increased quantity demanded. Positive advertising

Positive production externality: When a firm's production increases the well-being of others but the firm is not compensated by those others. Example: Beehives of honey producers have a positive impact on pollination and agricultural output

Positive consumption externality: When an individual's consumption increases the well-being of others but the individual is not compensated by those others. Example: Beautiful private garden that passers-by enjoy seeing

EXTERNALITY THEORY: MARKET OUTCOME IS INEFFICIENT With a free market, quantity and price are such that $PMB = PMC$ Social optimum is such that $SMB = SMC \Rightarrow$ Private market leads to an inefficient outcome (1st welfare theorem does not work) Negative production externalities lead to over production Positive production externalities lead to under production Negative consumption externalities lead to over consumption Positive consumption externalities lead to under consumption.

EXTERNALITY THEORY: GRAPHICAL ANALYSIS

One aspect of the graphical analysis of externalities is knowing which curve to shift, and in which direction. There are four possibilities:

- Negative production externality: SMC curve lies above PMC curve
- Positive production externality: SMC curve lies below PMC curve
- Negative consumption externality: SMB curve lies below PMB curve
- Positive consumption externality: SMB curve lies above PMB curve

The key is to assess which category a particular example fits into. First, you must assess whether the externality is associated with producing a good or with

consuming a good. Then, you must assess whether the externality is positive or negative.

Creative solutions:

Determining the optimal level of public good production and allocating the cost appropriately among users is a real challenge to public officials. So is measuring externalities and designing and executing appropriate interventions to move output to the appropriate level and assign the costs to beneficiaries to the extent possible. In the 1950s and 1960s, the standard response to this form of market failure was for the government to produce public goods or goods with substantial positive externalities. For negative externalities, the response was to regulate, forbid, or restrict the production of those externalities, either directly (limits on discharges into the air or water, for example) or through limits on the production and consumption of goods that cause negative externalities (safety regulations, restrictions on access to alcohol, etc.). In recent decades, much attention has been given to identifying existing mechanisms for correcting externalities as well as devising new techniques. They include:

- assignment of property rights (the Coase theorem);
- tax incentives and vouchers;
- educational/informational programs to encourage or discourage certain types of production;
- the development of markets in permits for emissions;
- shifting production to a lower level of government or a nonprofit provider.

PRIVATE-SECTOR SOLUTIONS TO NEGATIVE EXTERNALITIES Key question raised by Ronald Coase (famous Nobel Prize winner Chicago libertarian economist): Are externalities really outside the market mechanism? Internalizing the externality: When either private negotiations or government action lead the price to the party to fully reflect the external costs or benefits of that party's actions.

According to the Coase theorem, in the face of market inefficiencies resulting from externalities, private citizens (or firms) are able to negotiate a mutually [beneficial](#), socially desirable solution as long as there are no costs associated with the negotiation process.

COASE THEOREM EXAMPLE Firms pollute a river enjoyed by individuals. If firms ignore individuals, there is too much pollution 1) Individuals owners: If river is owned by individuals then individuals can charge firms for polluting the river. They will charge firms the marginal damage (MD) per unit of pollution. Why price

pollution at MD? Because this is the equilibrium efficient price in the newly created pollution market. 2) Firms owners: If river is owned by firms then firm can charge individuals for polluting less. They will also charge individuals the MD per unit of pollution. Final level of pollution will be the same in 1) and 2)

THE PROBLEMS WITH COASIAN SOLUTIONS In practice, the Coase theorem is unlikely to solve many of the types of externalities that cause market failures. 1) The assignment problem: In cases where externalities affect many agents (e.g. global warming), assigning property rights is difficult \Rightarrow Coasian solutions are likely to be more effective for small, localized externalities than for larger, more global externalities involving large number of people and firms. 2) The holdout problem: Shared ownership of property rights gives each owner power over all the others (because joint owners have to all agree to the Coasian solution) As with the assignment problem, the holdout problem would be amplified with an externality involving many parties.

THE PROBLEMS WITH COASIAN SOLUTIONS 3) The Free Rider Problem: When an investment has a personal cost but a common benefit, individuals will underinvest (example: a single country is better off walking out of Kyoto protocol for carbon emission controls) 4) Transaction Costs and Negotiating Problems: The Coasian approach ignores the fundamental problem that it is hard to negotiate when there are large numbers of individuals on one or both sides of the negotiation. This problem is amplified for an externality such as global warming, where the potentially divergent interests of billions of parties on one side must be somehow aggregated for a negotiation.

THE PROBLEMS WITH COASIAN SOLUTIONS: BOTTOM LINE Ronald Coase's insight that externalities can sometimes be internalized was useful. It provides the competitive market model with a defense against the onslaught of market failures. It is also an excellent reason to suspect that the market may be able to internalize some small-scale, localized externalities. It won't help with large-scale, global externalities, where only a "government" can successfully aggregate the interests of all individuals suffering from externality.

PUBLIC SECTOR REMEDIES FOR EXTERNALITIES The Environmental Protection Agency (EPA) was formed in 1970 to provide public-sector solutions to the problems of externalities in the environment. Public policy makers employ two types of remedies to resolve the problems associated with negative externalities: 1) price policy: corrective tax or subsidy equal to marginal damage per unit 2) quantity regulation: government forces firms to produce the socially efficient quantity.

PUBLIC SECTOR REMEDIES FOR EXTERNALITIES: REGULATION In an ideal world, Pigouvian taxation and regulation would be identical. Because regulation appears much more straightforward, however, it has been the traditional choice for addressing environmental externalities in the United States and around the world. In practice, there are complications that may make taxes a more effective means of addressing externalities.

In 1920 British economist [Arthur C. Pigou](#) developed a [taxation](#) method for dealing with the goods suffering from externalities. His idea, now known as the Pigouvian tax, is to force producers to pay a tax equal to the external damage caused by their production decisions in order to allow the market to take into consideration the full costs associated with the taxed goods. This process is often referred to as internalizing an externality. Of course, because the amount of the tax must equal the value of the external environmental damage in order to correct for market inefficiencies, the valuation techniques detailed above are crucial in developing a sound tax policy.

This concept can also be applied to goods that suffer from positive externalities. However, in this case a negative tax (or [subsidy](#)) is provided to allow an individual to gain an additional benefit from providing the subsidized good. A common example of this type of subsidy is when an individual receives a tax break for purchasing an exceptionally energy-efficient [household appliance](#).