**Negative Externalities**



Externalities are **third party effects** arising from production and consumption of goods and services for which **no appropriate compensation is paid**. Meaning that the private costs paid by those involved in the transaction, **do not cover** the spill-over effects upon society; the difference between the social cost and the private cost is known as an externality.

**Externalities occur outside of the market** i.e. they affect people not directly involved in the production of a good or service. They are also known as **spill-over effects**.

Economic activity creates **spill over benefits** and **spill over costs** – with negative externalities we focus on the spill over costs.

**Negative externalities**

Negative externalities occur when production imposes **external costs on third parties** outside of the transaction - for which no appropriate compensation is paid.

* Smokers ignore the harmful impact of toxic ‘passive smoking’ on non-smokers
* Air pollution from road use and traffic congestion and the impact of road fumes on lungs
* External costs of scraping the seabed for supplies of gravel
* The external cost of food waste
* The external costs of dropping chewing gum
* The external costs of the miles that food travels from producer to the final consumer

**Private Costs and Social Costs**

The existence of externalities creates a difference between **private and social costs** **of production** and the **private and social benefits of consumption.**

**Social Cost**      =          **Private Cost + External Cost**

**Social Benefit** =          **Private Benefit + External Benefit**

When negative production externalities exist, **social costs exceed private cost.**

**External costs from production**

Production externalities are generated in supplying goods and services - examples include noise and atmospheric pollution from factories. Or dumping waste into a river.

## ****Negative externalities from production – social cost > private cost****



MPB = MSB as we assume that there are no externalities arising from consumption.

Marginal cost or marginal benefit: is the change in total cost or benefits that results from an increase in production or consumption by one unit.

If we focus upon Qe, this is the quantity provided by the free-**market (where demand (MPB) meets supply (MPC)).** At this quantity, MSC is higher than MPC and therefore the difference is the externality (market failure). This applies to all quantities from Qe to Q\*, which forms a triangle – the welfare loss triangle (sometimes known as deadweight loss).

The optimal quantity is Q\* (less than the free-market quantity Qe) – at this optimal quantity, the welfare loss triangle ends because there is no difference between the social cost and the private cost (therefore there is no externality).

The free market fails to take into account the social impacts of a transaction, in order to solve this problem the government may implement a tax – which would reduce supply (shift supply/MPC to the left) and make the Qe closer to Q\* - hence reducing the welfare loss triangle.

**Positive Externalities**

There are many occasions when the production and/or consumption of a good or a service creates external benefits which boost social welfare.

* External benefits from development of renewable energy sources such as wind power
* External benefits from other new production technologies
* External benefits from vaccination / immunisation programmes
* Social benefits from providing milk to young school children
* Social benefits of providing drug/alcohol rehabilitation programmes.

**Positive externalities and market failure**

Where positive externalities exist (merit goods), the good or service may be **under-consumed** or **under-provided** since the **free market may fail to value them correctly** or take them into account when pricing the product (Qe – where demand (MPB) equals supply (MPC)). In the diagram below, the normal market equilibrium is at Qe – but if there are external benefits, the Q\* is an output below the level that maximises social welfare.



But the triangle represents a welfare loss – you are probably wondering why there is a welfare loss on a positive externality diagram.

Well, that’s because Qe (the free-market equilibrium) is below the optimal output of Q\*.

Therefore the under-production and consumption of this good means that there is **lost benefit** – the Marginal Social Benefit is higher than the Marginal Private Benefit at each quantity level between Qe and Q\*. This forms a triangle – the welfare loss triangle/deadweight loss triangle.

There is a case for government intervention in the market, in order to increase consumption towards output level Q\* so as to reduce the welfare loss triangle.

**Brilliant A\*/A evaluation for positive and negative externalities** – we are never sure what the quantity Q\* is exactly and therefore it is difficult for the government intervene, as they do not know how much they need to intervene. For example, drink-driving limit and recommended alcohol units per day varies between countries – no country is exactly sure what quantity (in this case alcohol) Q\* really is.

## Example: ****The economics of vaccination****

Obviously there are benefits for the person receiving the vaccine, they are less susceptible to disease and children in particular are more likely to attend school and earn more income over their lifetime.

In terms of the UK, less disease means the NHS will not have to spend as much and people will not take so many days off work.

More subtly, it can be good for an entire population since, if enough of its members are vaccinated, even those who are not will receive a measure of protection.

That is because, with only a few susceptible individuals, the transmission of the infection cannot be maintained and the disease spread. The dispassionate economic case for vaccination, therefore, looks at least as strong as the compassionate medical one. Spending on vaccination programmes appears to be a sound social investment for the future.

Breakdown of externalities and cost/benefits:

