

Externalities

GCE A-LEVEL & IB ECONOMICS

Slides Structure

- Private, External and Social Costs/Benefits
- Externalities and Market Failure
 - Negative Production Externality
 - Negative Consumption Externality
 - Positive Production Externality
 - Positive Consumption Externality

Externalities

An **externality** is when consumption or production of a good has external effects on 3rd parties, apart from the consumer and producer.

This means someone not involved in the consumption or production of the good is affected positively or negatively.

Externalities are a type of market failure as it misaligns the cost/benefit of consumers or producers with that of society's costs/benefits, disrupting optimal resource allocation in the market.

Does Anyone Recall this Event?



Externalities

To understand this concept and undertake economic analysis on externalities, we need to learn Economic terms describing the misalignment of private and social benefits and costs:

Marginal private benefit (MPB) is the benefit a consumer gains from consuming the next unit of the good.

Marginal social benefit (MSB) is the total benefit society gains from consuming the next unit of the good.

Marginal private cost (MPC) is the cost a firm incurs from producing the next unit of the good.

Marginal social cost (MSC) is the total cost society incurs from producing the next unit of the good.

External Costs & Benefits

MSB includes MPB but also the additional benefits to society of consuming or producing one extra unit of the good. The additional benefits are called **external benefits**

Marginal Social Benefit = Marginal Private Benefit + Marginal External Benefit

MSC includes MPC but also the additional costs to society of consuming or producing one extra unit of the good. The additional costs are called the **external costs**

Marginal Social Cost = Marginal Private Cost + Marginal External Cost

Externalities Example



The private cost of extracting oil to oil companies is lower than the social cost to society. When an oil spill happens, many third parties are adversely affected (e.g. fishing & tourism industries, wildlife seers).

The oil companies do not have to pay these third parties when extracting the oil. Hence, oil companies tend to overproduce (extract) oil despite society may prefer for them to produce less.

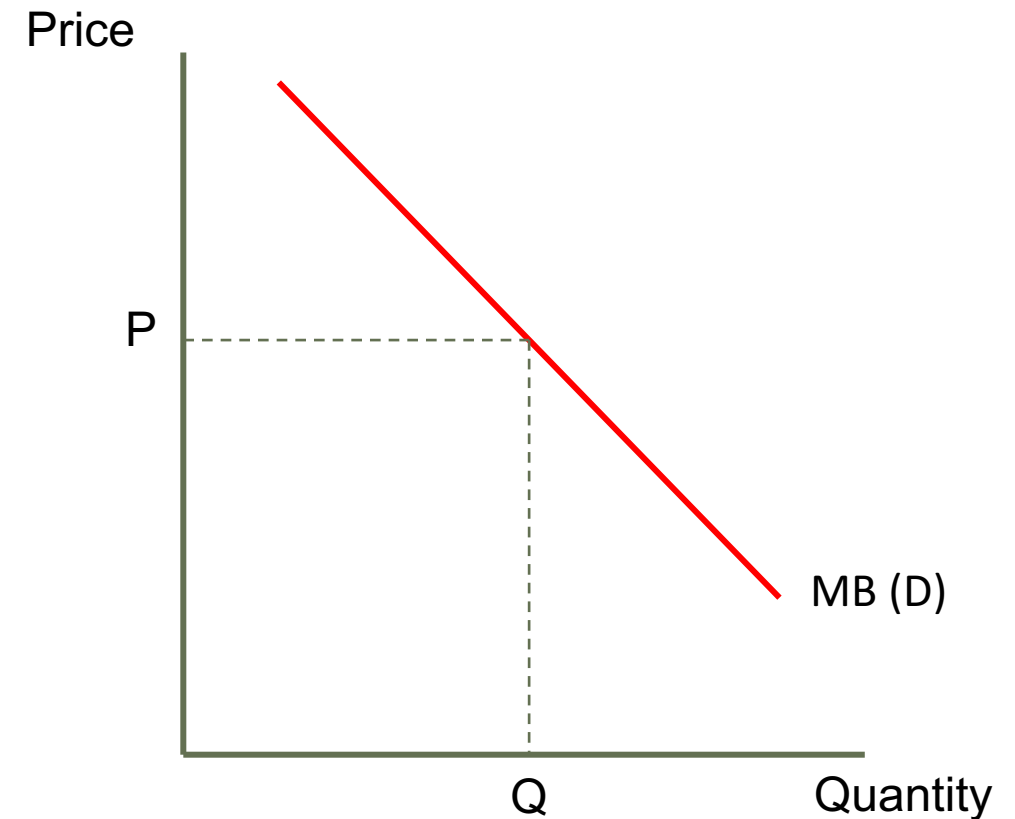


Marginal Benefit

Marginal Benefit (MB) is how much utility a person gains from consuming the next unit of the good.

The utility you gain from consuming a good gradually decreases when you have more and more of it. This is why you are willing to pay high prices to obtain the good when quantity is low, vice versa.

Hence, the marginal benefit curve is analogous to the demand curve such that more is demanded when the price is low.

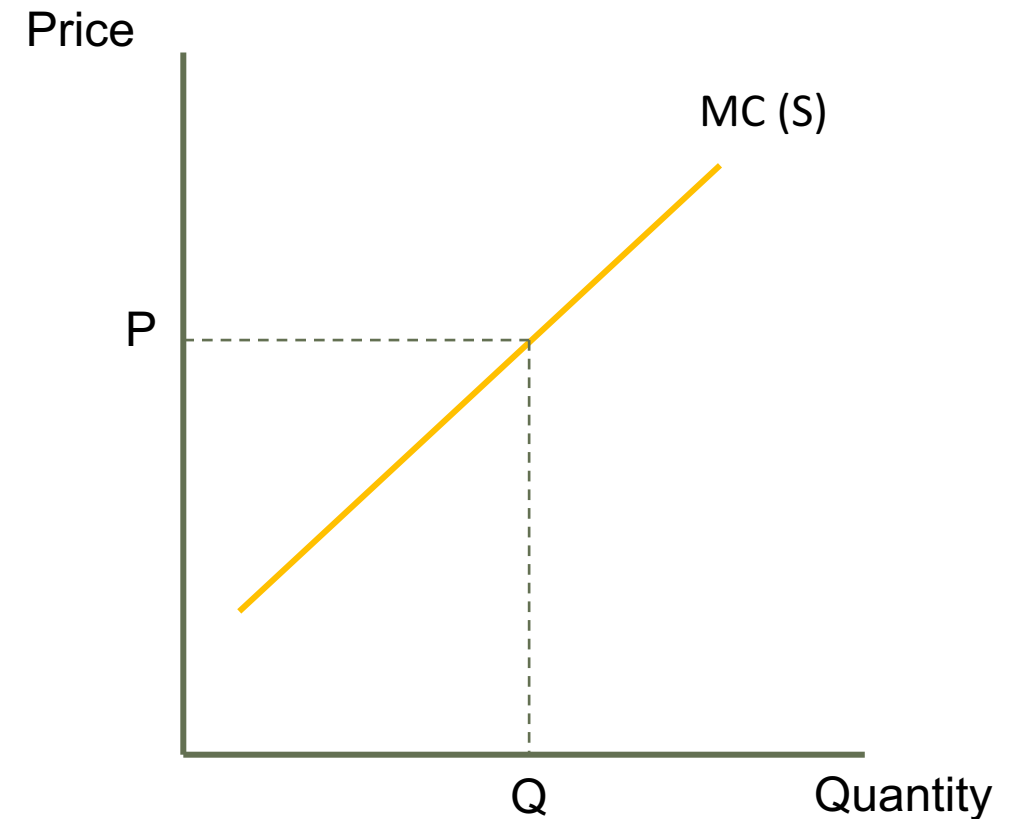


Marginal Cost

Marginal Cost (MC) is how much it costs a producer to supply one more unit of the product.

In general, if the market price can cover the cost of producing the next unit, then the firm (or society) will supply it. The market price for the next unit will be higher when more needs to be produced.

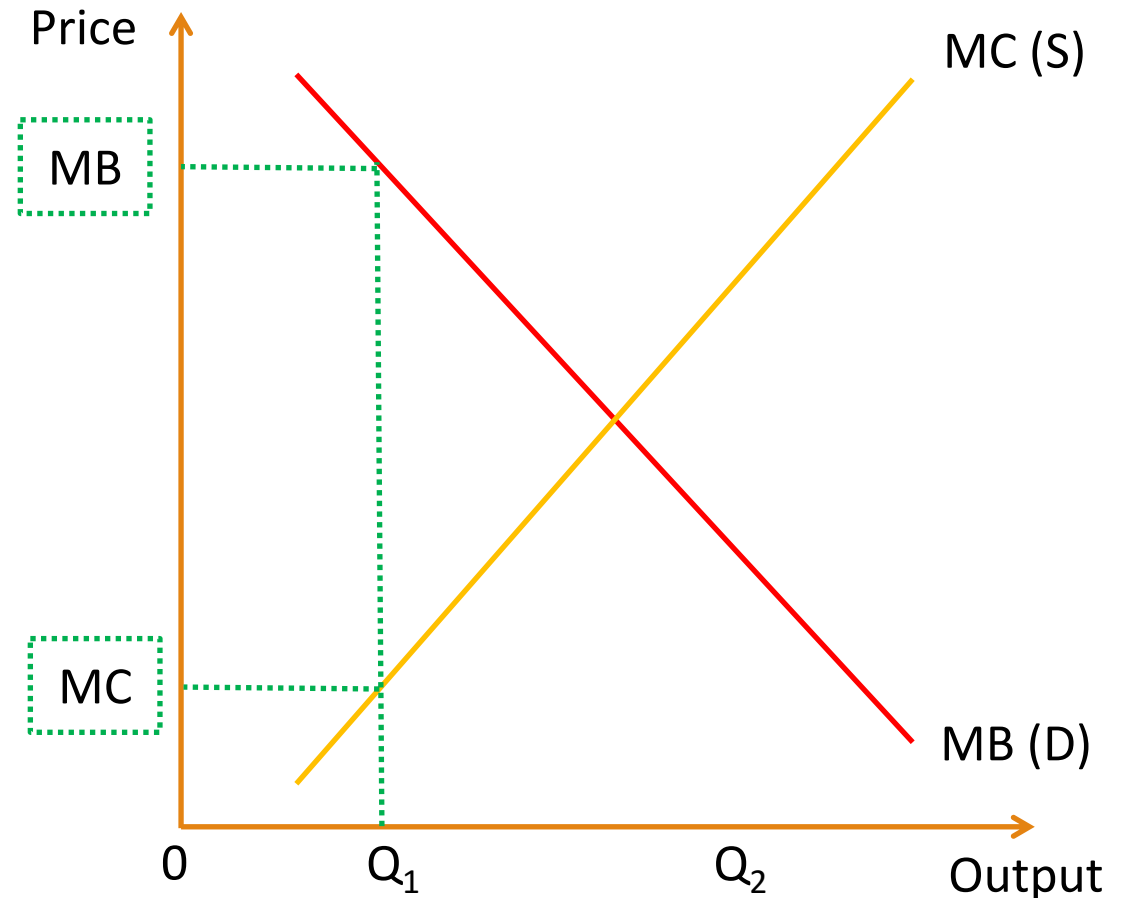
Hence, the marginal cost curve is analogous to the supply curve, such that more is supplied when the price is high.



Maximizing Net Benefit

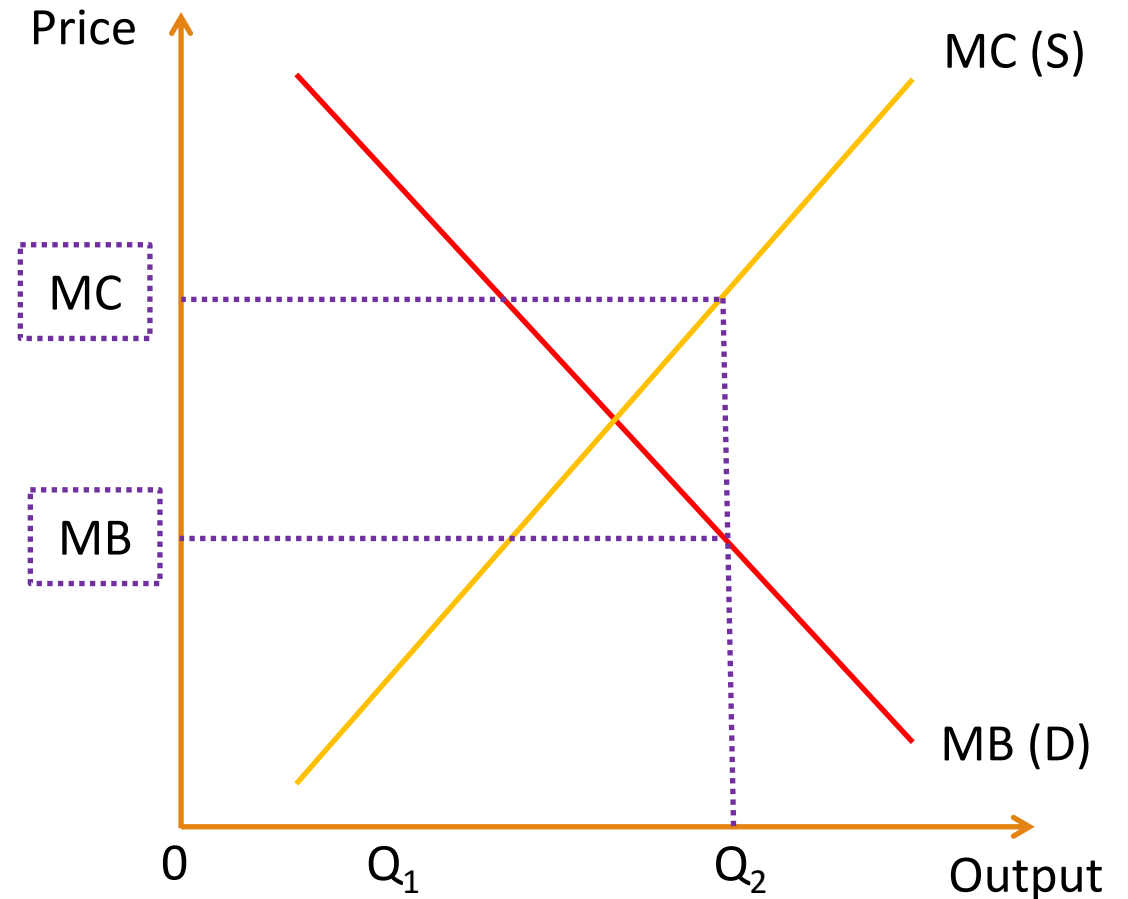
The net benefit from producing one more unit of the good is then simply $MB - MC$.

When market quantity is at Q_1 , marginal benefit is higher than marginal cost. This means consuming/producing the next unit will increase total benefit of society (because $\text{benefits} > \text{cost}$). Hence, net benefit is not maximised.



Maximizing Net Benefit

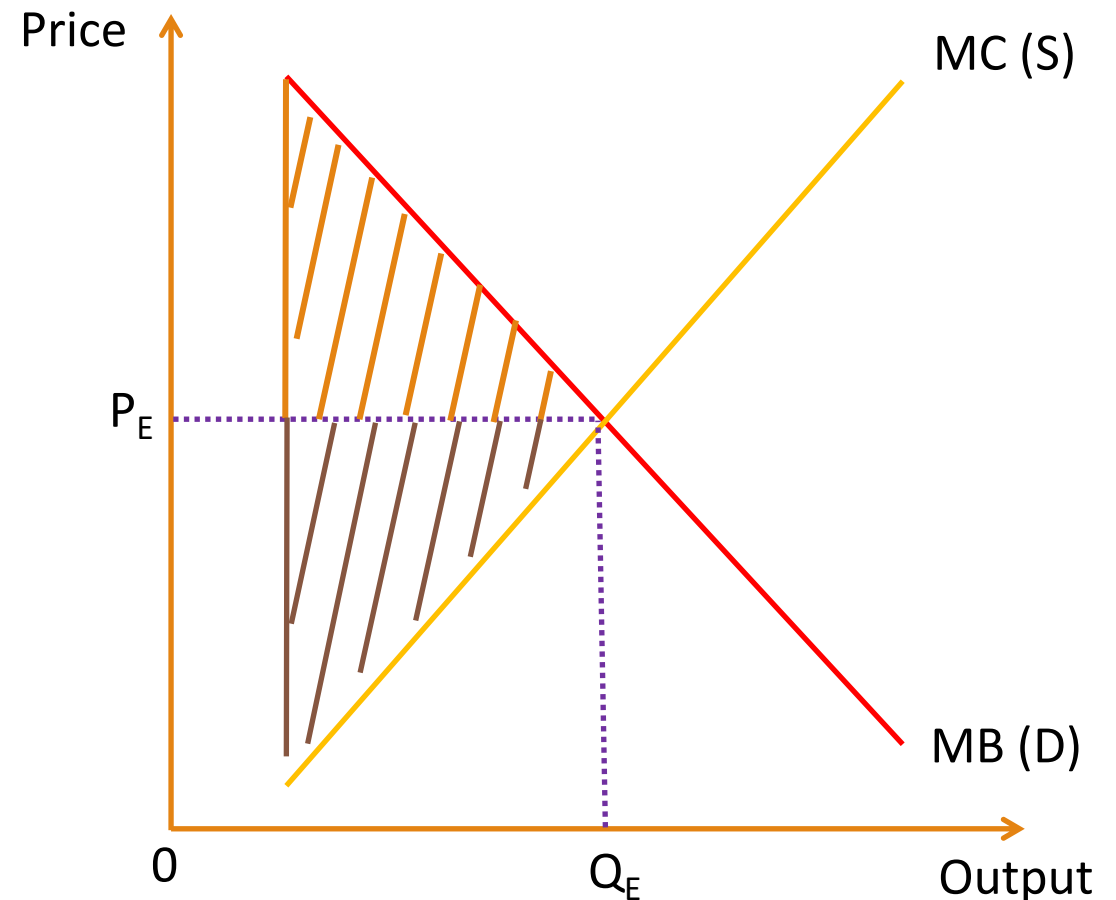
Similarly, when quantity is at Q_2 , marginal cost is higher than marginal benefit, meaning less should be consumed/produced to reduce loss of total benefit, to maximise net benefit.



Maximizing Net Benefit

As a result, net benefit is maximised at the market equilibrium where $MB=MC$. It is analogous to where demand = supply in the free market, which is also the allocative efficient point that maximises producer and consumer surplus.

When the market is not operating at equilibrium, this phenomenon is called **Market Failure**.



Externalities

In many cases, a firm's private marginal cost may not always be aligned with society's marginal cost. What do you think are some instances of this?



Externalities

We call the these examples a **Negative Production Externality** as over-production of the product leads to a negative effect on third parties (e.g. society/others).

Here are the other types of externalities:

Positive Consumption Externality is when a good/service is under-consumed because its consumption will benefit third parties.

Negative Consumption Externality is when a good/service is over-consumed because its consumption will harm third parties.

Positive Production Externality is when a good/service is under-produced because its production will benefit third parties.

Externalities

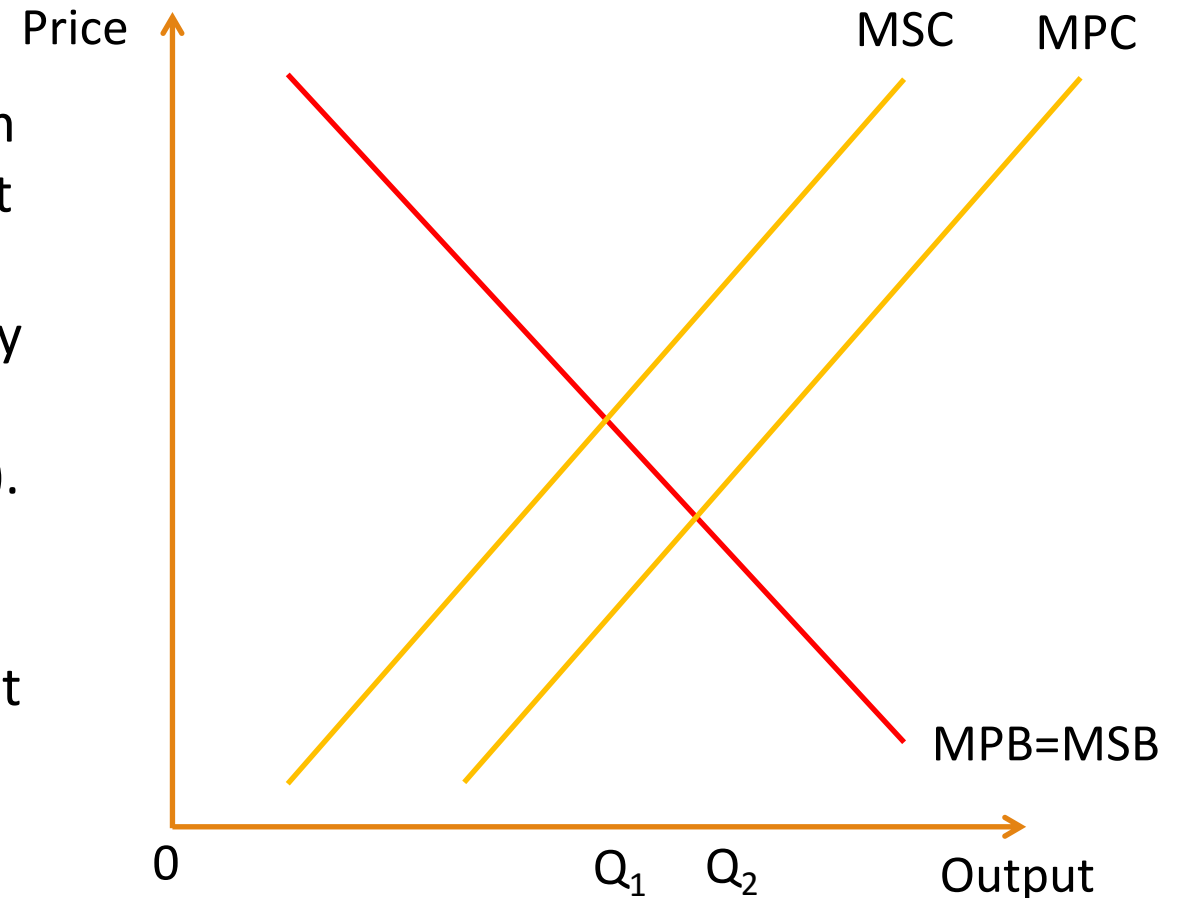
Some other examples of negative production externalities...



Externalities

In a negative production externality, the firm incurs lower cost than society as they do not need to pay for external costs (e.g. environmental pollution). This is indicated by having MPC on the right of MSC (remember supply shifts to the right when cost is lower).

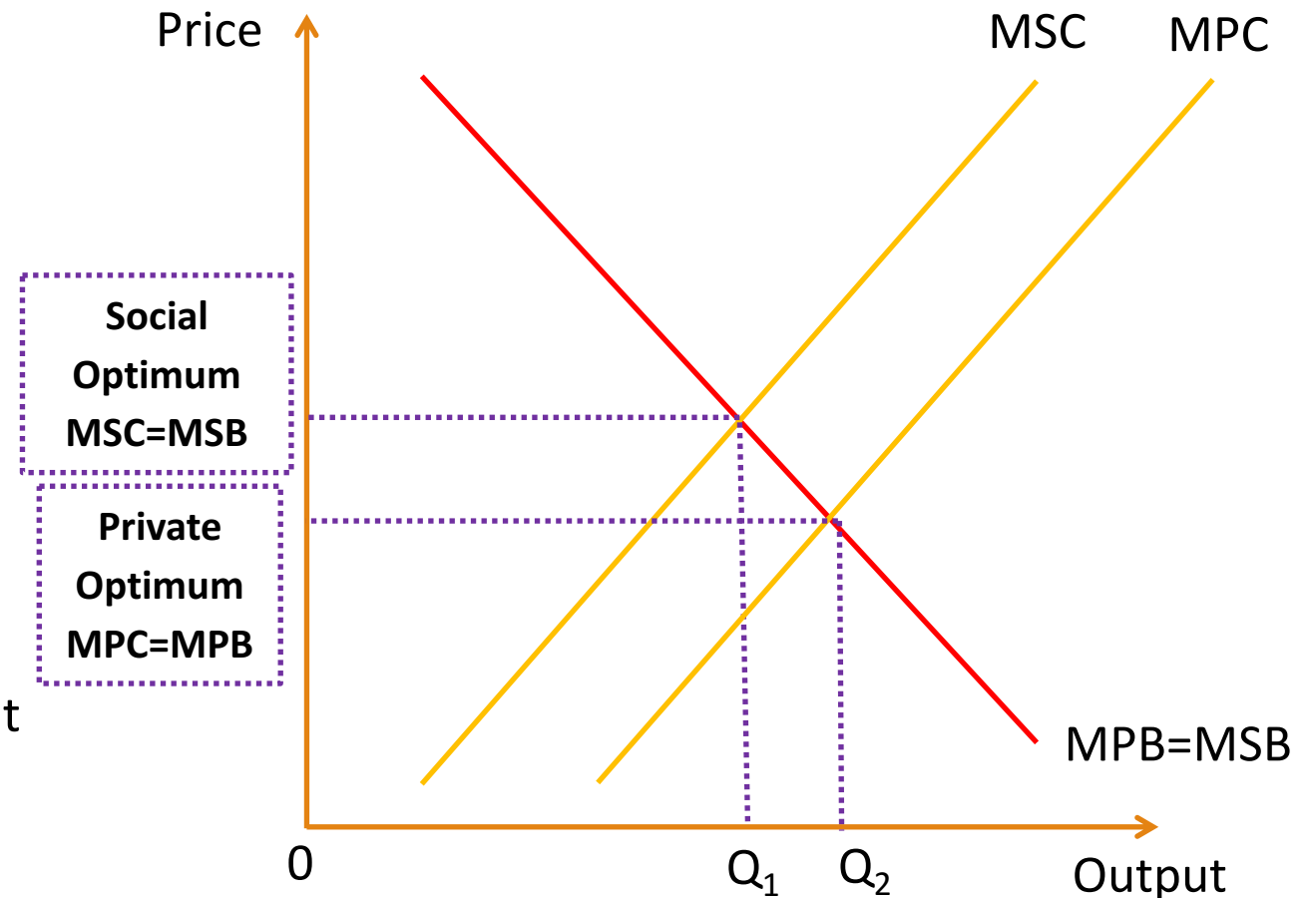
Benefits (demand) is not affected and will still be aligned, hence marginal social benefit (MSB) = marginal private benefit (MPB).



Externalities

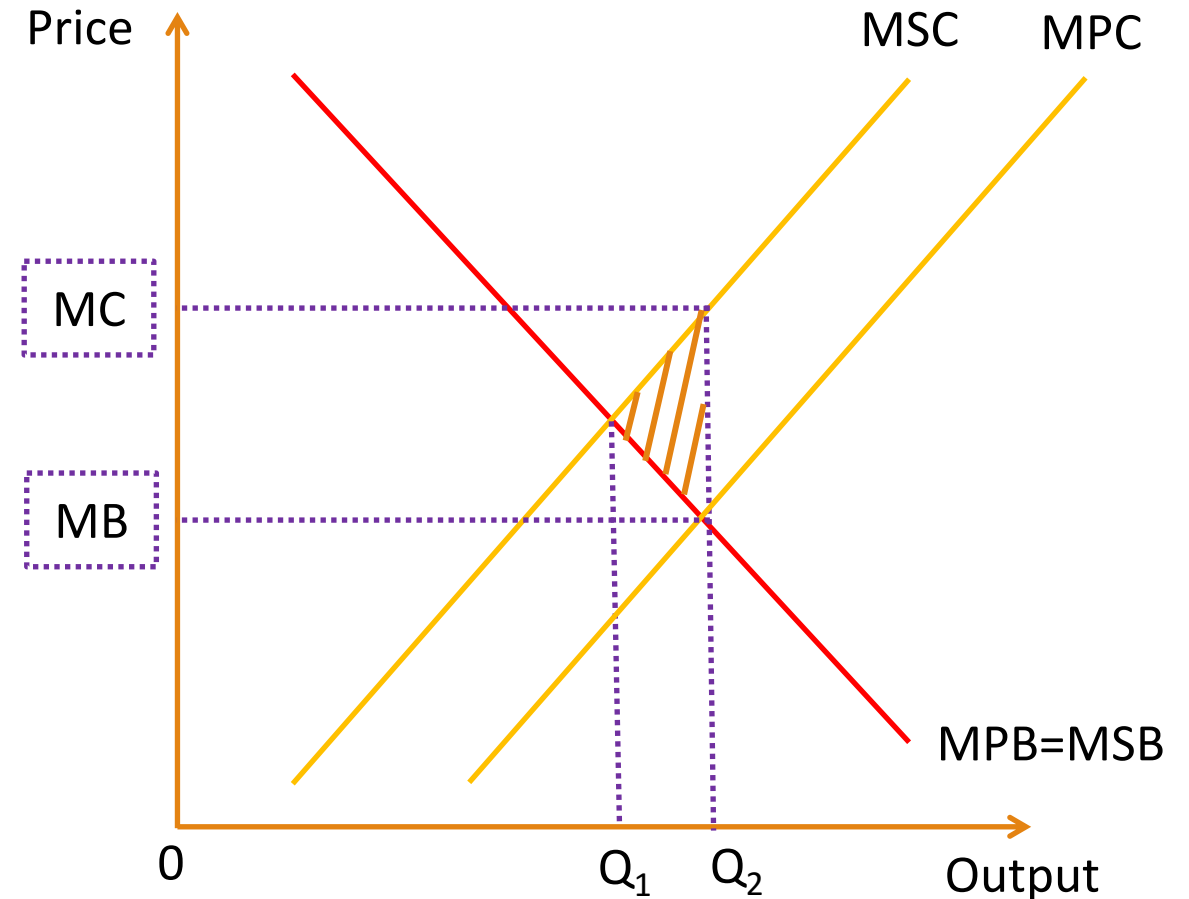
To optimise their total benefit, the firm will produce the quantity indicated at the private optimum where $MPC=MPB$ (Q_2). This is higher than the desired amount of output for society at Q_1 , where $MSC=MSB$.

Hence, the total benefit for society is not maximised as MSC is higher than MSB at Q_2 . In the oil spill example, this is because the firm does not need to pay for the negative consequences dealt to third parties when extracting (producing) oil.



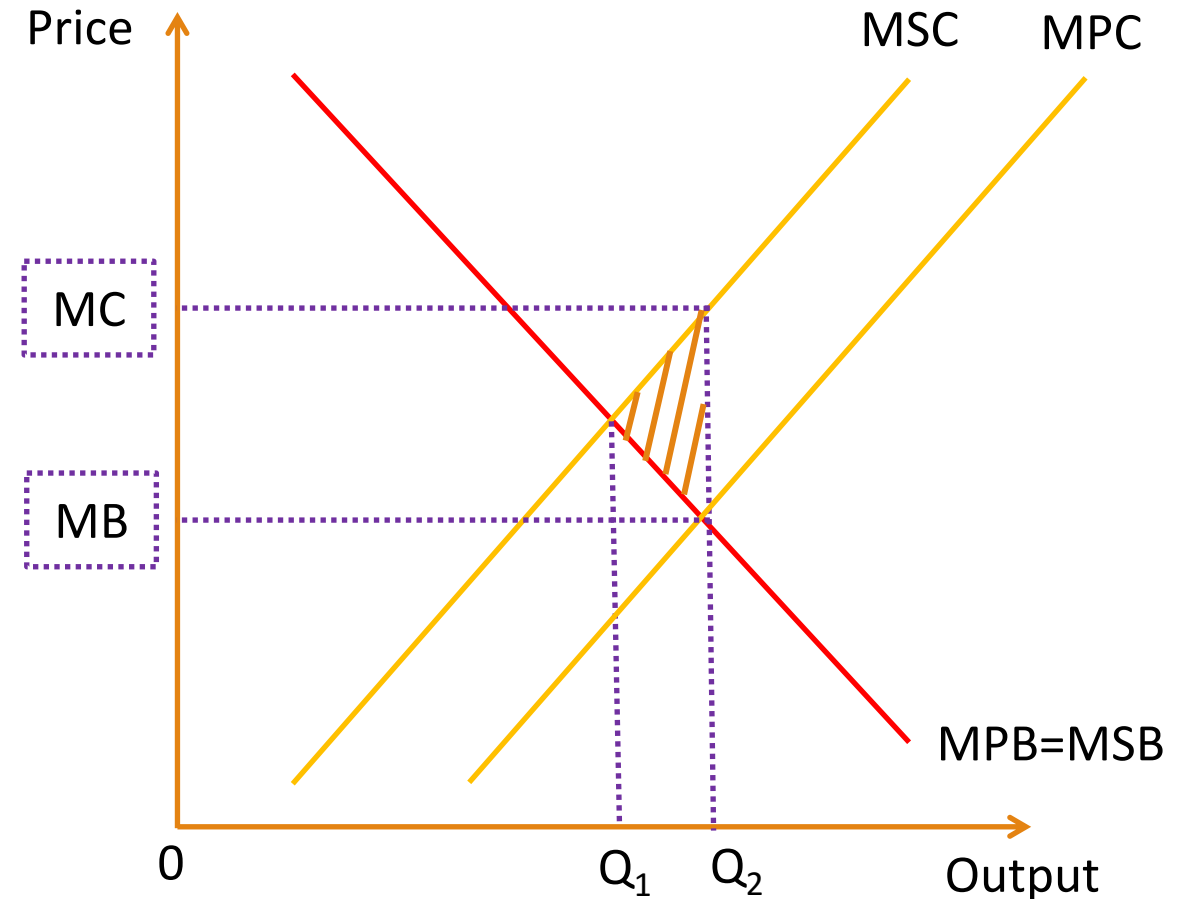
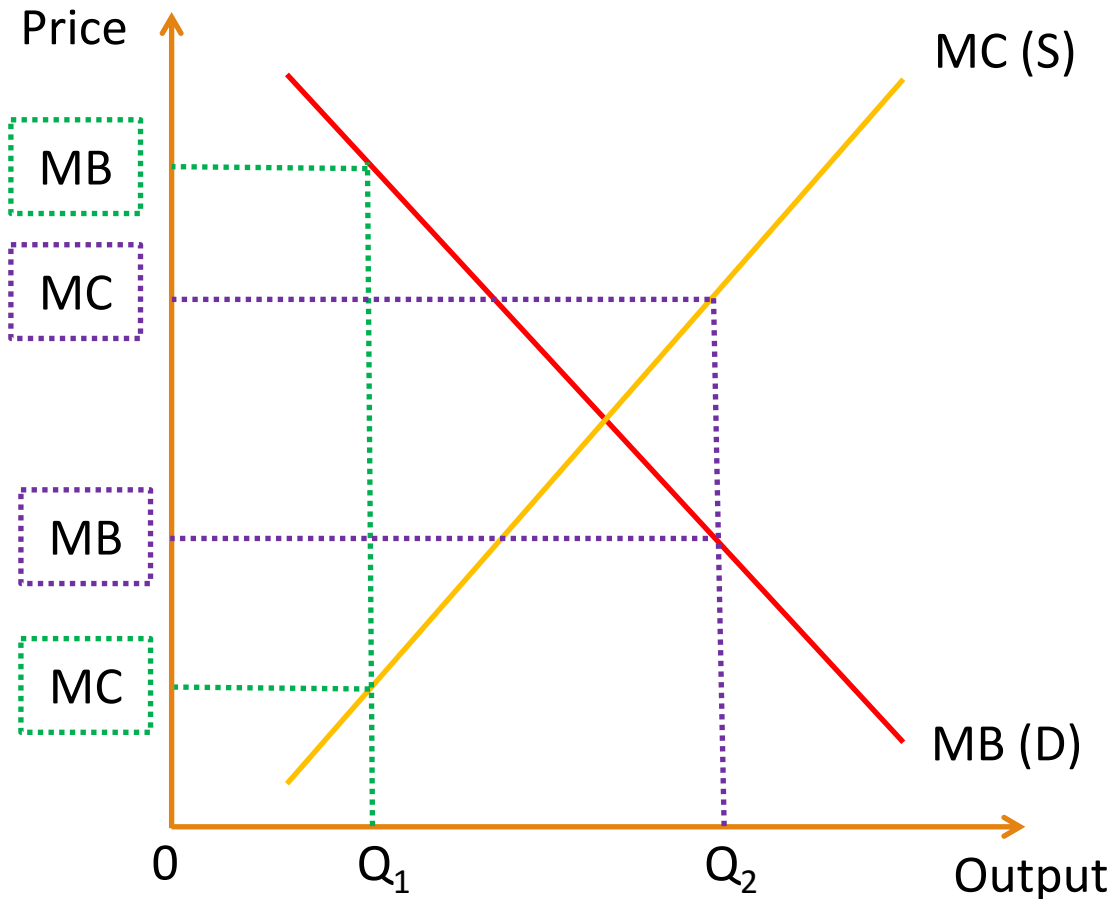
Externalities

As a result, there is a social welfare loss indicated by the shaded area, due to the over-production of oil in the society's perspective. Less oil should be produced as the social cost of producing one unit is currently higher than the social benefit received, meaning it is not allocative efficient.



Externalities

As shown below, when $MSC > MPC$, we are producing at Q_2 , but not at the allocative efficient output (equilibrium quantity). The shaded area is the social benefit lost.



Negative Consumption Externalities

Sometimes it is households which consume particular goods, that causes a negative external effect on others. What do you think are some cases of these?



Negative Consumption Externalities

Cigarette smoking often lead to detrimental health effects on the consumer. This tends to increasing costs incurred by the NHS and hence taxpayers, which is a third party.

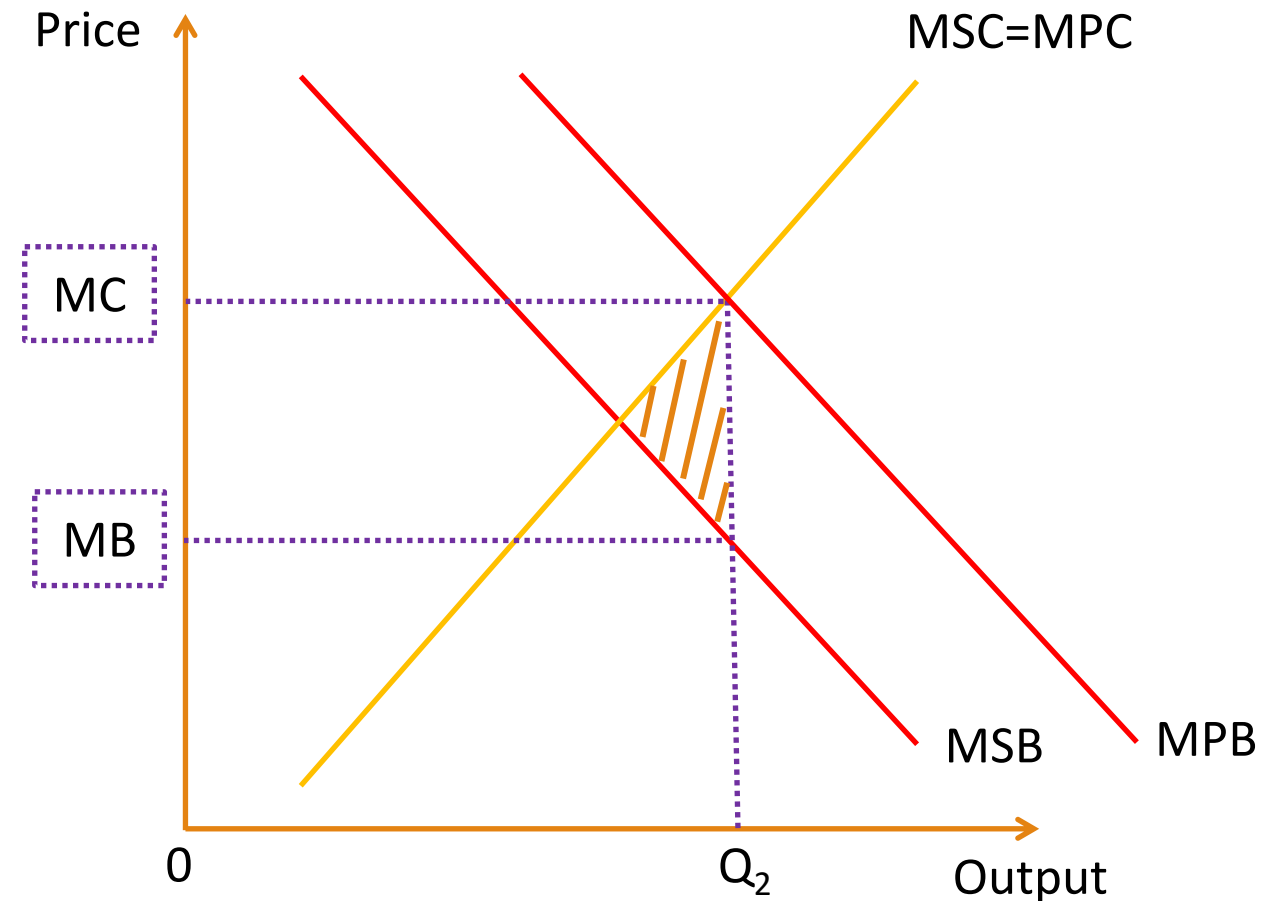
In the cigarette example, there is an overconsumption of cigarettes as the individual derives a higher benefit from smoking than society since they do not need to pay for their healthcare costs. Hence, private benefits of consumption (MPB) is higher than social benefits (MSB) for cigarettes.



Negative Consumption Externalities

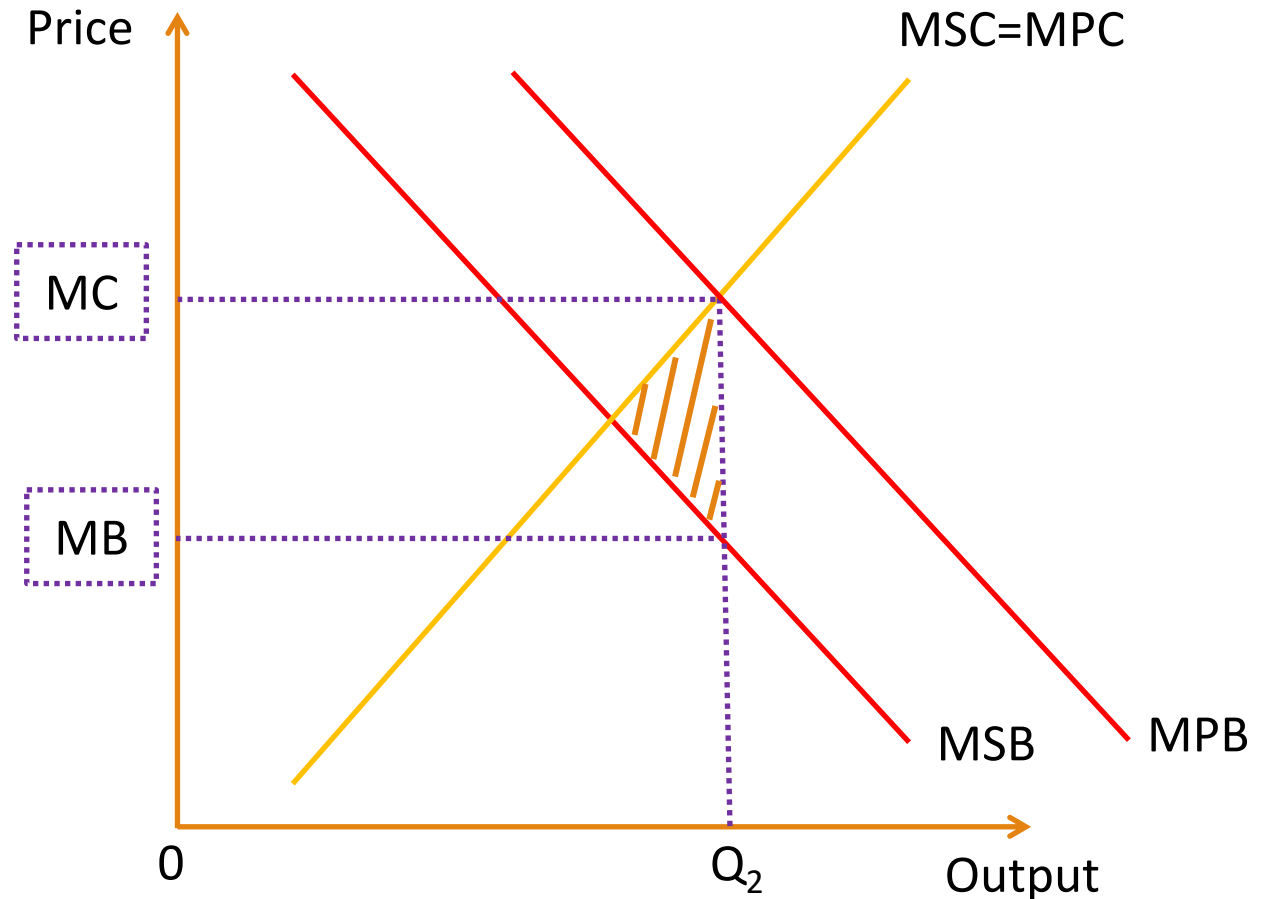
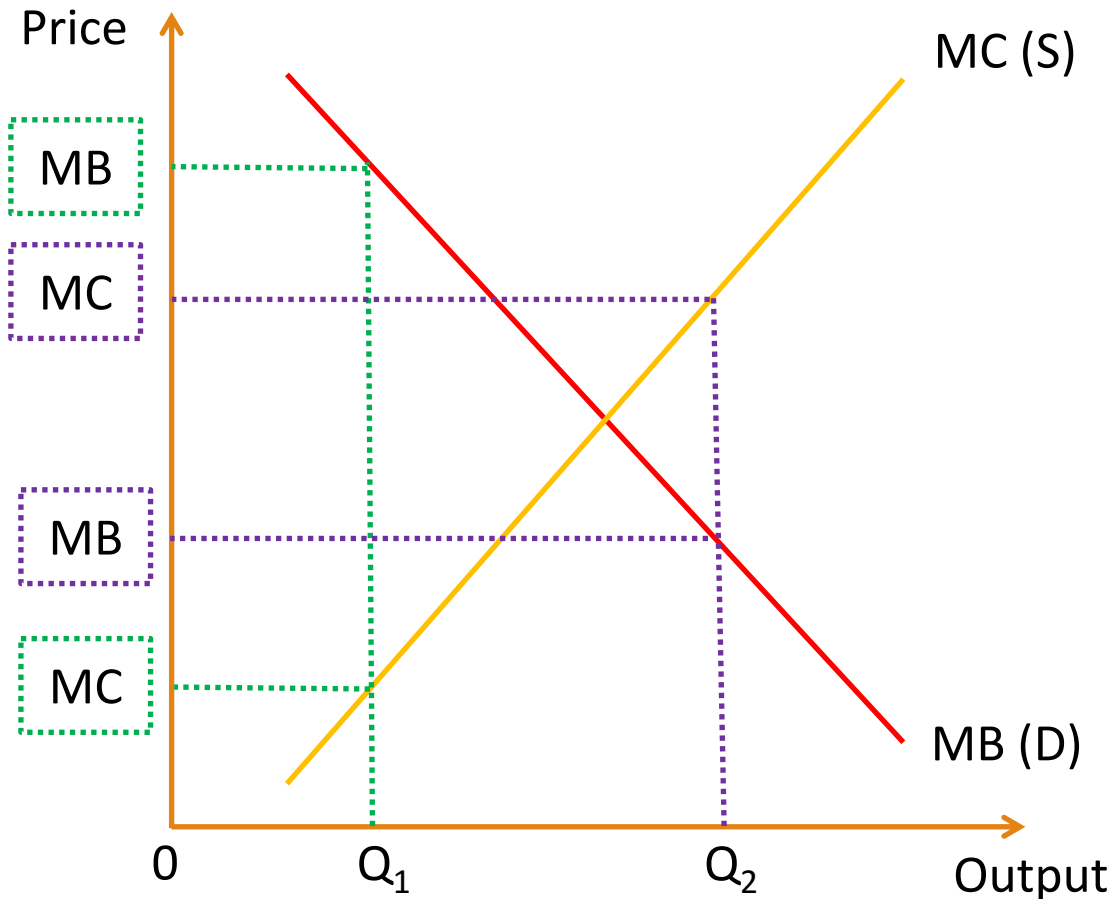
Costs are not affected and will still be aligned, hence marginal social cost (MSC) = marginal private cost (MPC).

Finally, there is a social welfare loss indicated by the shaded area, as the market is over-allocating the amount of cigarettes in the market. The quantity being transacted (Q_2) is higher than the market equilibrium quantity. This means it is not allocative efficient.



Externalities

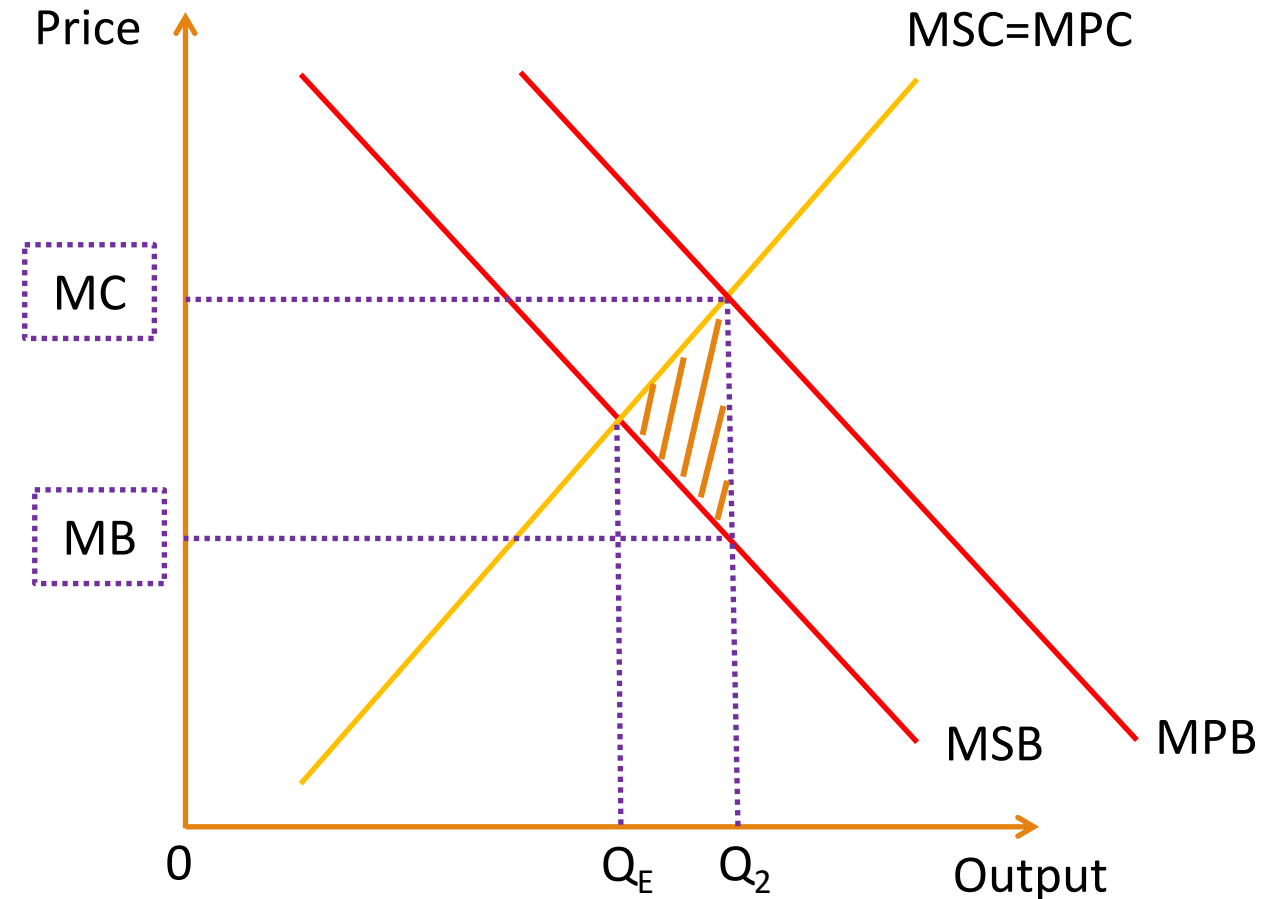
As shown below, when $MPB > MSB$, we are producing at Q_2 , but not at the allocative efficient output (equilibrium quantity). The shaded area is the social benefit lost.



Externalities

As shown in the diagram, the market is allocating quantity of cigarettes at Q_2 , but not Q_E . This means it is not allocative efficient and caused the shaded welfare loss.

If it were allocative efficient, marginal social cost would equal marginal social benefit ($MSC=MSB$) with quantity at Q_E . This point is called the **social optimum**.



Positive Consumption Externalities

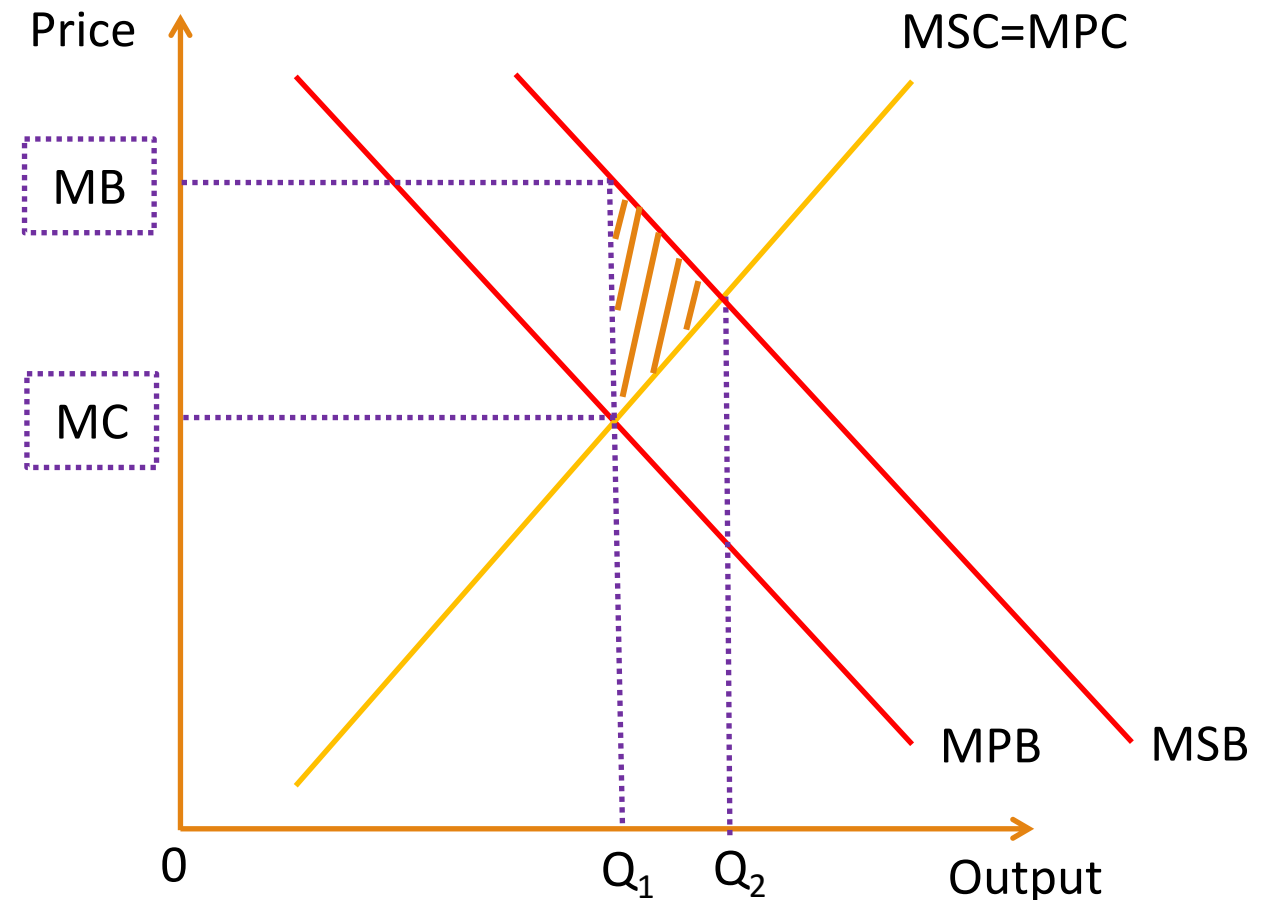
What do you think are some examples of positive consumption externalities? What goods generate a positive effect on third parties when consumed?



Positive Consumption Externalities

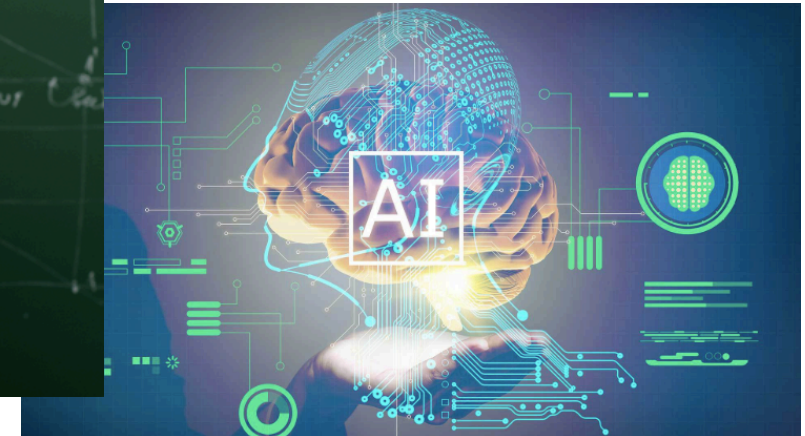
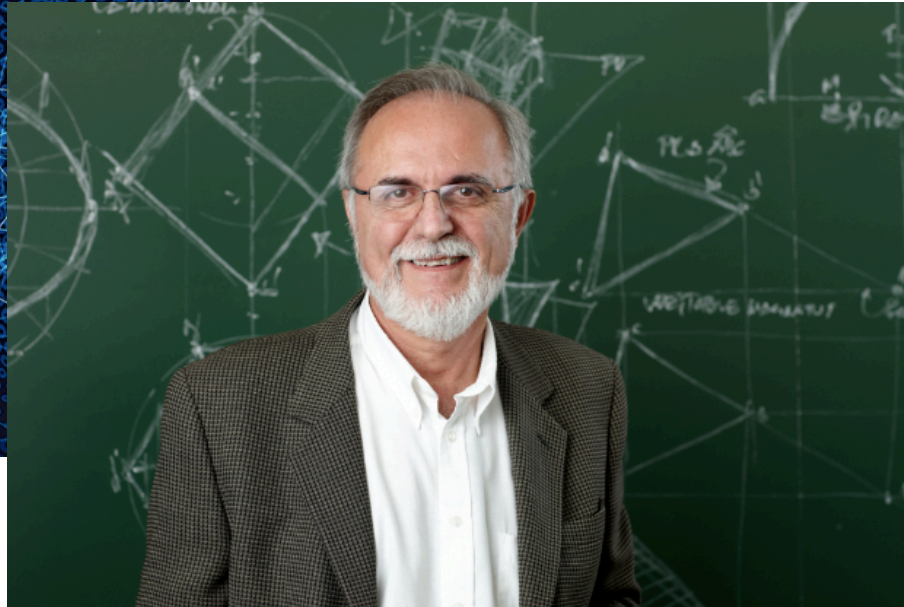
In a positive consumption externality, consumption of the good will bring about positive effects on third parties. This means to maximise society's benefit, we need to consume the good more.

Currently, the good is being under-allocated and under-consumed in the market. The shaded area is the potential welfare gain if consumption increases from the original quantity (Q_1) to the social optimum (Q_2).



Positive Production Externalities

What do you think are some examples of positive production externalities? What goods generate a positive effect on third parties when produced?



Positive Production Externalities

Try explaining the diagram of a positive production externality yourself, given previous examples of externalities.

