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## 2. 4. Market failures and the rationale for public intervention (Stiglitz ch.4, 7, 8; Gruber ch.5,6,7, Rosen 5,6)

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- ❑ Efficiency rationale for public intervention
  - ❑ Natural monopolies
  - ❑ Public goods
  - ❑ Externalities
  - ❑ Incomplete markets
  - ❑ Information failures

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## 2.4 Market failures: the efficiency rationale for government intervention

- According to the first and the second theorems of welfare economics, public intervention may be justified when there are **market failures**, i.e when the markets are not able to reach a **Pareto efficiency** (1 theorem) by themselves and/or when there is the need to redistribute resources.
  - With perfect competition:  
 **$PMC = SMC = P$**   
 **$PMB = SMB = P$**   
 **$SMC = SMB = P$**
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# Conditions for perfect competition

- Perfect competition in all markets is possible only if:
    - economic agents are so numerous and so small that they **are not able to affect prices and wages**
    - there is **perfect information**
    - there are **no limits to factor mobility** and there is freedom to enter and exit in the market
    - there are **no externalities and public goods**
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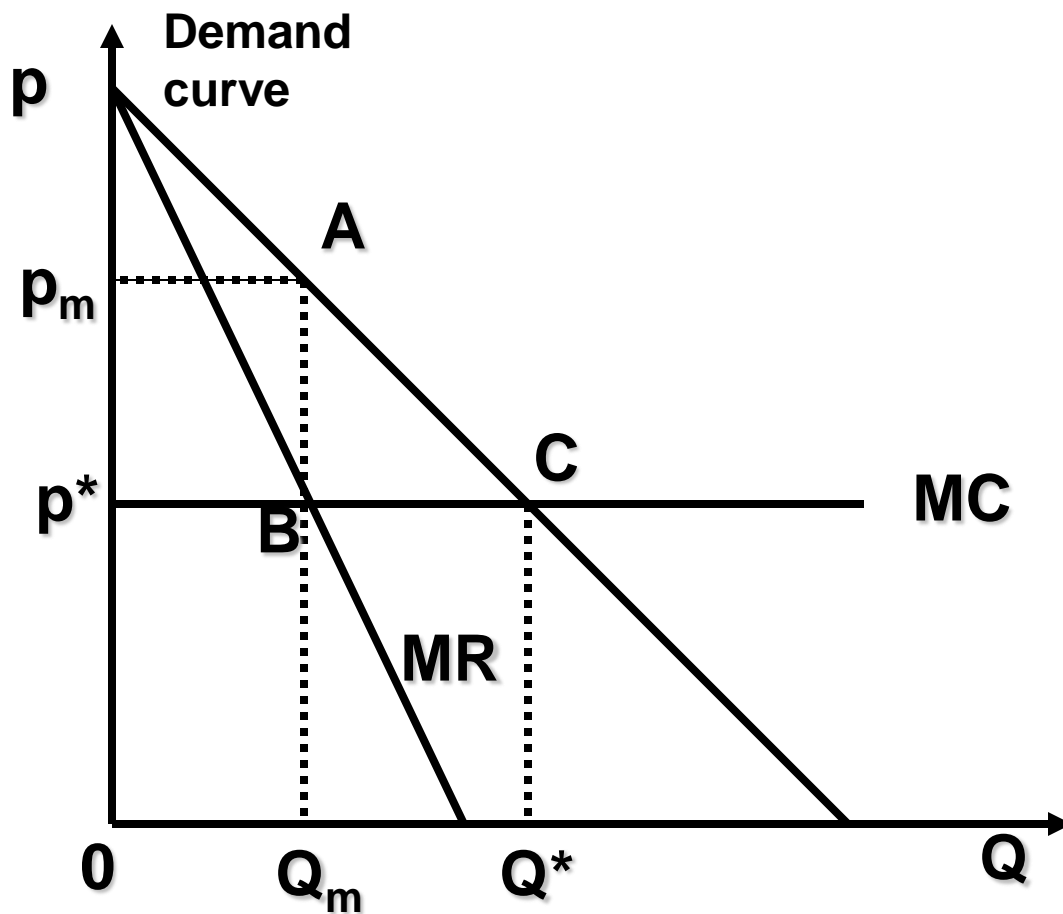
# Market failures: the efficiency rationale for government intervention/2

- Public intervention may be necessary to improve efficiency when:
  - **Economic agents may affect prices**
  - **There are externalities**
  - **There are public goods**
  - **There is not complete and perfect information**
- Even if the market is perfectly competitive there may be two further grounds for intervention:
  - Individuals may not be able to make good judgments concerning the goods to consume (**merit goods**)
  - The distribution of income deriving from perfectly competitive markets is socially undesirable (**equity considerations**)

# Market failures /1: Lack of competition

- When product **markets are not competitive**, firms control prices and try to maintain their economic rents by keeping prices higher than marginal costs and output/employment lower than in perfect competition.
- Lack of competition may be due to: high economies of scale (natural monopoly); restrictive trade practices by large firm(s) (monopolistic or oligopolistic firms) which impose barriers to entry; high fixed costs (non contendible markets) or imperfect information that creates barriers to entry and exit.
- In this cases **competition policies**, such as **antitrust, and regulation**, may be adopted by governments. Examples:
  - The Microsoft court case at the EU level,
  - The EU Bolkestein directive for competition in the service sector.

# Imperfect competition/ monopoly



$P^*$  and  $Q^*$  represent the competitive equilibrium prices and output ( $P^*=MC$ );

$P_m$  and  $Q_m$  represent the non competitive equilibrium ( $MR=MC$ ).

# Lack of competition: Natural monopolies (Stiglitz ch.8.1, Rosen ch.5)

- In some *network industries* (ex. *railways, electricity generation and distribution, water distribution, telecommunication*) there are **high economies of scale** and average production costs falls as production increases, due to the high fixed costs associated to the production of the good.
- In these cases, the only **economically feasible (efficient) way to produce goods/services is to have a monopolist**: it is cheaper to have a single firm to produce the entire output, than several firms producing part of it.
- For example in water distribution, the major production cost is the network of pipes. Once pipes have been installed, the additional costs of supplying water to an extra user are relatively insignificant, hence it would be inefficient to have two networks of pipes. In this case competition is not feasible. So the market would produce a monopolistic firm, with the inefficiencies associated to it.

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# Natural monopolies: possible interventions

- To reduce monopolistic pricing, the government could intervene by:
    - **Granting monopoly rights to a public company** in exchange for a regulation preventing monopolistic pricing. Public companies however may be inefficient, due to the absence of competition.
    - **Contracting out the production** to private providers, but regulation and controls are costly
    - **Focusing government involvement only on the natural monopoly business and encourage competition where feasible** (for example by separating electricity generation, which may be produced by several producers, from electricity distribution, which is a natural monopoly) as in UK and Italy.
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# Public goods (Stiglitz ch.6, Gruber ch.7, Rosen ch. 5)/1

- Some goods or services, such as *clean air, information, street lighting, parks, national defence, justice*, are **pure public goods**, because they are:
    - **non –rival in consumption** (one individual's consumption does not reduce their availability for others) **and**
    - **non excludable** (it is not possible to exclude someone from their benefits): It is not possible to prevent people consuming them and they are non rejectable, because the costs of producing one unit is equal to the costs of producing more units, a potentially infinite number of users can benefit simultaneously.
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## Public goods/2

- The main difference between public and private goods is that:
    - With **public goods**: everyone consumes the same quantity, but values them differently (different MRS across individuals).
    - With **private goods**: everyone has the same MRS but can consume different quantities
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## Public goods/3

- Since it is not possible to make profits out of public goods, the market would not provide these goods/services or will provide too little of them. *If a public good is to be produced, the only way is to make payment compulsory via taxation.*
- ***Impure public goods*** are those goods/services that are excludable (without increasing costs too much), but still non rival (ex. highways, education), or vice-versa rival, but non excludable (as parks when congested). In these cases it is possible to introduce **user fees**, to cover at least part of the costs

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# Public goods: possible intervention

- **These goods /services are not necessarily produced by the public sector.** Their production may be contracted out to private providers or non profit organizations.
  - However there are problems of **free riding** since it is not possible to exclude users who do not pay for it, users are induced to hide their preferences. *Free riding* is a rationale behaviour when consumers realize that they cannot be excluded from the use of public goods.
  - There are also difficulties in setting **user fees** in the case of impure public goods.
  - **Efficiency and equity problems:** if the user fee is set to cover production costs we reach equity (those who benefit pay for it), but reduce efficiency (we may have under-utilization).
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# Externalities (Stiglitz ch. 9, Gruber ch.5 and 6, Rosen ch. 6))

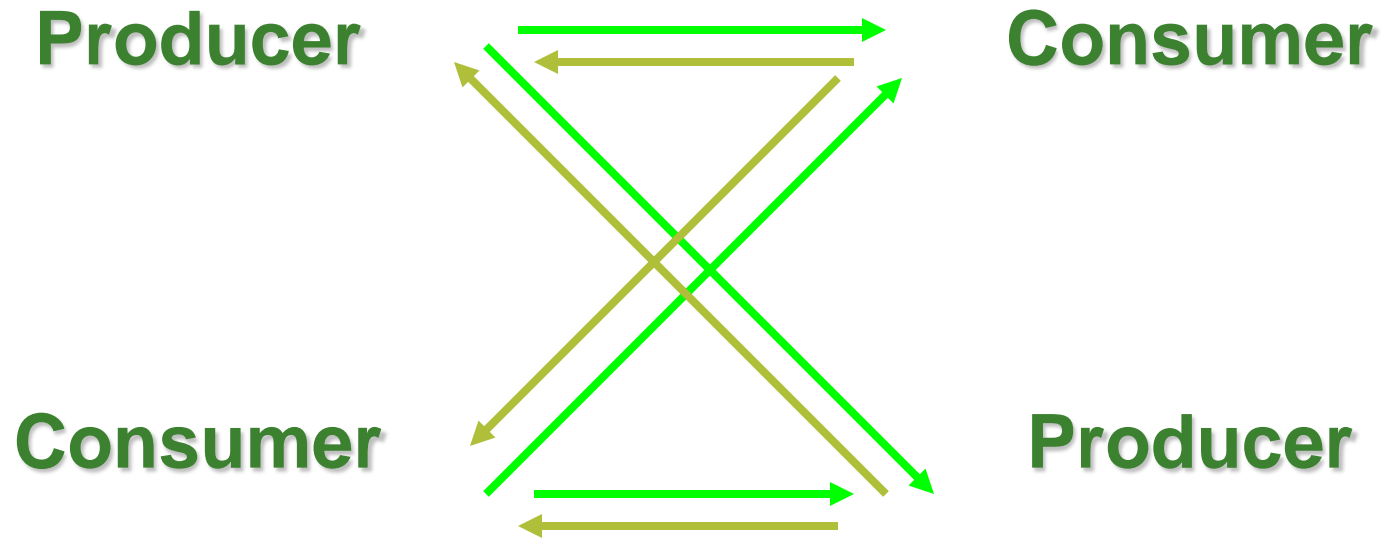
- There are **externalities** when the behaviour of some economic agent affects the well being of others and this effect is not compensated, even if there is perfect competition.
- **Negative externalities:** when **social costs are higher than individual costs**, as with *air pollution, congestion, accidents costs* coming from the private use of roads by vehicles. Individuals and/or firms do not pay for the full consequences of their actions. Since social costs are not passed into higher product prices, prices are too low relative to the marginal (private + social) costs. The market equilibrium would entail an **excessive production and consumption** of the commodity producing the negative externality (productive and allocative inefficiency). *Note that there is a socially optimum level of negative externality (such as pollution) in efficiency terms.*

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## Externalities /2

- **Positive externalities:** arise when **social benefits are higher than private ones**, as with *education, investments in R&D, health* etc.. The market equilibrium would entail an **under-production** of the commodity as economic agents are not compensated for improving the well being of others.
  - **Production externalities:** SMC differ from **PMC**; **Consumer externalities** : SMB differ from **PMB**
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# Eight types of externalities



 **Positive externalities**

 **Negative externalities**

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# Examples of negative and positive externalities

- **Negative externalities:**

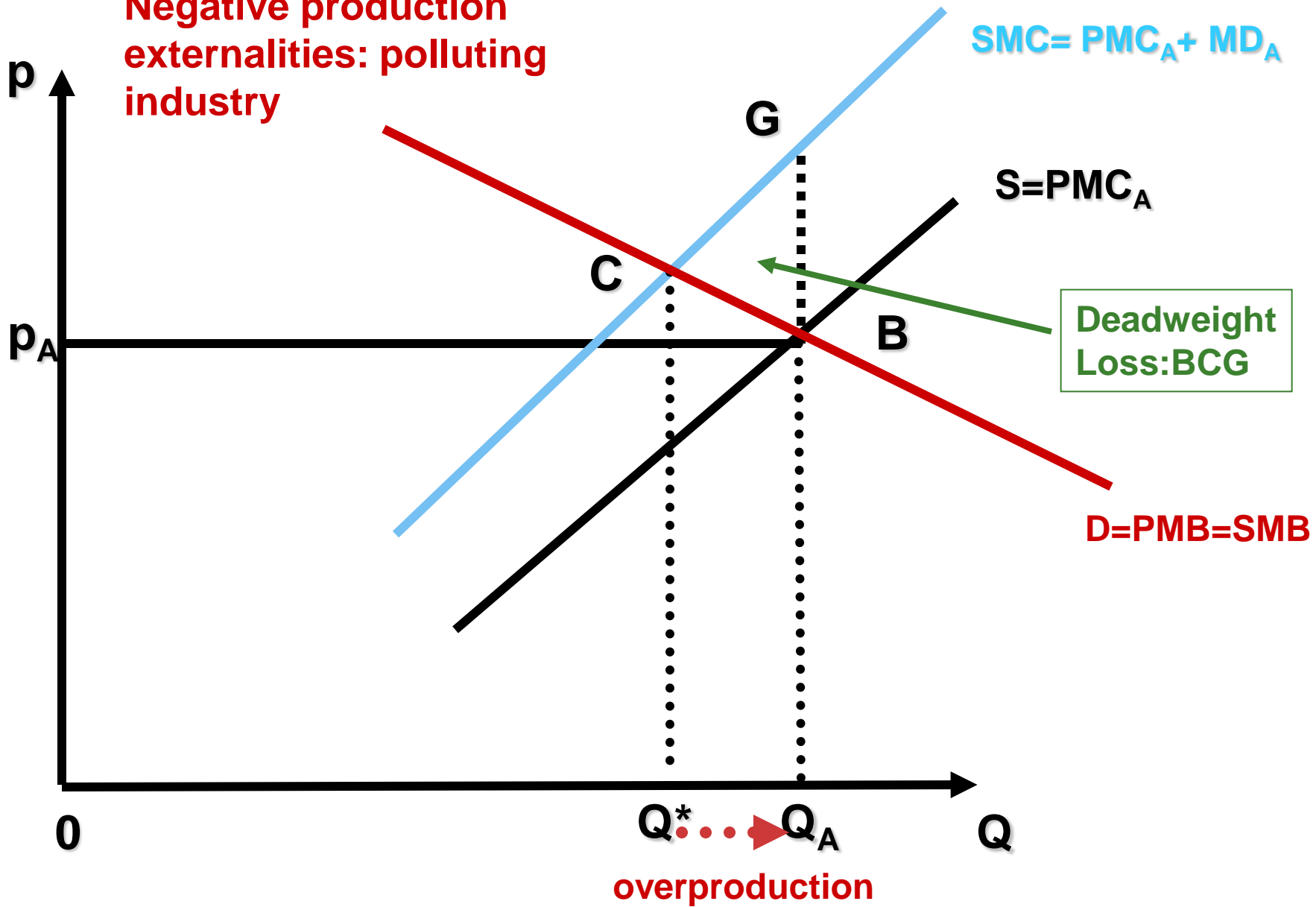
- P/C: a firm polluting a residential area
- P/P: a firm polluting a river with fishing activity
- C/P: private road traffic increases transportation times and costs for firms
- C/C : smoking

- **Positive externalities**

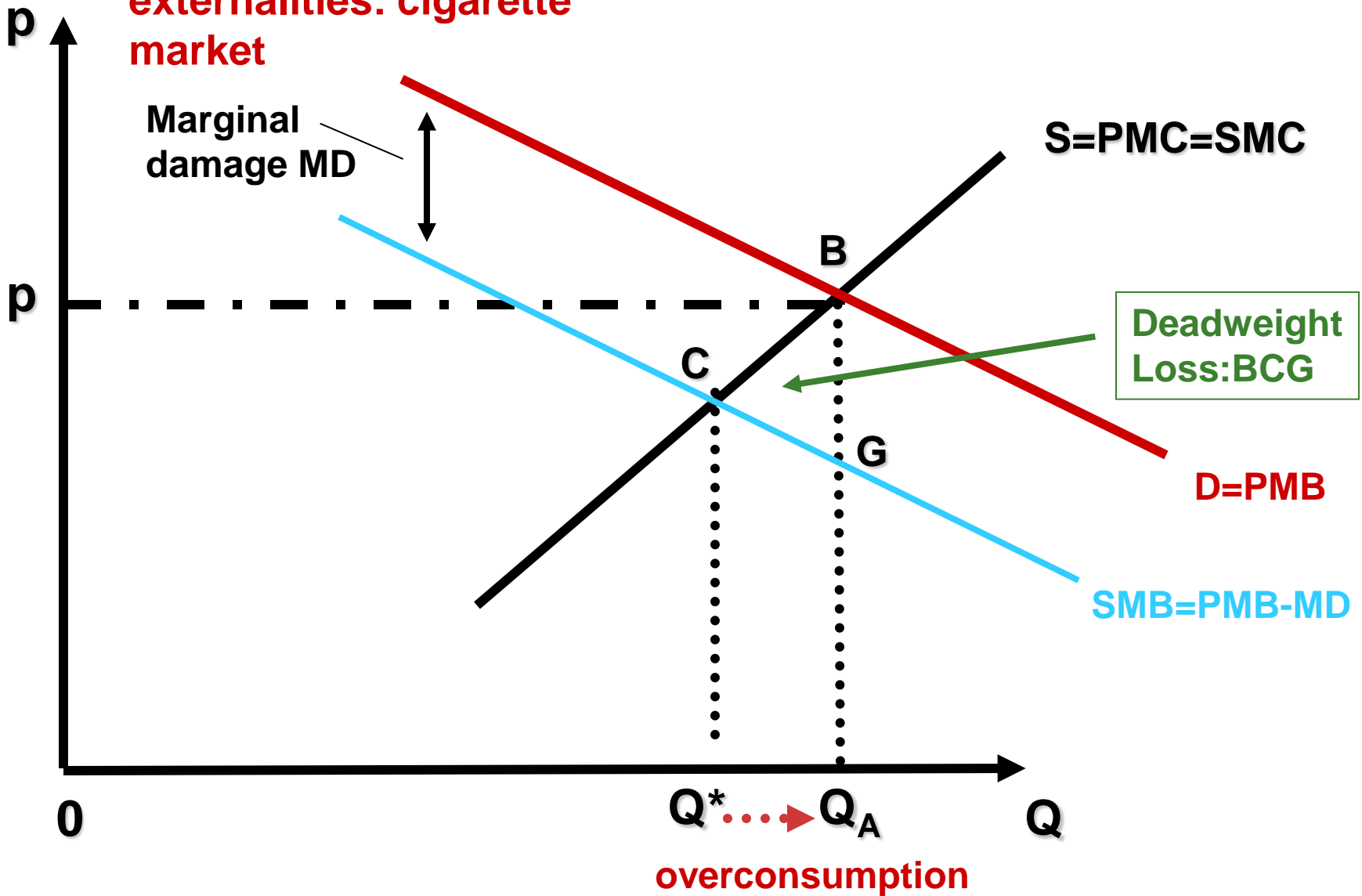
- P/P: investments in R&D
  - C/C: nice private gardens
  - C/P: investments in Human Capital
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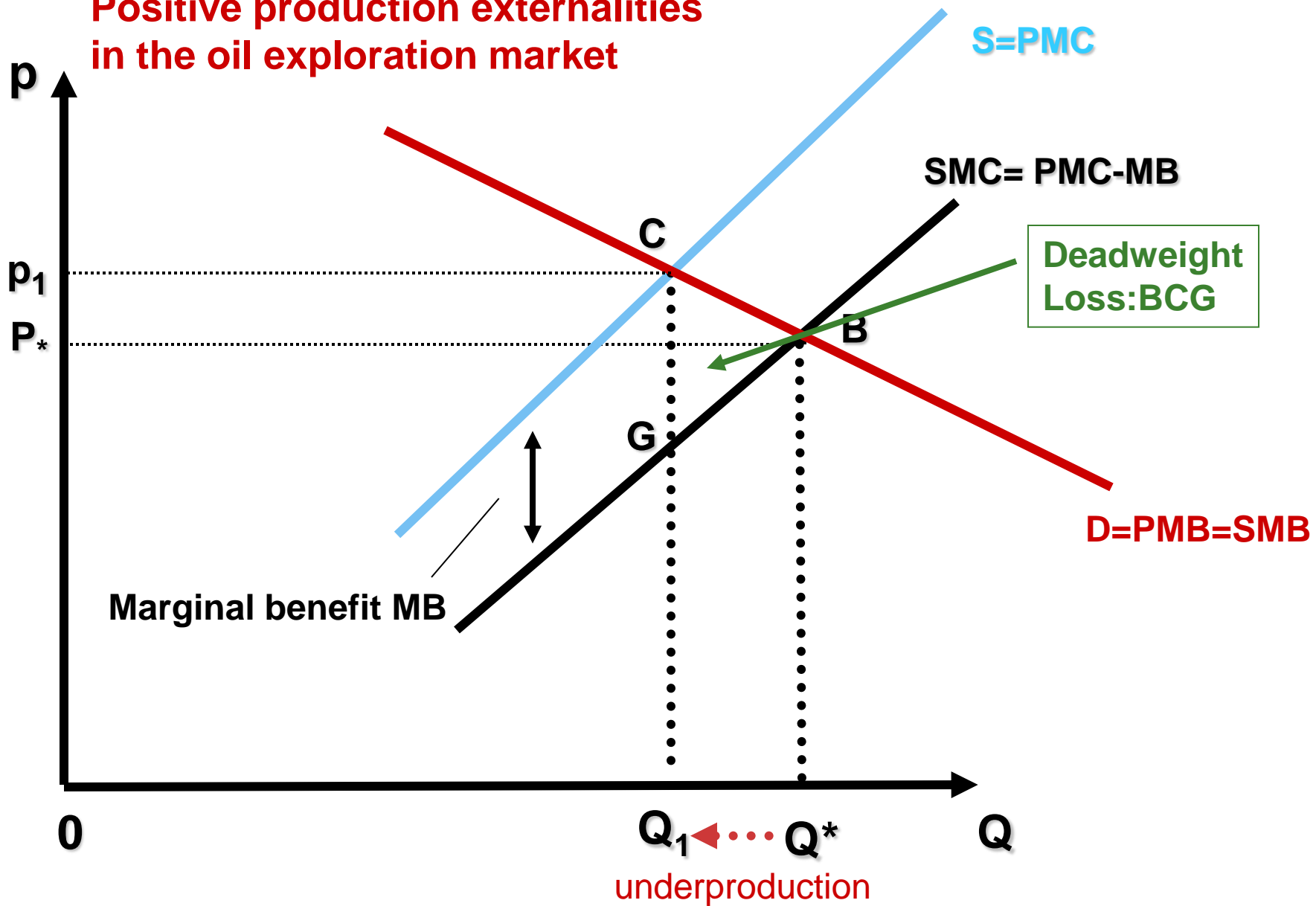
Negative production externalities: polluting industry



# Negative consumption externalities: cigarette market



# Positive production externalities in the oil exploration market



# Negative externalities: ways to deal with them

- The ways to deal with these problems are to support the **internalization of the externalities**, through:
  - **Regulation and legal system**, i.e. limiting output (but costly to monitor and enforce): it is a public solution affecting quantity. Better when we want to reduce the externality whatever the cost of reduction
  - **Attribution of property rights** to those involved (*Coase Theorem*), letting the parties involved to make arrangements for the externality to be internalized by compensations agreements
  - **Introducing marketable permits**, for example by limiting the amount of pollution each firms can emit and letting firms to trade these pollution permits. Problem: how to define initial permit assignments?
  - **Introducing abatement subsidies**, ex: subsidizing pollution abatement expenditure with a subsidy equal to the difference between the marginal social benefit of pollution abatement and the firm's marginal private benefit)
  - **Taxing** the negative externality (*Pigouvian taxation*) to equalize private and social costs. This is the most appropriate economic solution, since it minimizes the need for gvt intervention and makes the polluter pay for the social costs imposed on others.

Quantity  
private  
solution  
- Coase

Price  
public  
solution

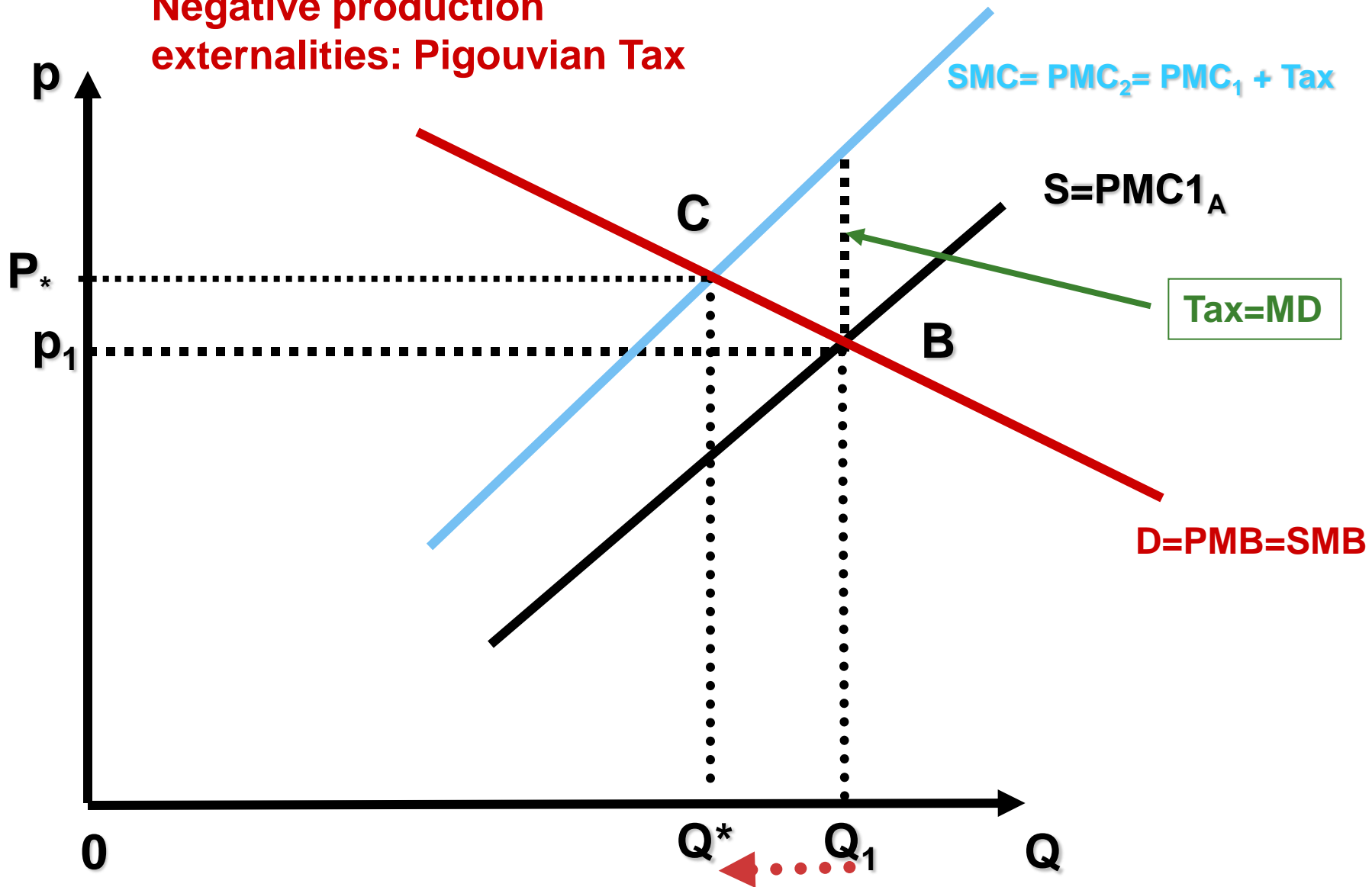
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# Negative or positive Externalities-possible solutions: Pigouvian Taxes/subsidies

**Pigouvian taxes** are corrective taxes levied on polluting firms:

- The tax is designed so as to make the marginal private costs equal to marginal social costs and marginal private benefits equal to marginal social benefits.
  - The pollution tax per unit of production is equal to the marginal cost of pollution
  - Examples of Pigouvian taxes are the Carbon Tax and the Tax Road Pricing
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# Negative production externalities: Pigouvian Tax



# Negative Externalities-possible solutions: Coase Theorem

- **When property rights are well defined and bargaining is costless, the negotiations between the party creating the externality and the party affected by it can bring the socially optimal market quantity. The efficient solution does not depend on which party is assigned the property right.**
- The government only establishes property rights, which assigns to a particular individual the right to control some assets and to receive fees for the property use.
- There is incentive for bargaining between the polluter and the other party and to reach an efficient equilibrium on the basis of compensations paid to have the right to pollute or the right to non pollution
- **Limits** of the theorem:
  - bargaining is efficient only if **the number of bargaining units is small**. Otherwise transaction costs may be high.
  - **the redistributive problem** implicit in the allocation of property rights is **undetermined**. The determination of who compensate whom (the polluter compensate society for polluting, or vice versa society compensate the polluter for non polluting) makes a great difference to the distributive implications of the externality.

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## Positive externalities: ways to deal with them

- Two options for gvt intervention when there are positive externalities and there is under-production:
    - **Compulsion:** for example in the case of compulsory education (problem: how much education should be compulsory?)
    - **Subsidies:** subsidies reduce the price paid by consumers and may increase demand up to the socially optimal level (ex. School vouchers). Need to compare the costs of public intervention with the benefit deriving from improving allocative efficiency
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# Merit goods (a form of externality)

- Pareto Efficiency assumes that individuals are the best judges of their own welfare, however **individuals may undervalue the personal benefits derived from consumption of a commodity** (i.e. they may attribute insufficient merit to the commodity, for example they may make insufficient provisions for old age or illness), and this would produce allocative inefficiency.
- The government may compel or encourage individuals to consume these goods/services for their well being using:
  - **Compulsion** (as in the case of obligation to adopt safety measures, Compulsory pensions savings, compulsory education)
  - **Improving information** (ex:information on health risks)
  - **Subsidies** to reduce the price paid by consumers (as in the case of tax relief on the purchase of private health insurance and private pensions).
  - **Taxes** to increase the price of negative goods (ex. Cigarettes or junk food)

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# Incomplete or complementary markets

- **Incomplete markets** arise when some goods/services are not provided by the market (missing markets). For example insurance and capital markets are incomplete because they do not provide for insurance for many important risks.
    - Possible reasons: *high transactions costs; asymmetries of information and enforcement costs* which produce **adverse selection and moral hazard problems**.
  - **Complementary markets** are those services/productions which require large scale coordination to be profitable and prices do not function as coordination devices (such as urban renewal programmes), in these case the government may assume the coordination function.
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# Information failures

- Often information is not complete and the buyer may not have the same information as the seller or vice versa (asymmetric information). **Adverse selection and moral hazard** may occur.
  - Unemployed workers may not know where available jobs are and employers do not know the skills of workers; sellers of insurance do not know relevant information on the buyers.
  - Information is sometime a public good, so that the market does not provide it
  - The state should intervene to support the diffusion of information and to reduce information asymmetries among buyers and sellers, by appropriate regulation. However risk of excessive regulation, which reduces competition.
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# Adverse selection and the insurance markets

- There is **adverse selection** when one of the party does not know some characteristics of the other party which are relevant for the contract to be stipulated.
  - *Insurance markets* are examples of these problems: lenders do not know the riskiness of borrowers and set interest rates in order to cover for such risks.
  - If the interests rates are too high only high risk borrowers, who are more likely not to repay the loan, will be willing to accept the loan, while low risk borrowers will not be willing to pay high interest rates
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# Adverse selection: an example

## Example: Insurance against health risk

- There are individuals who present low health risks and individuals who present high risks.
- *With complete information*, the premium to be applied should be of 1000 euro for the low risk individuals and 2000 euro for the high risk ones
- But the insurer does not know who is low risk and who is high risk **before** stipulating the insurance contract. He only knows that there are low risk individuals are about 20%. He thus adopts the following criteria to set the price at which to provide insurance:

$$P = 0,20 \times 1000 \text{ euro} + 0,80 \times 2000 \text{ euro} = 1800 \text{ euro}$$

- However at this price, **only** the high risk individuals will be willing to buy the insurance. There is an adverse selection and no insurer will be willing to sell insurance services.
- To solve the problem the public sector:
  - May directly provide some types of insurances (usually those deriving from high social risks, such as unemployment, invalidity, health, old age risks)
  - May introduce regulatory measures to support the private provision of insurance

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# Moral hazard

- A is not able to control actions B may take **after** the stipulation of the contract which affect transaction costs.
- For example in the insurance market, the insurer cannot control the insured behaviour.

## Example: insurance against theft.

- Some insured individuals may not pay attention to theft risks. With perfect information on the insured behaviour, the insurer may set the premium according to the degree of attention against theft of the insured
  - If the insurer cannot observe the insured degree of attention and/or the costs of observation (**transaction costs**) are high, insured individuals may reduce their attention and the probability of theft increases (endogeneity).
  - The risks for the insurer are too high and the market will not offer such insurance.
  - Possible solutions are again public intervention:
    - providing some types of insurances (usually those deriving from high social risks, such as unemployment, invalidity, health, old age risks)
    - introducing regulatory measures /subsidies to support the private provision of insurance
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# Summing up: a taxonomy of market failures

type of commodity	pure public good	Mixed goods with externalities	Merit goods	Pure private goods
<b>Who benefits'</b>	All in society	Consumers and society	Individual consumers	Individual consumers
<b>Exclusion of non payers</b>	impossible	Difficult or impossible	feasible	feasible
<b>Feasibility of pricing</b>	Not feasible	feasible	feasible	feasible
<b>Consumer choice</b>	none	some	full	full
<b>Impact of use on supply</b>	none	reduces supply	reduces supply	Reduces supply
<b>Who pays</b>	Taxpayer only	Consumer pay price adjusted by tax/subsidy	Consumer pay price subsidies by taxpayer	Consumers pay full costs
<b>Relation bw payment and use</b>	none	close	close	full
<b>Who decides to produce?</b>	Government only	Modified market	Modified market	Market only

## Summing up/2

- We have seen that **market failures** may ask for government intervention for efficiency reasons
- Regulation, direct public provision of goods and services, taxes and subsidies may be used to correct for market failures.
- The government may intervene also for equity reasons, to redistribute resources (we have seen that PE may be reached at different levels of initial income distribution).
- The problem is that government intervention may introduce distortions, either directly or through *taxation which affects market behaviour*. Lump sum transfers/taxes (as required by the 2° theorem) are difficult to implement, due to the lack of information.