

Principles of Economics II

Lectures 3-4: Markets, efficiency and public policy

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Context

- In Principles I, you looked at behaviour of buyers and sellers under different market conditions, and conditions under which the competitive equilibrium is **Pareto efficient**
- Sometimes markets may allocate resources in a **Pareto-inefficient way (market failure)**
 - What are the sources of these inefficiencies?
 - How can governments solve the problem?

Outline

- **External effects**
- **Public goods**
- **Asymmetric information**

Do I have too few or too many socks?



Do I have too few or too many socks?

Answer: I have exactly the right amount of socks!

How do I know?

Because I alone get the benefits and I alone bear the costs

There is no reason to think that anybody would know better



Do we have too little or too much pollution?



Do we have too little or too much pollution?

Answer: we can be pretty sure that we have too much pollution

How do we know?

Because a polluter does not bear the full costs of his/her activity

- Some costs spillover to others
- Pollution **externality** or **spillover**



A. External effects

Other examples of market failure

- **Pesticides in the Caribbean (textbook example)**
 - Banana plantation owners used harmful pesticides to reduce costs and increase their profits
 - The chemicals leaked into rivers and contaminated the local seafood (residents fall ill)
- **Overuse of antibiotics**
 - People overuse antibiotics when other treatments would be better, which creates bacteria-resistant pathogens

External effect (externality, spillover)

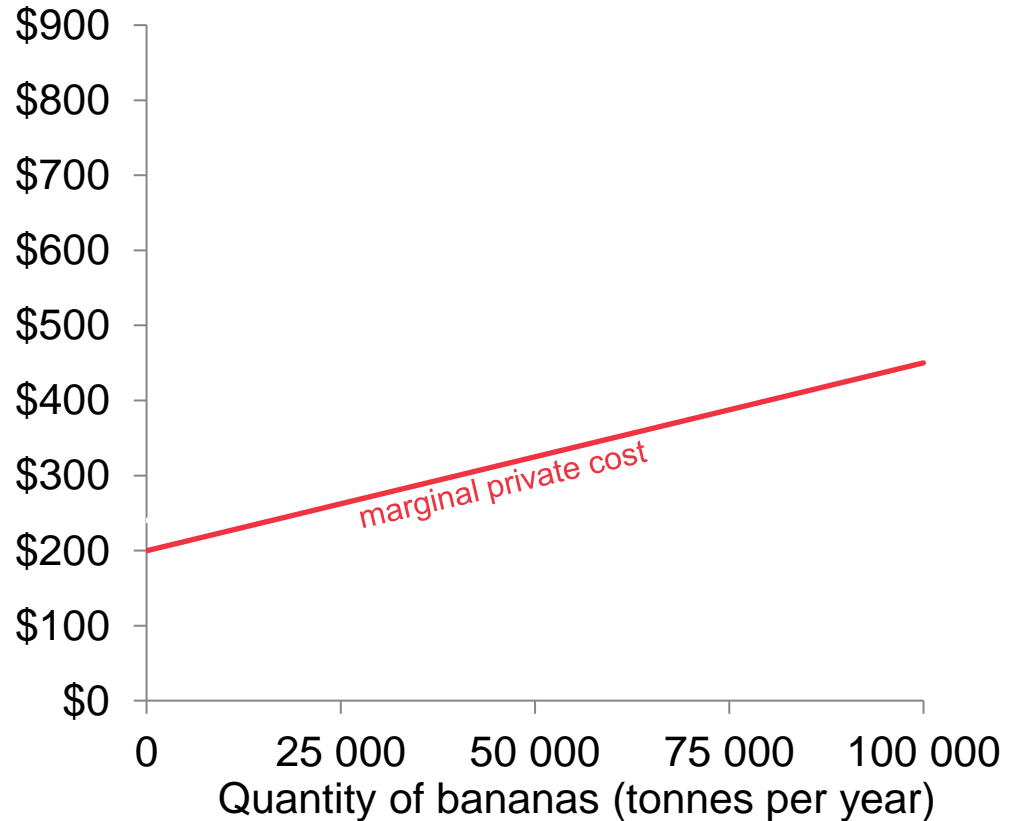
- **External effect** = an effect of an economic decision that is not specified as a benefit or liability in the contract
 - Can be **negative** (pollution, congestion) or **positive** (vaccines)
 - Also called **spillovers, externalities**
- **Leads to Pareto-inefficiency**
 - **Negative externality**: the social cost of the activity is higher than the private cost
 - **Positive externality**: the social benefit of the activity is higher than the private benefit

Incentives

- **If we want to know whether we have too much or too little of some activity, we need to look at the **incentives** faced by the relevant decision-makers**
- **Ask:**
 - Do they bear **all the costs** of their activity or do some costs **spillover to others?**
 - Do they get **all the benefits** of their activity or do some benefits **spillover to others?**
- **If not, there is an externality problem**

Negative externality

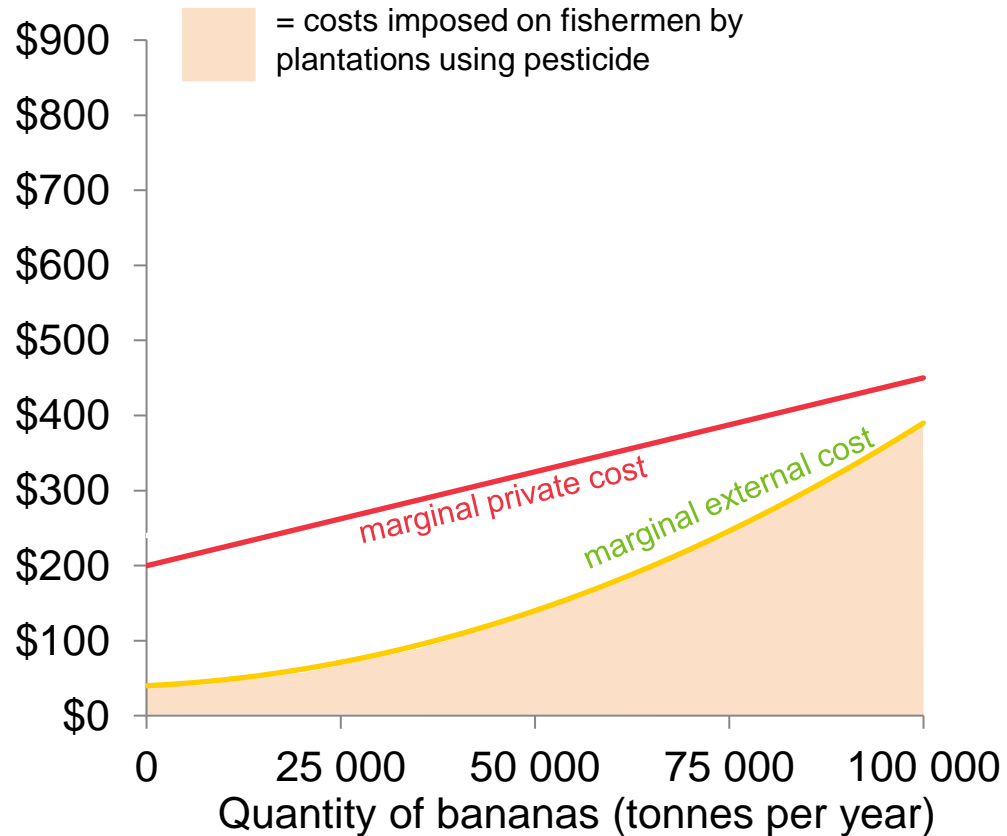
Marginal private cost (MPC) =
marginal cost to decision-maker
(plantation owners)



Negative externality

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Marginal external cost (MEC) =
costs imposed by decision-maker
on society (fishermen)

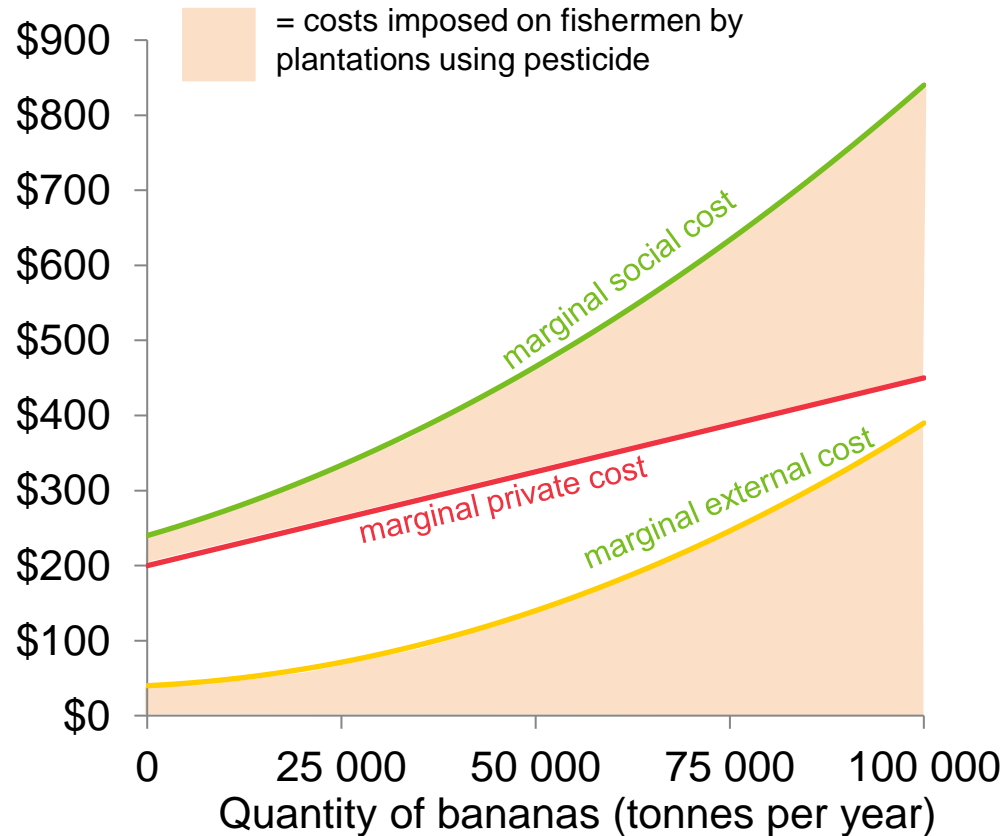


Negative externality

Marginal private cost (MPC) = marginal cost to decision-maker (plantation owners)

Marginal external cost (MEC) = costs imposed by decision-maker on society (fishermen)

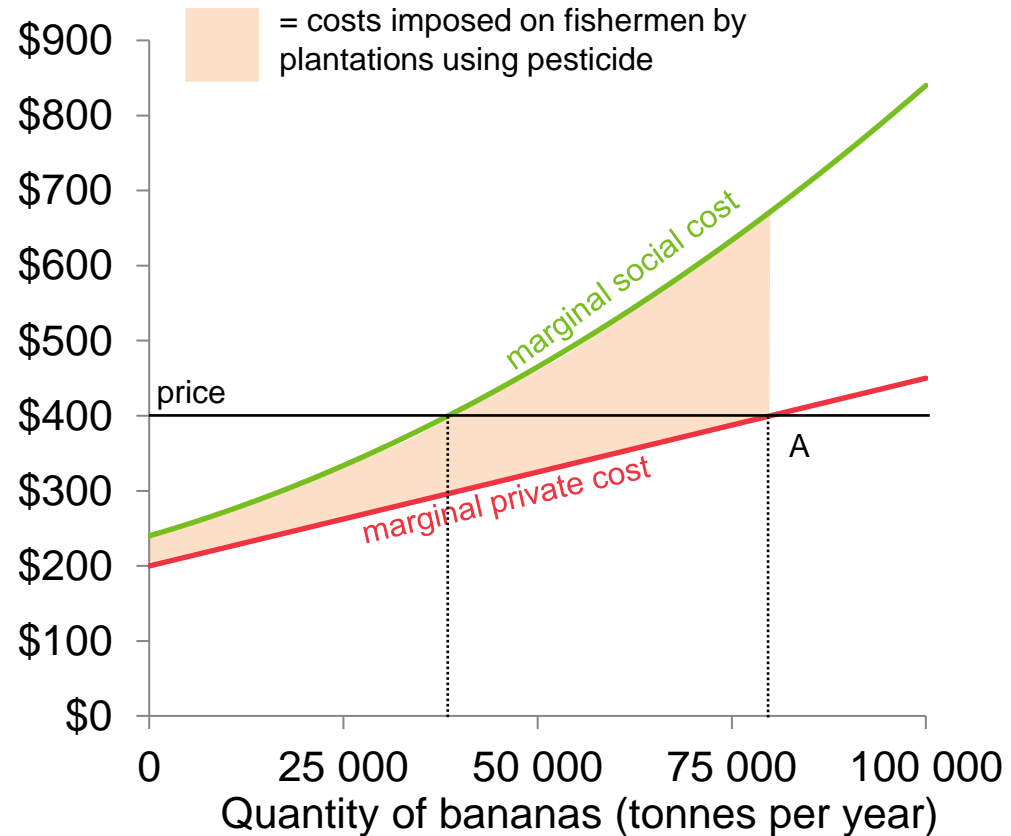
Marginal social cost (MSC) = $MPC + MEC$ (full cost to society)



Negative externality

Plantation owners maximize profits in competitive markets and produce where

price = marginal private cost (A)

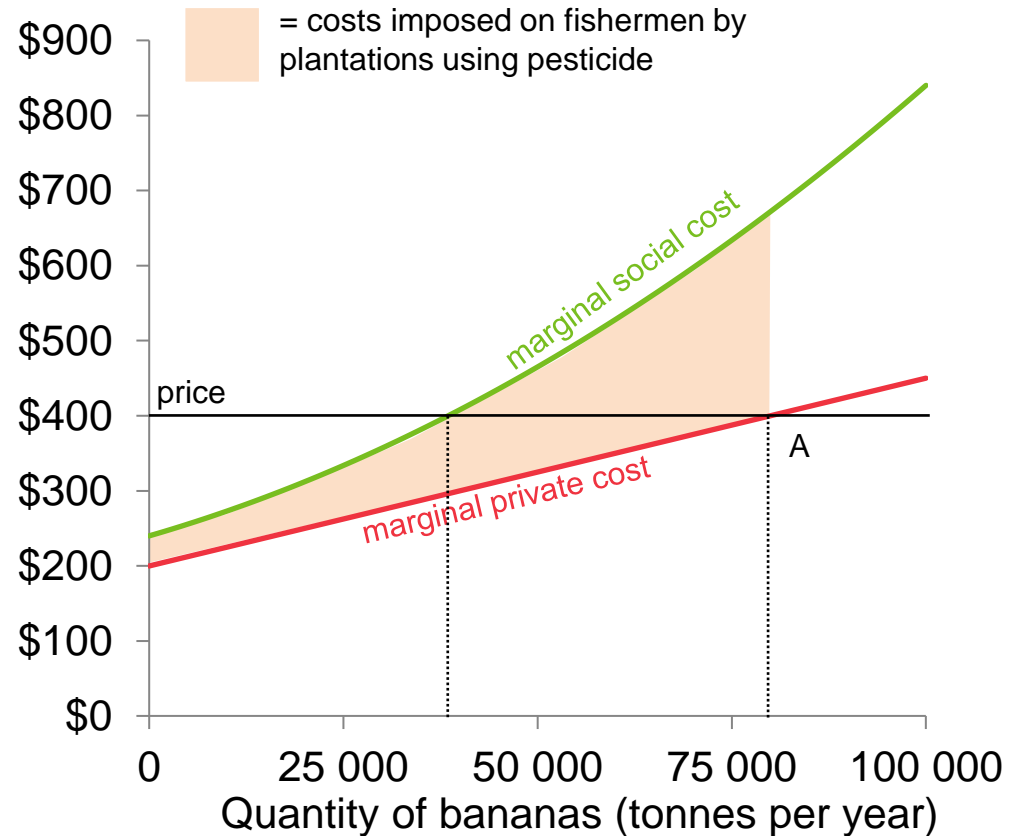


Negative externality

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But this is not Pareto-efficient



Negative externality

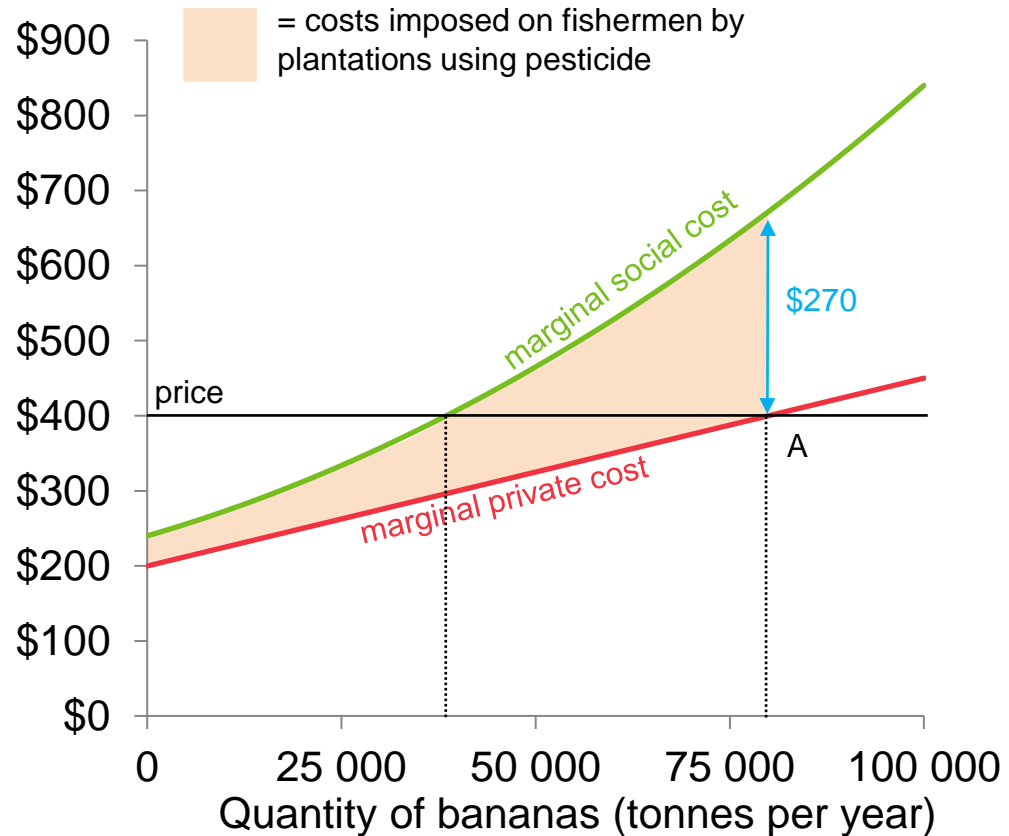
Plantation owners maximize profits in competitive markets and produce where

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But this is not Pareto-efficient

To see why, imagine that the fishermen could persuade the plantation owners to produce one tonne less

The fishermen would gain \$270, but plantations would lose hardly anything

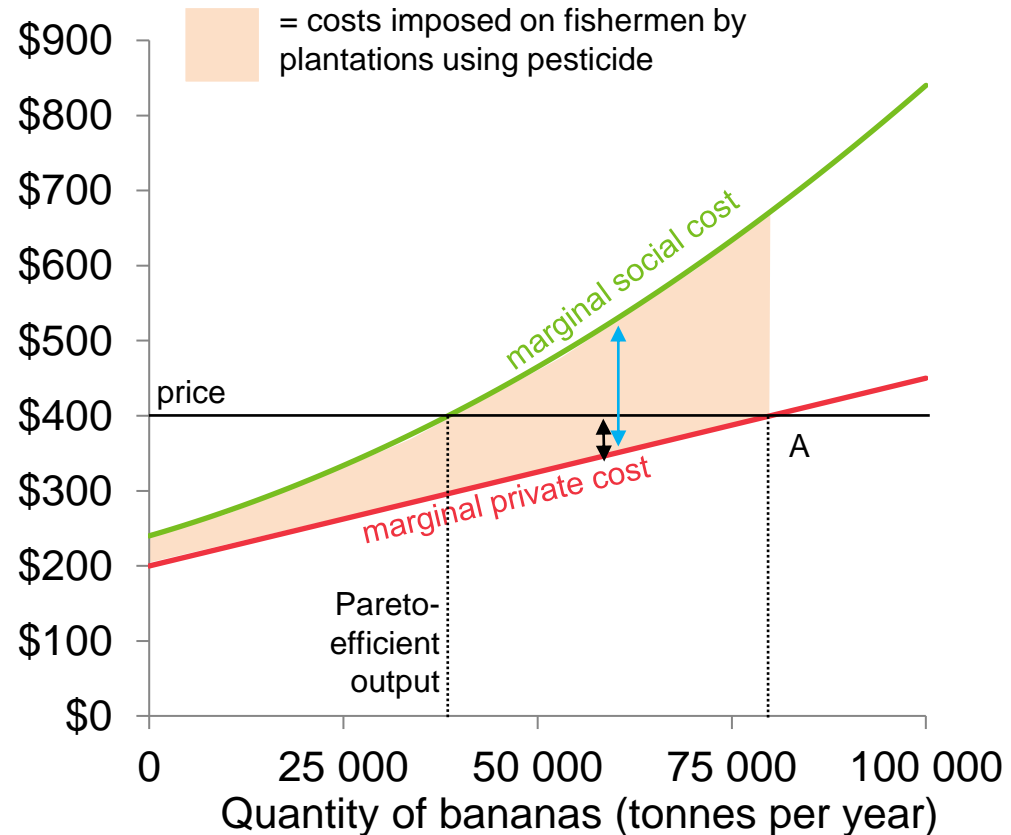


Negative externality

Moving from 79,999 to 79,998 would also benefit both groups

Using this argumentation, we can see that the point where price is equal to marginal social cost is Pareto-efficient

At this point, production is 38,000 tonnes and beyond this point it is not possible to make both plantations and fishermen better off

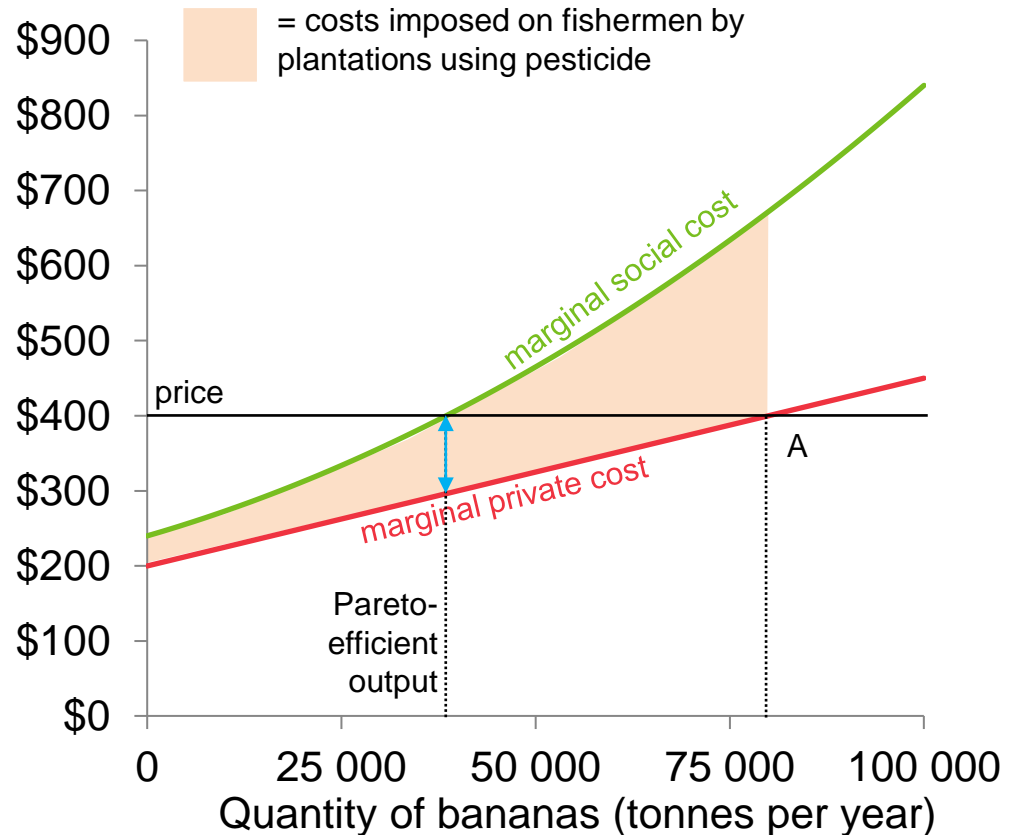


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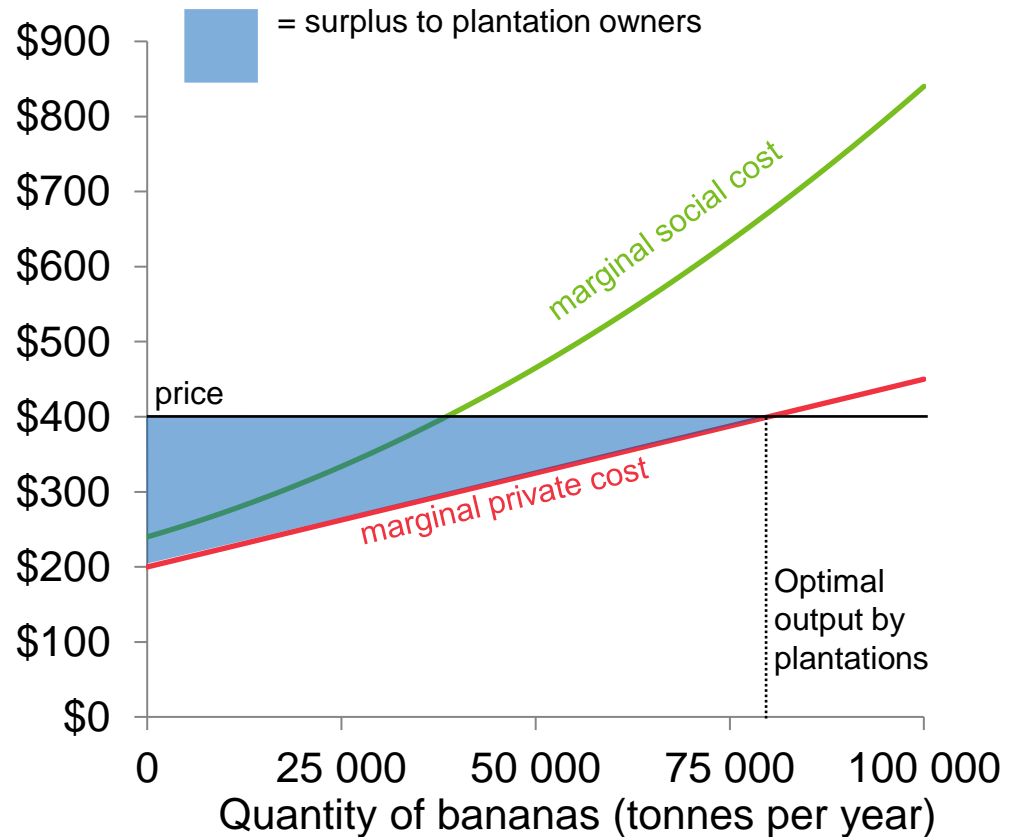
Solution #1: Bargaining

- Pareto improvement is possible: what are the different ways of achieving it?
- We already saw that fishermen could pay the plantation owners to produce less, and both would be better off
- This insight suggests a remedy that could be implemented in the real world
- **Coasean Bargaining:**
 - Legally assign **property rights** to the externality (e.g. the right to pollute, the right to clean water)
 - Private **bargaining** between parties involved will result in a Pareto-efficient allocation regardless of which party has the property rights

Bargaining solution

Pesticide use is legal

Plantation owners maximize profits in competitive markets so that **price = marginal private cost**



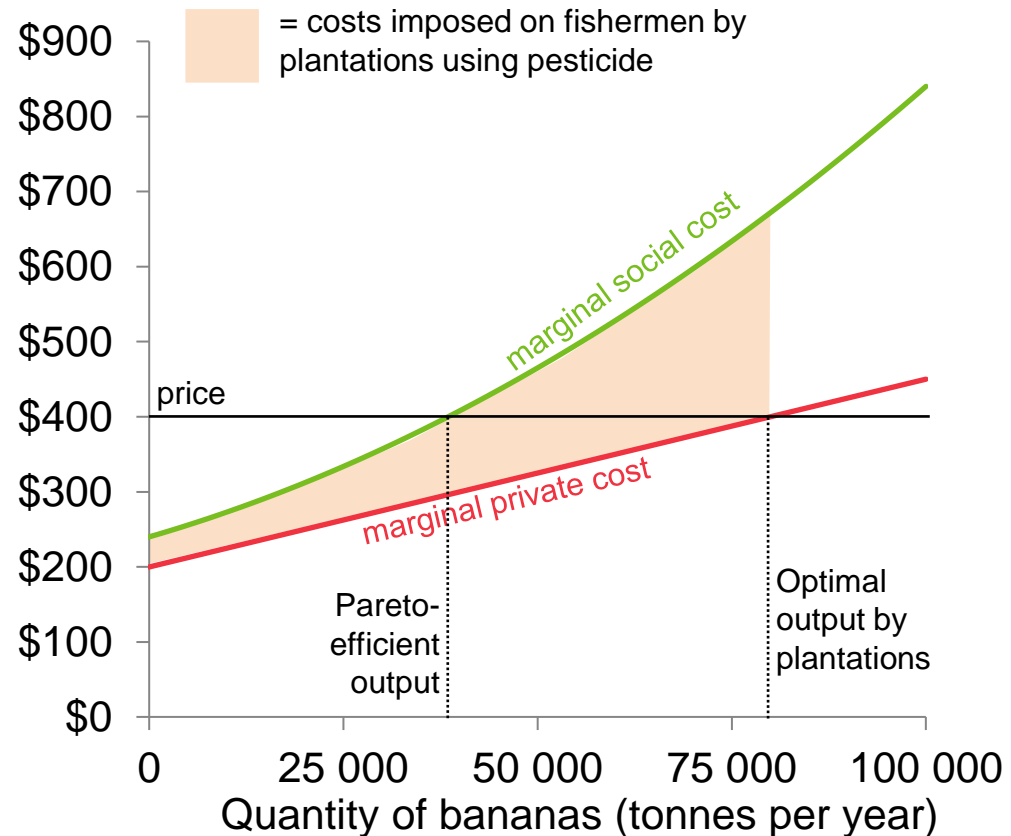
Bargaining solution

Pesticide use is legal

Plantation owners maximize profits in competitive markets so that **price = marginal private cost**

But the Pareto-efficient output would occur when **price = marginal social cost**

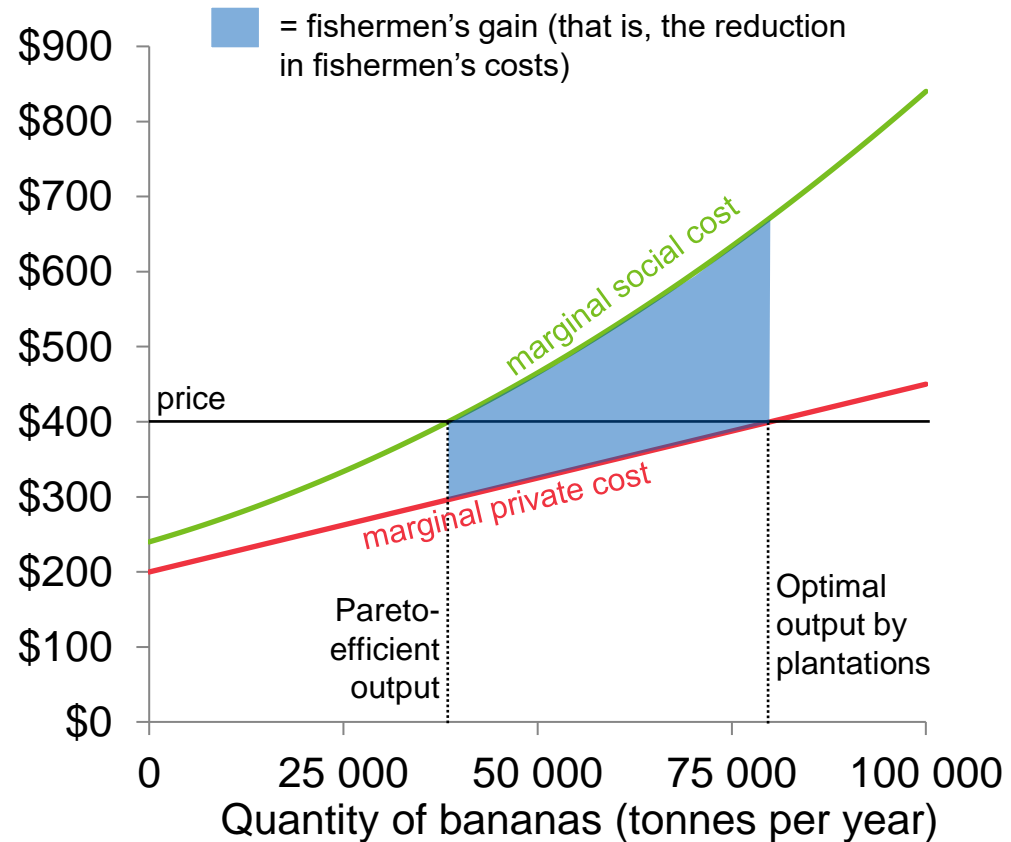
Plantation owners produce more than the Pareto-efficient amount because they do not consider the harm to fishermen from the pesticide use



Bargaining solution

What would happen if we move to the Pareto-optimum?

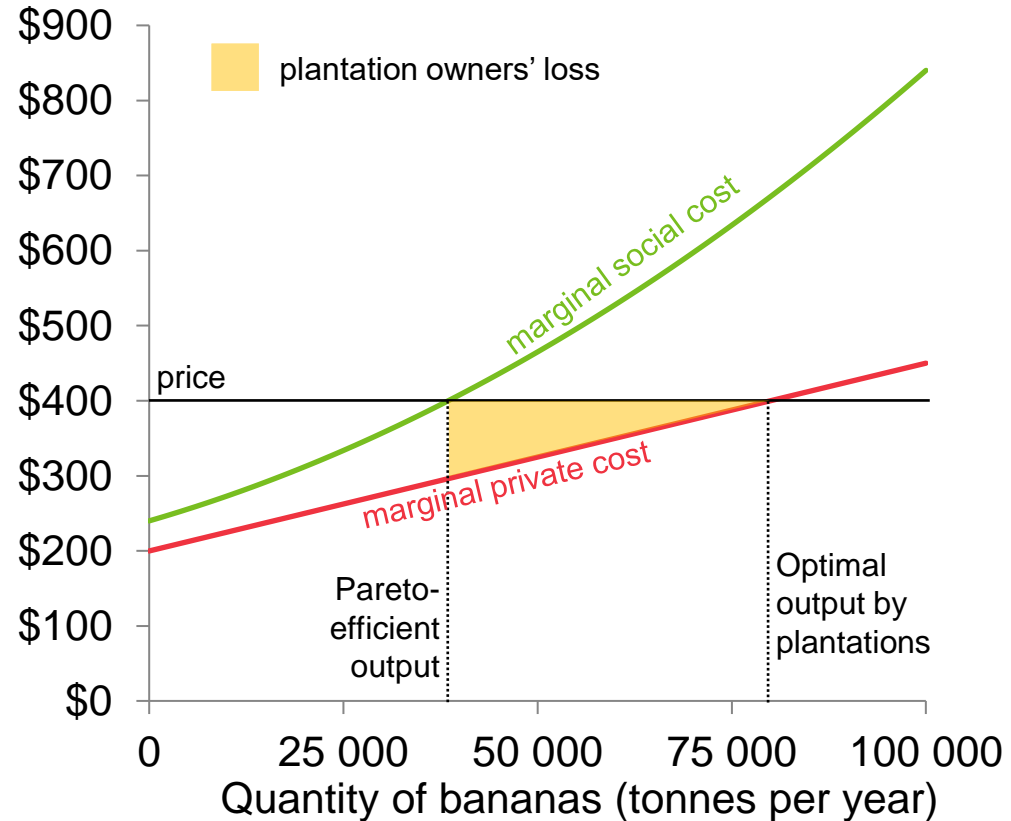
- Fishermen would gain



Bargaining solution

What would happen if we move to the Pareto-optimum?

- Fishermen would gain
- Plantation owners would lose

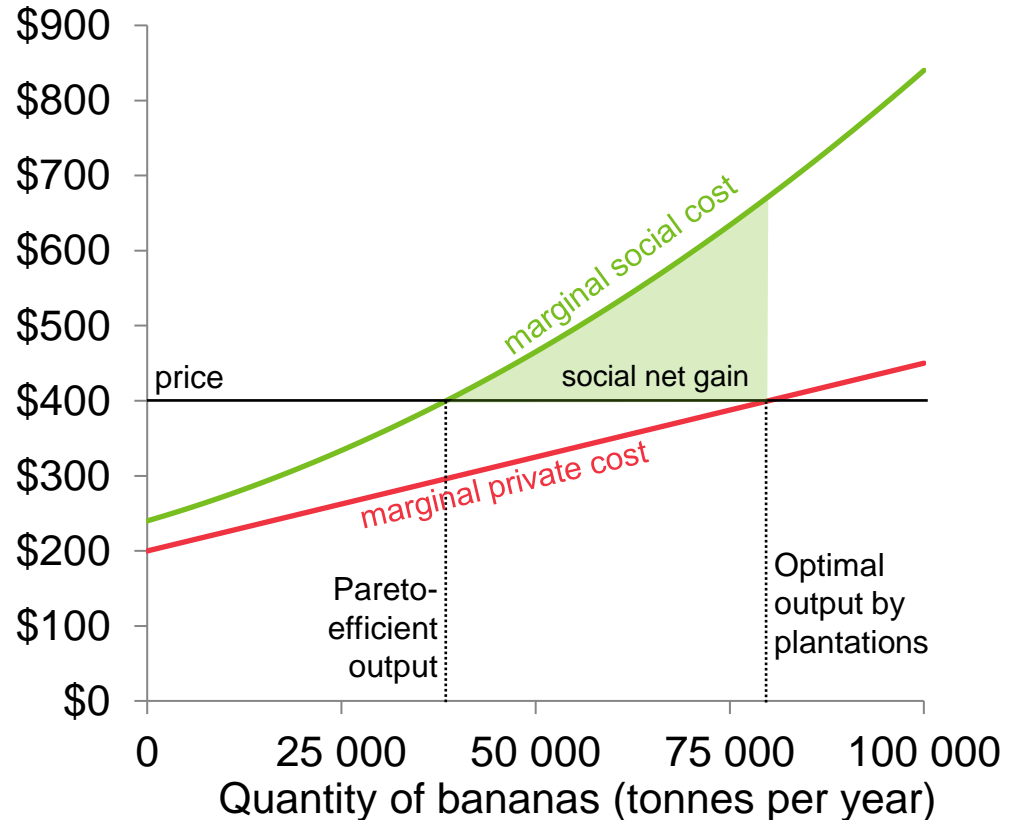


Bargaining solution

What would happen if we move to the Pareto-optimum?

- Fishermen would gain
- Plantation owners would lose
- **But less than the fishermen would gain!**

There is a net social gain that parties could share by reducing production, because the fall in plantations' profit is smaller than the gain for the fishermen



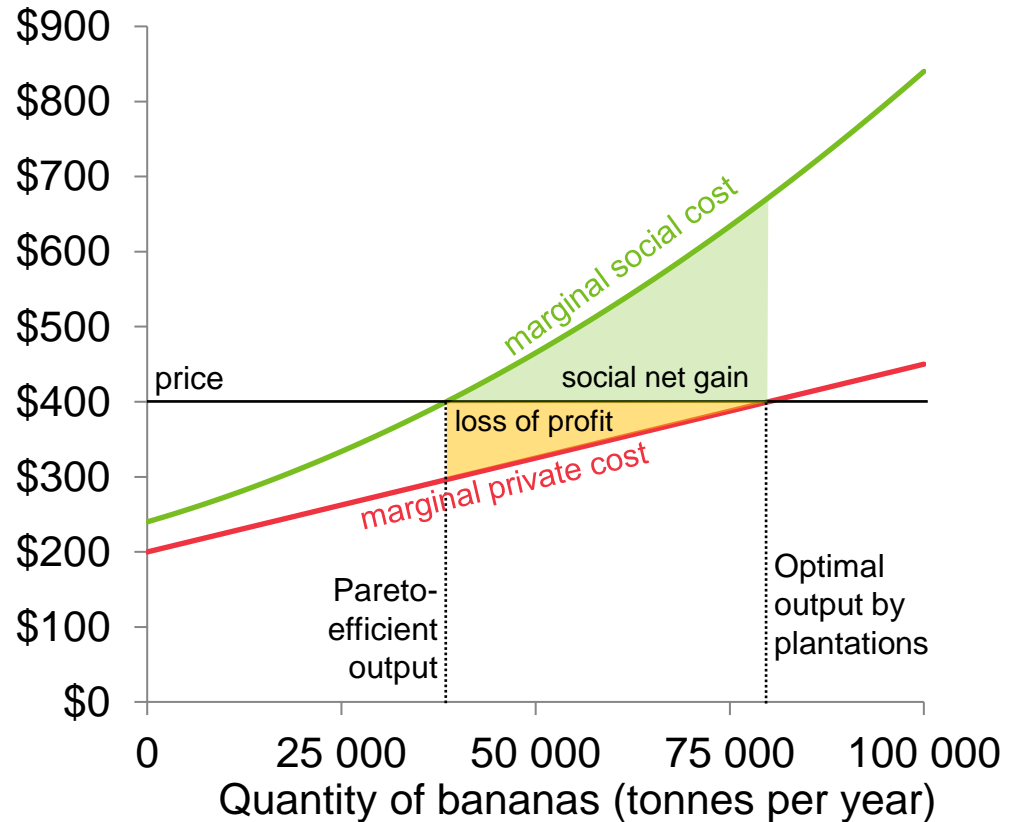
Bargaining solution

Plantation owners' **minimum acceptable offer** (minimum compensation) = lost profits

- Equally well-off producing 80,000 and producing 38,000 + receiving the minimum compensation

Fishermen's **reservation option** (maximum compensation) = the sum of yellow and green areas

Actual compensation depends on relative bargaining power



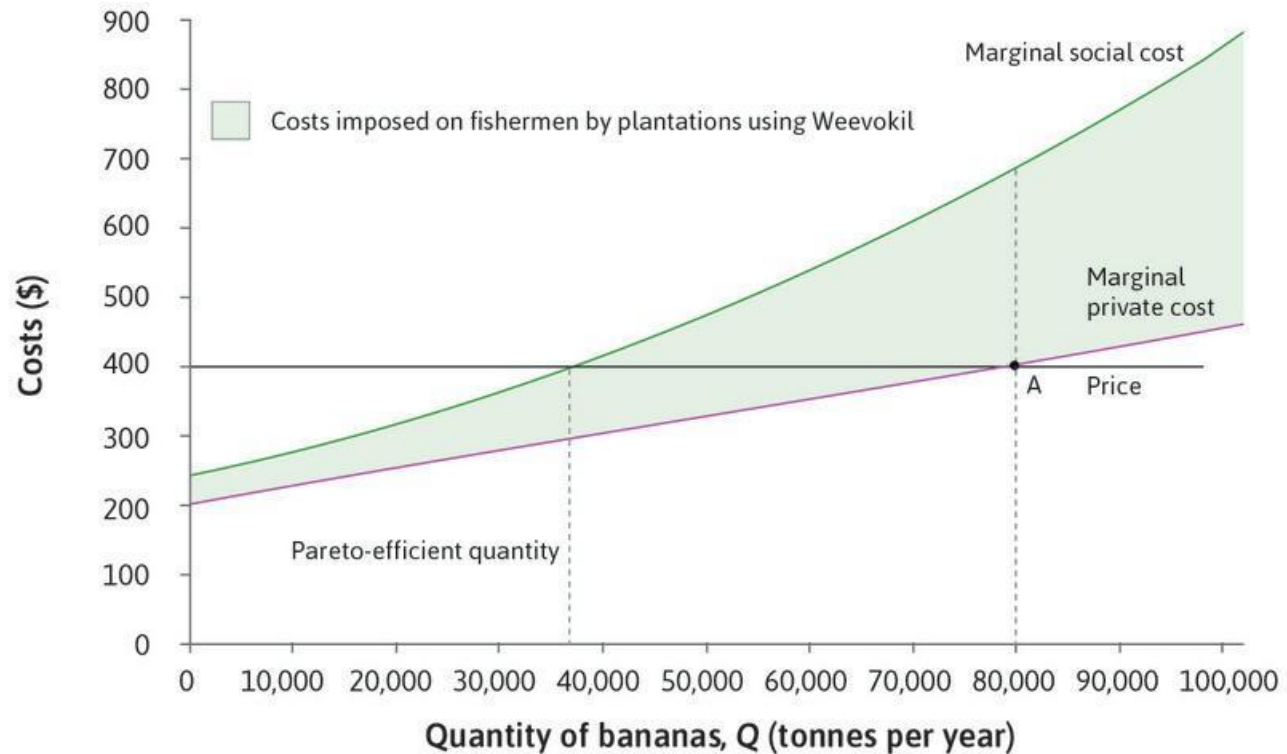
Practical limits of bargaining – transaction costs

- **Impediments to collective action** – finding a representative and agreeing on how to split the gains within each party
- **Missing information** – calculating the exact costs imposed on each fisherman and each plantation's contribution to pollution
- **Enforcement** – it may be difficult for a court to determine whether plantations have complied or not
- **Limited funds** – fishermen may not have enough money to pay plantations the compensation required

Solution #2: Government policies

1. **Regulation of production: cap at socially optimal amount**
2. **Pigouvian tax/subsidy: tax/subsidy on firms generating negative/positive external effects**
3. **Enforcing compensation for affected parties**

Example: pollution tax

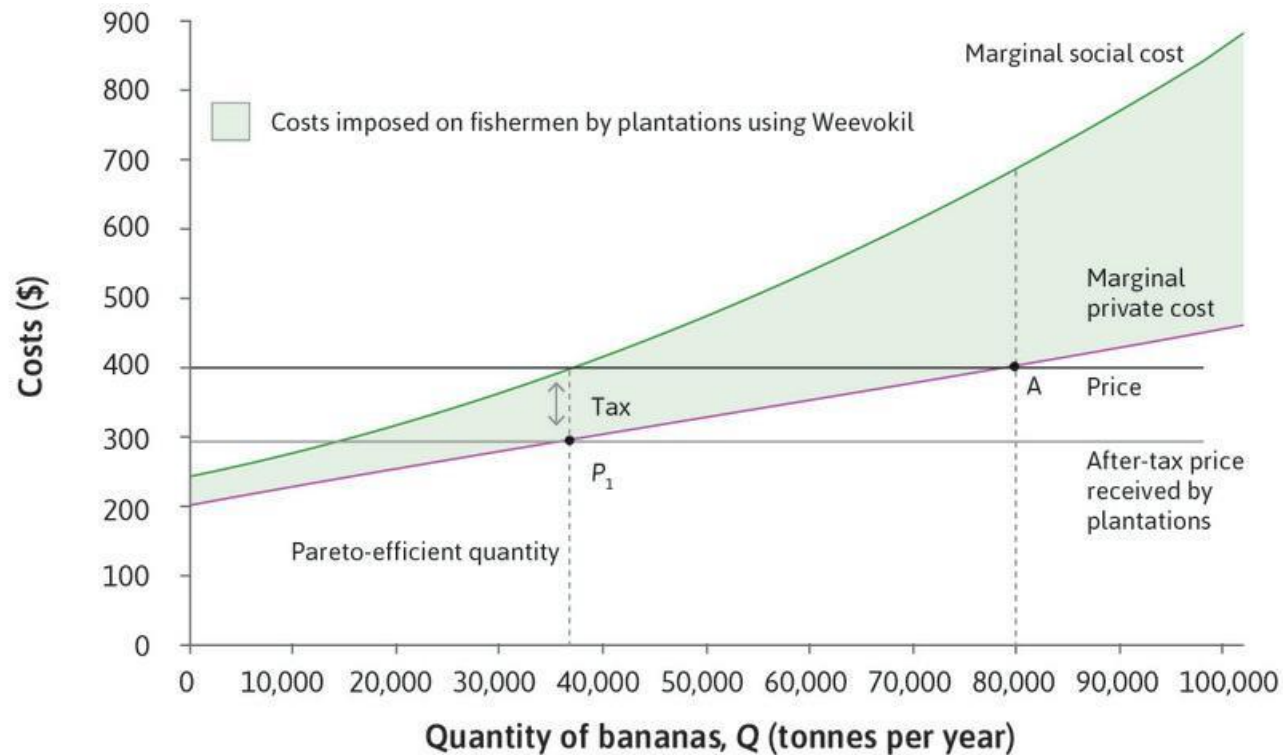


Example: pollution tax

Government puts a per-unit tax on output, equal to the MEC

Profit-maximising producer chooses output where $MPC = \text{after-tax price}$, which is the socially optimal output

The tax forces producers to face the full cost of their decisions



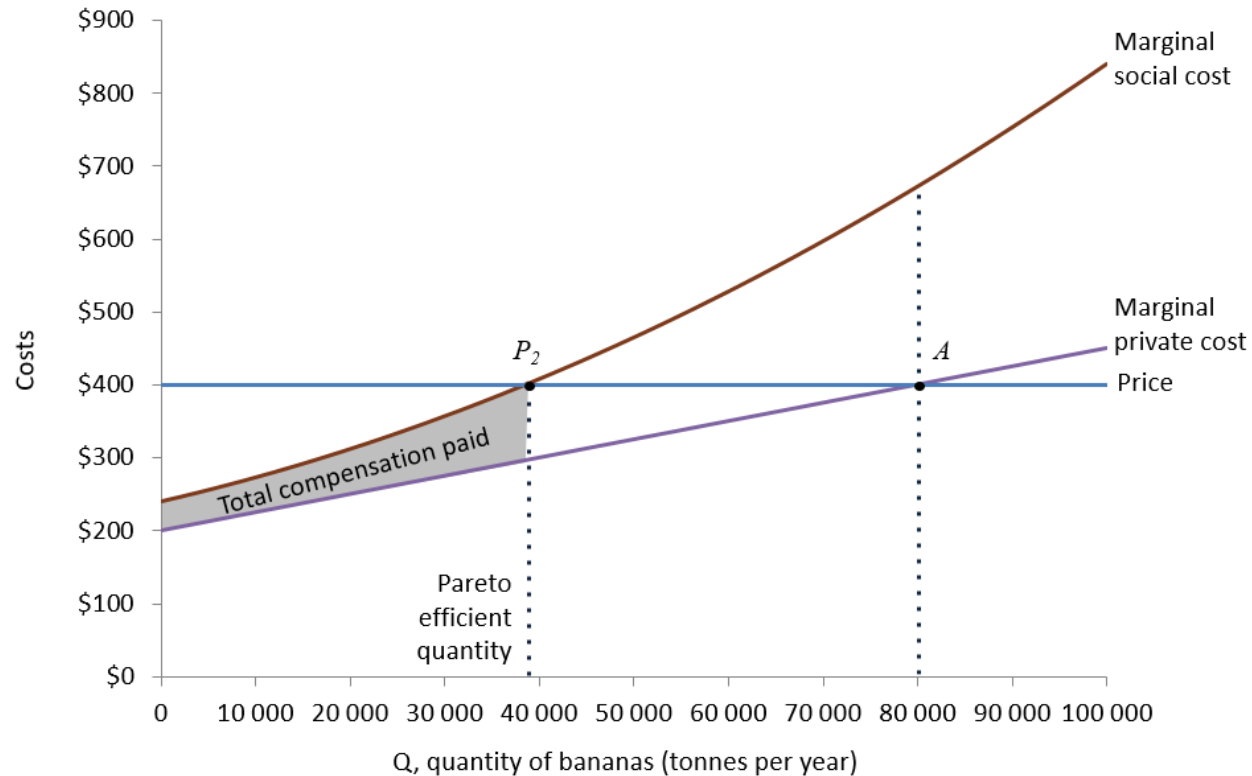
Example: compensation

Government requires plantation owners to pay fishermen **compensation** for each tonne produced

Required compensation is equal to the difference between the MSC and the MPC (grey area)

Marginal cost
=MPC+ compensation=MSC

Profit are maximized at point P_2



Practical limits of policies

- **Similar limitations to those for private bargaining:**
 - **Missing information** – government may not know the exact compensation needed to correct the problem
 - **Measurement** – Marginal social costs are difficult to measure
 - **Lobbying** – The government may favour the more powerful group, in which case it could impose a Pareto-efficient outcome that is unfair

B. Public goods

Private goods

- **Rivalry:**
 - Consumption by one individual prevents others from consuming the same good
 - If I'm wearing my jeans, no one else can wear them (food, housing, phones etc.)
- **Excludability:**
 - It is possible (and desirable) to exclude other users
 - There are well-defined property rights



Public goods

Example: Asteroid protection



Example: Asteroid protection



Source: MRUniversity: <https://mru.org/courses/principles-economics-microeconomics/public-goods-example-asteroid-defense>

Example: Asteroid protection

- **Unlike jeans, asteroid protection is not excludable**
 - If there is a system in place, you benefit regardless of whether you paid for it or not
 - You cannot be excluded from enjoying the benefits
- **In addition, your payment to the privately produced protection system will not decide whether there is such a system**
- **Only two cases to consider**
 - Either enough **other people** pay and there is a system
 - Or not enough **other people** pay and there is no system
- **You get jeans, only if you pay for them. But the protection system does not depend on your contribution at all!**

Example: Asteroid protection

- Everyone has an incentive to **freeride** or take advantage of the fact that other people are paying for the deflection system
- This is why producing jeans can be profitable for a private firm, but producing an asteroid protection system cannot
- The system will not be produced in free markets => **market failure**

Public goods

Public goods are

- **Non-rival** goods: it does not cost more to make it available for additional people (once it is available)
- **Non-excludable** goods: others cannot be *excluded* from goods' use (the free rider problem)

Note on terminology:

- The public sector produces a lot of different goods (health care, housing etc.), but only some are actual public goods
- These are not public goods even though they are provided by the public sector
- These are **publicly provided private goods!**

Private and public goods

	<u>Rival</u>	<u>Non-rival</u>
<u>Excludable</u>	Private goods <i>(food, clothes, housing)</i>	Club goods <i>(subscription TV, WiFi, knowledge subject to intellectual property rights)</i>
<u>Non-excludable</u>	Common-pool resources <i>(fish stocks, common grazing land, public roads)</i>	Public goods <i>(national defence, public broadcasts, rules of calculus)</i>

C. Asymmetric information

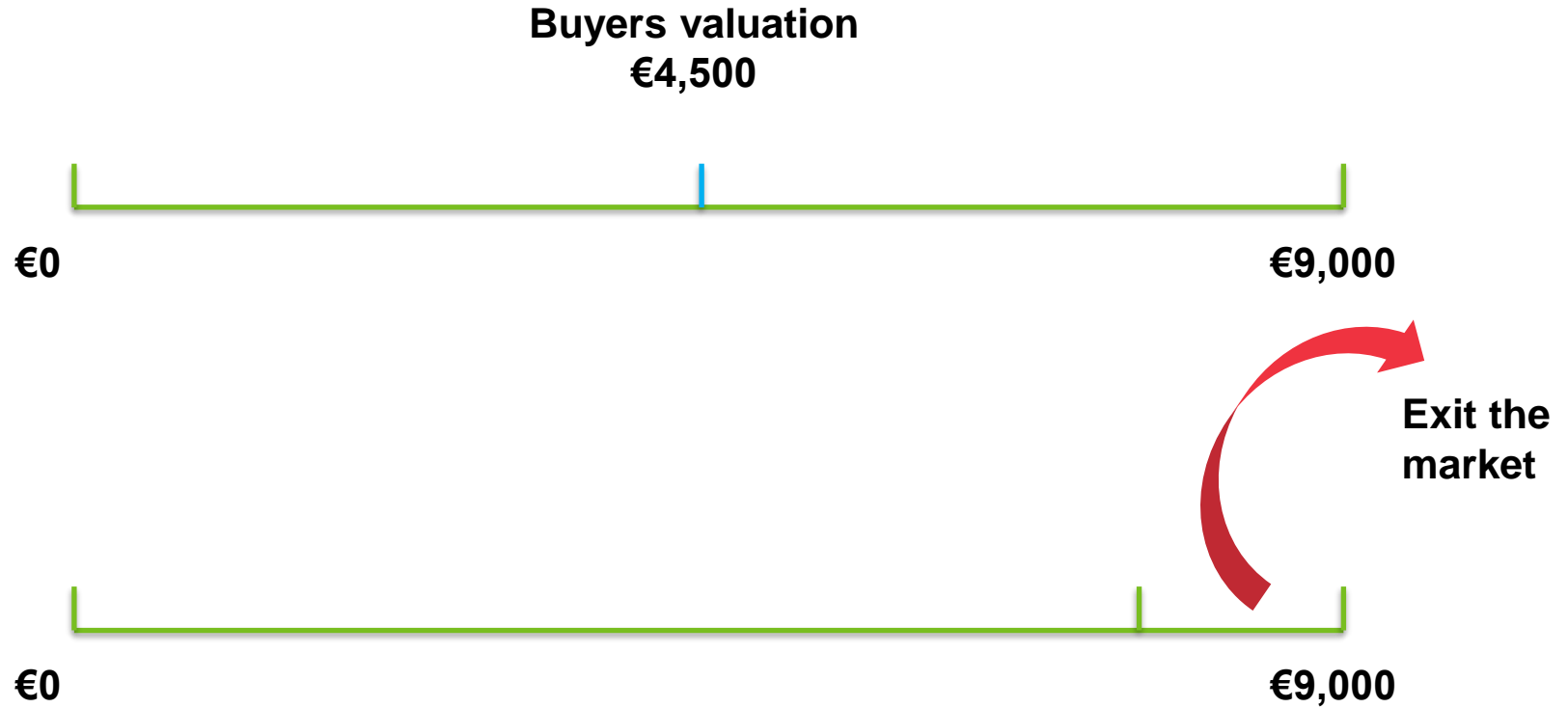
Asymmetric information

- **When information is asymmetric, one party knows something relevant to the transaction, but the other party does not**
- **Two forms of asymmetric information:**
- **Hidden action – leads to a moral hazard problem**
 - Example – Involuntary unemployment because employers cannot observe employees' exact work effort (Unit 6)
- **Hidden attributes – leads to an adverse selection problem**
 - Example – Buyers of second-hand cars do not know all the attributes of the car e.g. quality, but the sellers do

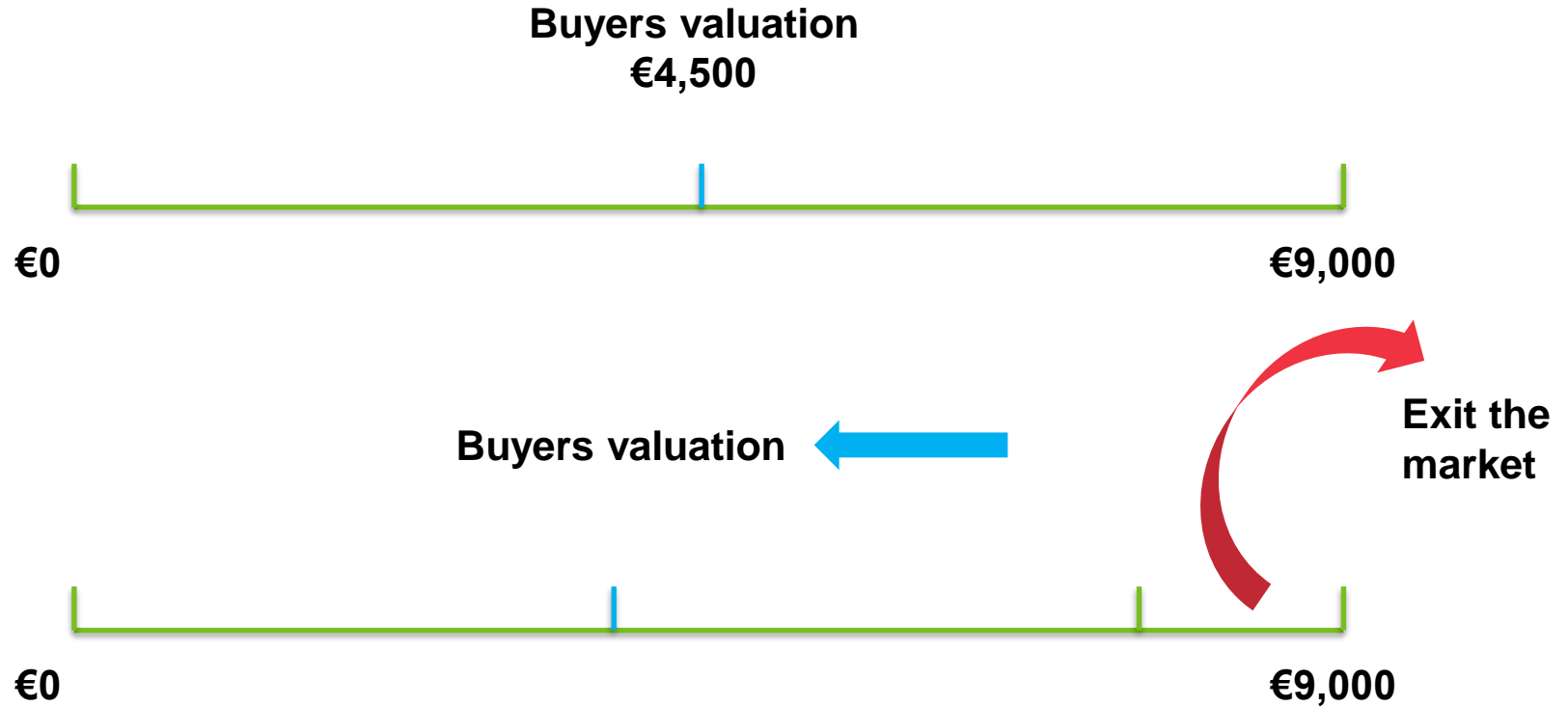
Market for lemons (Akerlof 1970)



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Market for lemons (Akerlof 1970)



Example #1: Health insurance

- **Insurance company cannot observe the health of the people buying insurance**
- **Buyers know their health status and the less healthy are more likely to buy**
 - To be profitable, the company must charge prices high enough and only the less healthy people are willing to buy
 - This **adverse selection** means that most people buying insurance already know they have a health problem
 - There is a missing market: many (healthier) people who would like to buy insurance will remain uninsured

Example #2: Car insurance

- Any form of insurance also has a hidden action problem – the buyer may **take more risks** now that he/she is insured
- **Example** – purchasing full coverage against damage may make someone more careless in driving
 - Insurance companies can put some limits in a contract, but cannot enforce other types of behaviour e.g. driving speed
 - This **moral hazard problem** is another principal-agent problem, and we can also think of it in terms of external effects (being careful gives external benefits to the company)

Example #3: The banking system

- Borrowing and lending is another **principal-agent problem** in which the borrower's decisions have external effects on the lender
 - The lender is reluctant to make loans unless the borrower can be given an incentive not to take undue risk (investing own funds)
 - For this reason, poor borrowers are often credit-constrained or credit-excluded, which is a form of credit market failure (Unit 10)
- **Another form of credit market failure is the banks themselves:**
 - If they take risks and go bankrupt, other banks (whom they have borrowed from) will bear some of the costs

Decision	How it affects others	Cost or benefit	Market failure (misallocation of resources)	Possible remedies	Terms applied to this type of market failure
A firm uses a pesticide that runs off into waterways	Downstream damage	Private benefit, external cost	Overuse of pesticide and overproduction of the crop for which it is used	Taxes, quotas, bans, bargaining, common ownership of all affected assets	Negative external benefit, environmental spillover
You take an international flight	Increase in global carbon emissions	Private benefit, external cost	Overuse of air travel	Taxes, quotas	Public bad, negative external effect
You travel to work by car	Congestion for other road users	Private cost, external cost	Overuse of cars	Tolls, quotas, subsidised public transport	Common pool resource, negative external effect
A firm invests in R&D	Other firms can exploit the innovation	Private cost, external benefit	Too little R&D	Publicly funded research, subsidies for R&D, patents	Public good, positive external effect
An employee on a fixed wage decides how hard to work	Hard work raises employer's profits	Private cost, external benefit	Too little effort; wage above reservation wage; unemployment	More effective monitoring, performance related pay, reduced conflict of interest between employer and employee	Incomplete labour contract, hidden action, moral hazard
Someone who knows he has a serious health problem buys insurance	Loss for insurance company	Private benefit, external cost	Too little insurance offered; insurance premiums too high	Mandatory purchase of health insurance, public provision, mandatory health information sharing	Missing markets, adverse selection
Someone who has purchased car insurance decides how carefully to drive	Prudent driving contributes to insurance company's profits	Private cost, external benefit	Too little insurance offered; insurance premiums too high	Installing driver monitoring devices	Missing markets, moral hazard

D. Limits to markets

Should markets allocate everything?

- **Arguments against using markets for everything:**
 - Repugnant markets: creating a market for certain goods/services would violate ethical/social norms e.g. slavery, kidneys
 - *However, see: <https://www.youtube.com/watch?v=r7vzgexzXOk>*
 - Other institutions may be more effective e.g. governments, families
 - Market mechanisms may crowd out norms of social preferences
 - Merit goods: goods that should be available to everyone, independently of their ability to pay e.g. education

Summary

- **Sources of market failure**
 - External costs or benefits
 - Public goods, common pool resources
 - Asymmetric information (hidden action/hidden attributes)
- **Possible solutions**
 - Regulation, taxation, compensation, public provision, antitrust policy
- **Limits to markets – not every good should have a market**