Lecture 02

Market Failures

Ivan Rudik
AEM 4510

Roadmap

- What are market failures?
- When do they happen?
- What are the consequences?

Market failures and the environment

The ideal world

In the best case scenario, a market equilibrium leads to the efficient allocation

The ideal world

In the best case scenario, a market equilibrium leads to the efficient allocation

The ideal world

In the best case scenario, a market equilibrium leads to the efficient allocation

We have a private bread supply curve (private MC)

The ideal world

In the best case scenario, a market equilibrium leads to the efficient allocation

We have a private bread supply curve (private MC)

We have a private bread demand curve (private MB)

The ideal world

In the best case scenario, a market equilibrium leads to the efficient allocation

We have a private bread supply curve (private MC)

We have a private bread demand curve (private MB)

In equilibrium: supply = demand so PMC = PMB = price

The ideal world

In the best case scenario, a market equilibrium leads to the efficient allocation

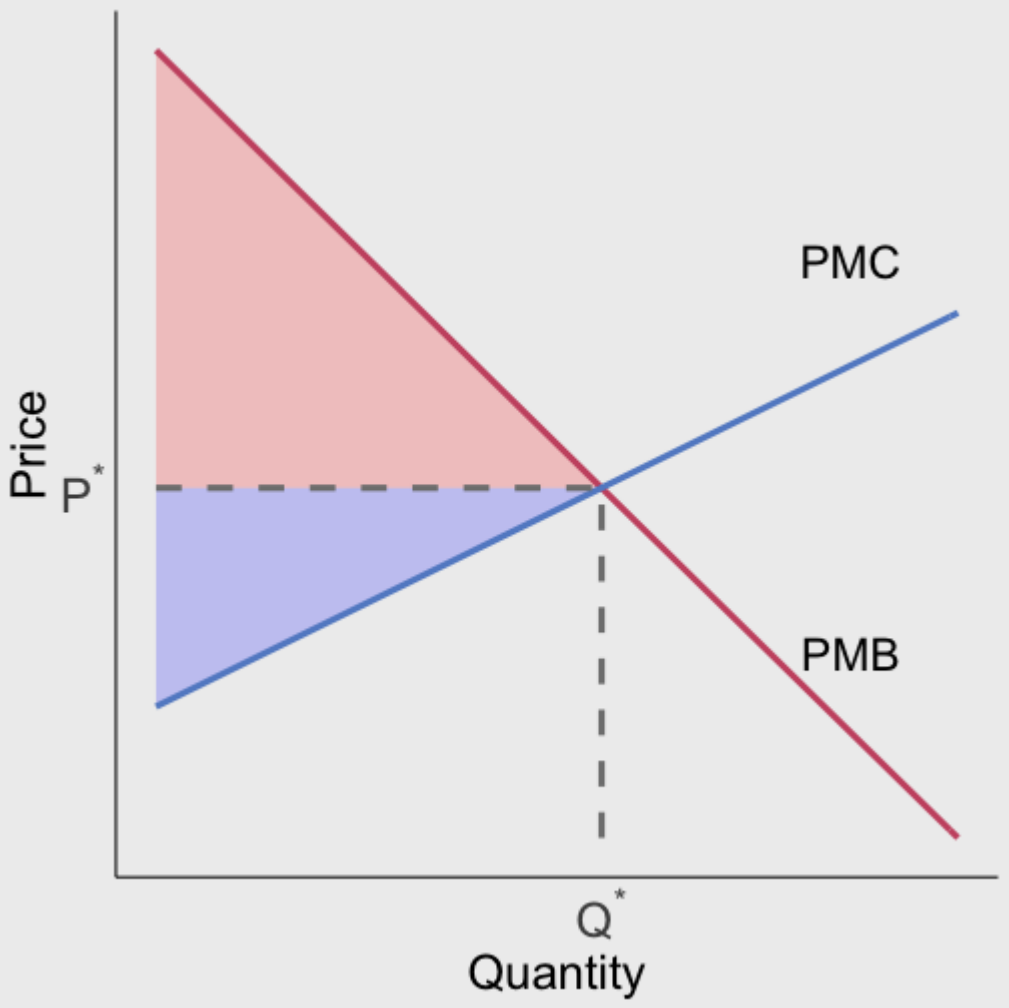
We have a private bread supply curve (private MC)

We have a private bread demand curve (private MB)

In equilibrium: supply = demand so PMC = PMB = price

For bread, the private costs and benefits are very likely the social costs and benefits

Market equilibrium

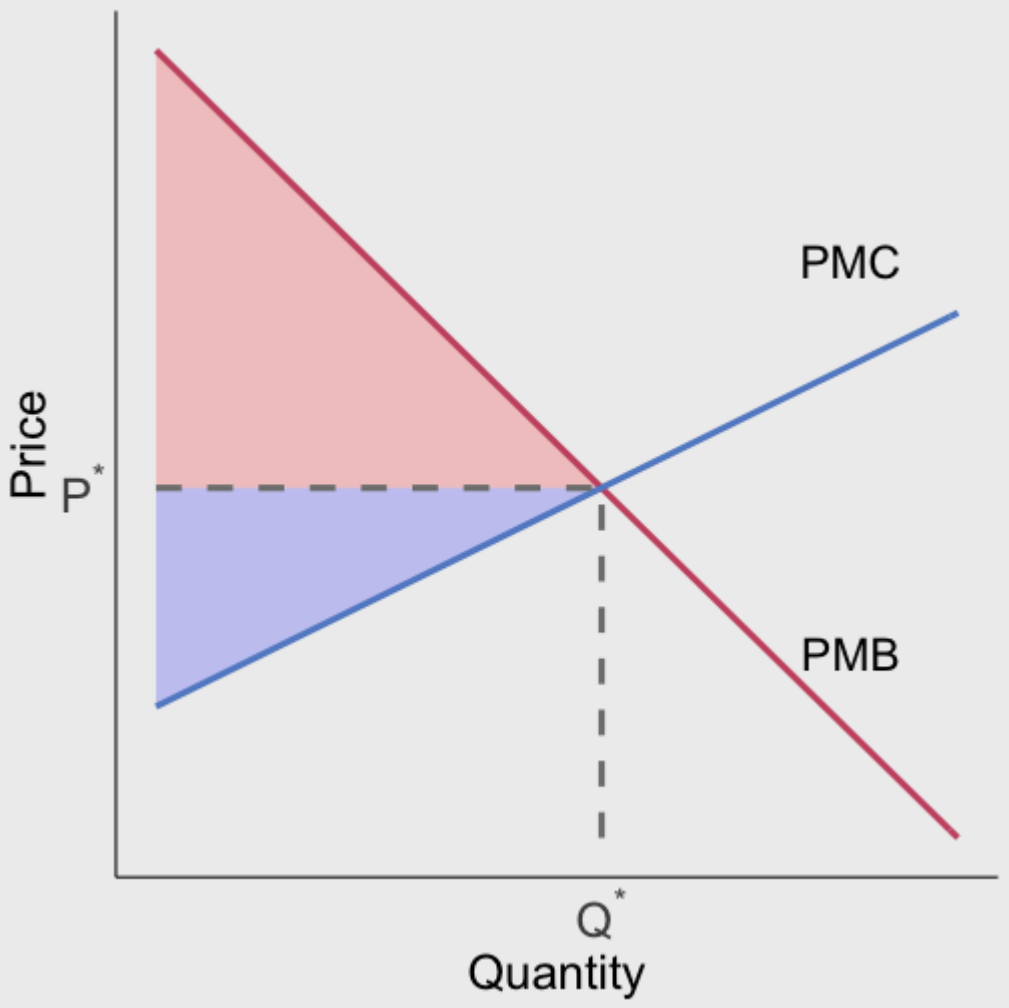


Consumer surplus is the difference between willingness to pay (demand) and price

Producer surplus is the difference between price and marginal cost (supply)

Total surplus is the sum of CS and PS

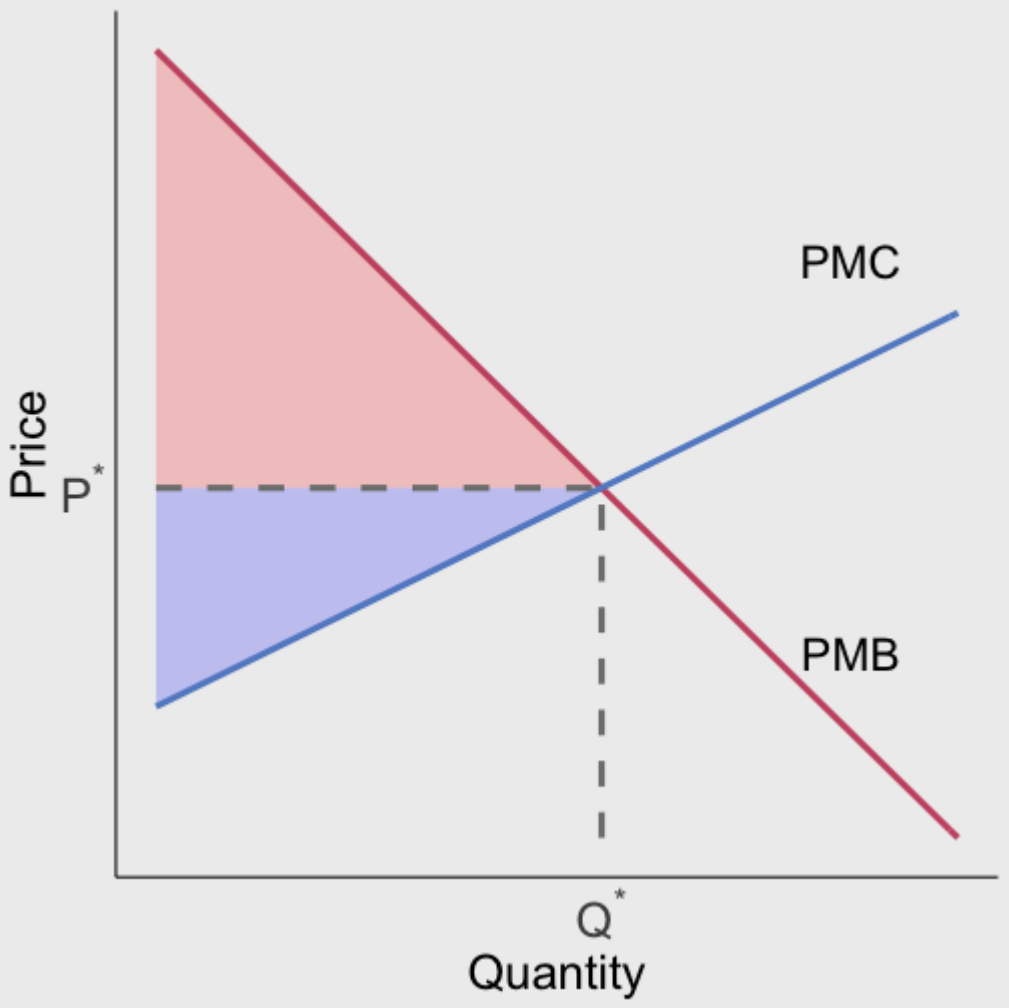
Market equilibrium



For bread, the private costs and benefits are very likely the social costs and benefits

What does this mean about the market allocation?

Market equilibrium

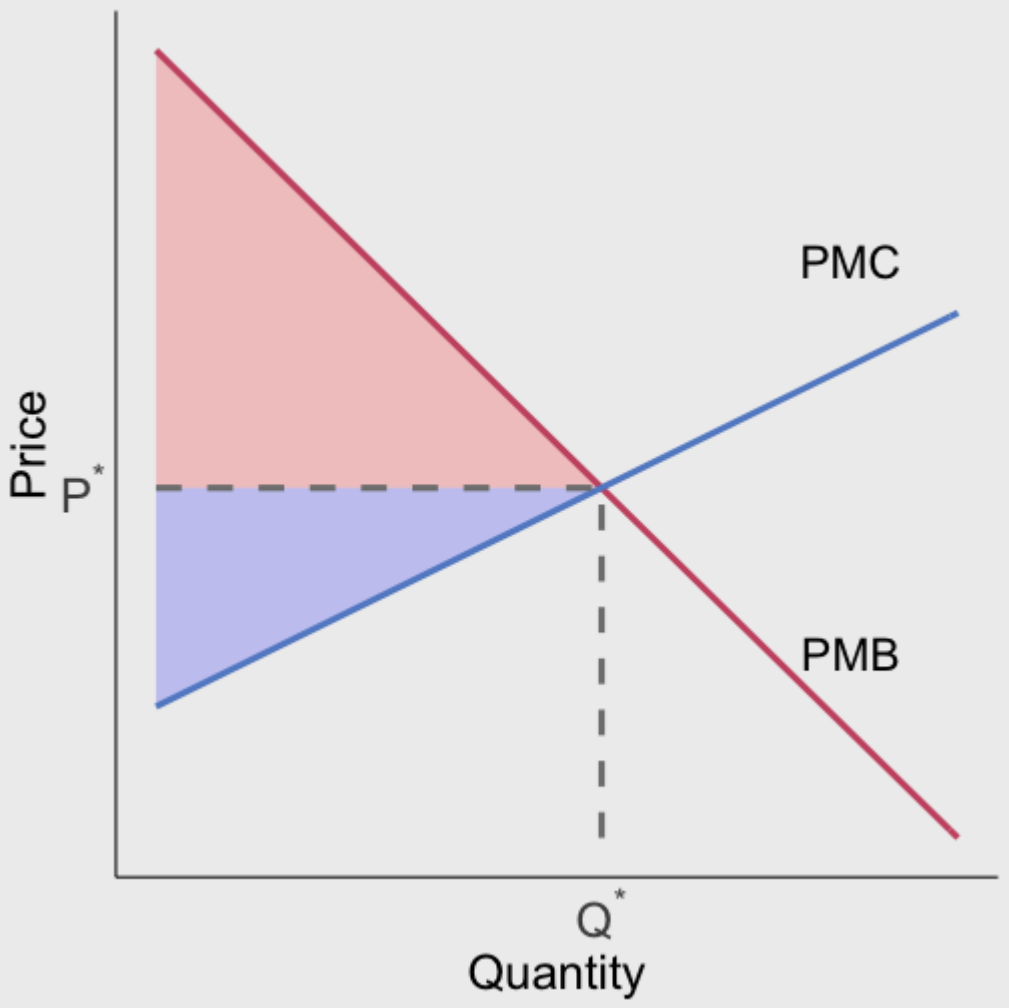


The market allocation is **efficient** because SMC = SMB

Why?

Consider deviating from (P^*, Q^*)

Market equilibrium



Cost of next unit after Q^* > benefit

Benefit of last unit $\geq$ cost of last unit

Competitive market allocations are efficient for private goods

Externalities

Externalities

If the world was just competitive markets, private goods, no third-parties, there would be no reason to do anything after Econ 101

Externalities

If the world was just competitive markets, private goods, no third-parties, there would be no reason to do anything after Econ 101

That's not the case in the real world

Externalities

If the world was just competitive markets, private goods, no third-parties, there would be no reason to do anything after Econ 101

That's not the case in the real world

In the real world we have **externalities**

> An externality exists whenever an individual or firm undertakes an action that impacts another individual or firm in an unintended way for which the latter is not compensated (a negative externality), or for which the latter does not pay (a positive externality)

Externalities

What is problem with externalities for market outcomes and efficiency?

Externalities

What is problem with externalities for market outcomes and efficiency?

There is not a market for the externality

Externalities

What is problem with externalities for market outcomes and efficiency?

There is not a market for the externality

E.g. at Wegmans or Agway you will not find some important goods on sale:

Externalities

What is problem with externalities for market outcomes and efficiency?

There is not a market for the externality

E.g. at Wegmans or Agway you will not find some important goods on sale:

- Cleaner air outside

Externalities

What is problem with externalities for market outcomes and efficiency?

There is not a market for the externality

E.g. at Wegmans or Agway you will not find some important goods on sale:

- Cleaner air outside
- Biodiversity in the Amazon

Externalities

What is problem with externalities for market outcomes and efficiency?

There is not a market for the externality

E.g. at Wegmans or Agway you will not find some important goods on sale:

- Cleaner air outside
- Biodiversity in the Amazon

The central problem is that there are goods that are **not priced**,
why is this a problem?

Externalities

What is problem with externalities for market outcomes and efficiency?

There is not a market for the externality

E.g. at Wegmans or Agway you will not find some important goods on sale:

- Cleaner air outside
- Biodiversity in the Amazon

The central problem is that there are goods that are **not priced**,
why is this a problem?

Markets rely on prices to reflect value and have people make good decisions

Externalities: several classifications

We can classify externalities in a few ways:

Externalities: several classifications

We can classify externalities in a few ways:

Production externalities:

Externalities: several classifications

We can classify externalities in a few ways:

Production externalities: generated by a firm in the process of producing some output (e.g. pollution, innovation)

Externalities: several classifications

We can classify externalities in a few ways:

Production externalities: generated by a firm in the process of producing some output (e.g. pollution, innovation)

Consumption externalities:

Externalities: several classifications

We can classify externalities in a few ways:

Production externalities: generated by a firm in the process of producing some output (e.g. pollution, innovation)

Consumption externalities: generated by an individual in the process of consuming an output (e.g. congestion, vaccination)

Externalities: several classifications

We can classify externalities in a few ways:

Production externalities: generated by a firm in the process of producing some output (e.g. pollution, innovation)

Consumption externalities: generated by an individual in the process of consuming an output (e.g. congestion, vaccination)

Negative externalities:

Externalities: several classifications

We can classify externalities in a few ways:

Production externalities: generated by a firm in the process of producing some output (e.g. pollution, innovation)

Consumption externalities: generated by an individual in the process of consuming an output (e.g. congestion, vaccination)

Negative externalities: imposes external **costs** (e.g. pollution)

Externalities: several classifications

We can classify externalities in a few ways:

Production externalities: generated by a firm in the process of producing some output (e.g. pollution, innovation)

Consumption externalities: generated by an individual in the process of consuming an output (e.g. congestion, vaccination)

Negative externalities: imposes external **costs** (e.g. pollution)

Negative externalities:

Externalities: several classifications

We can classify externalities in a few ways:

Production externalities: generated by a firm in the process of producing some output (e.g. pollution, innovation)

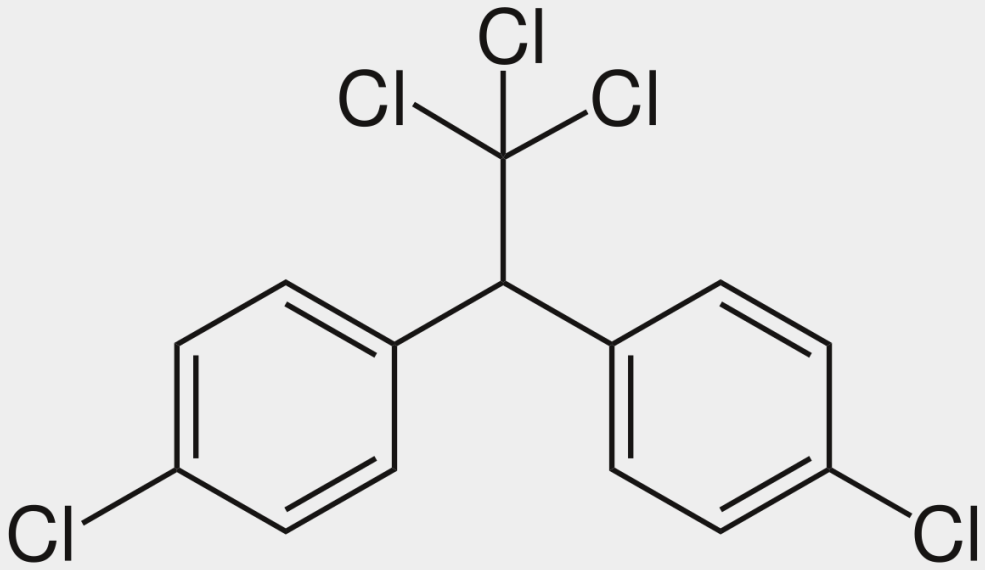
Consumption externalities: generated by an individual in the process of consuming an output (e.g. congestion, vaccination)

Negative externalities: imposes external **costs** (e.g. pollution)

Negative externalities: imposes external **benefits** (e.g. vaccination)

Negative externalities: what is this?

Negative externalities: DDT, shockingly bad for you

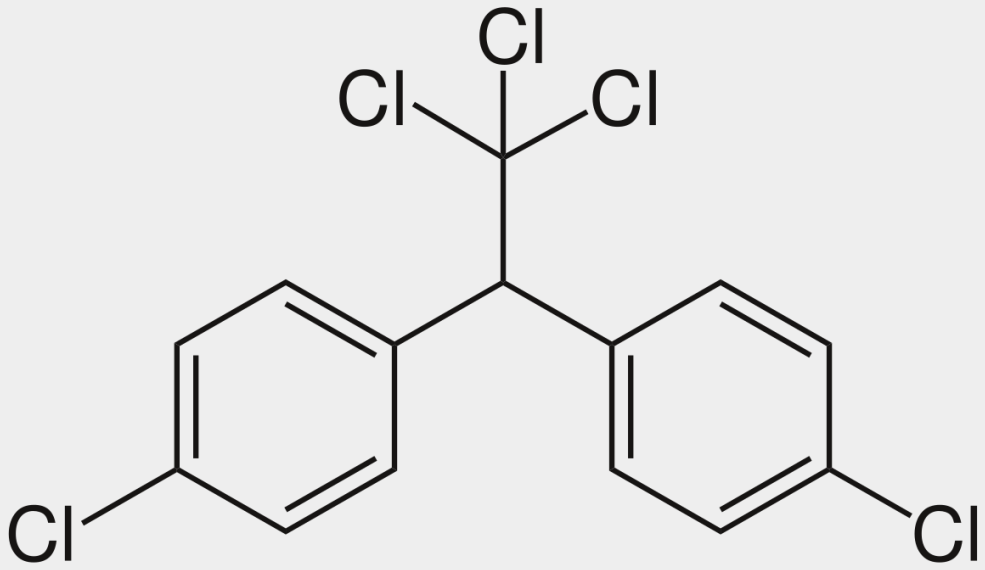


DDT is a chemical that was was widely used as an insecticide in the early-mid 1900s

Widely used to eradicate Typhus and Malaria

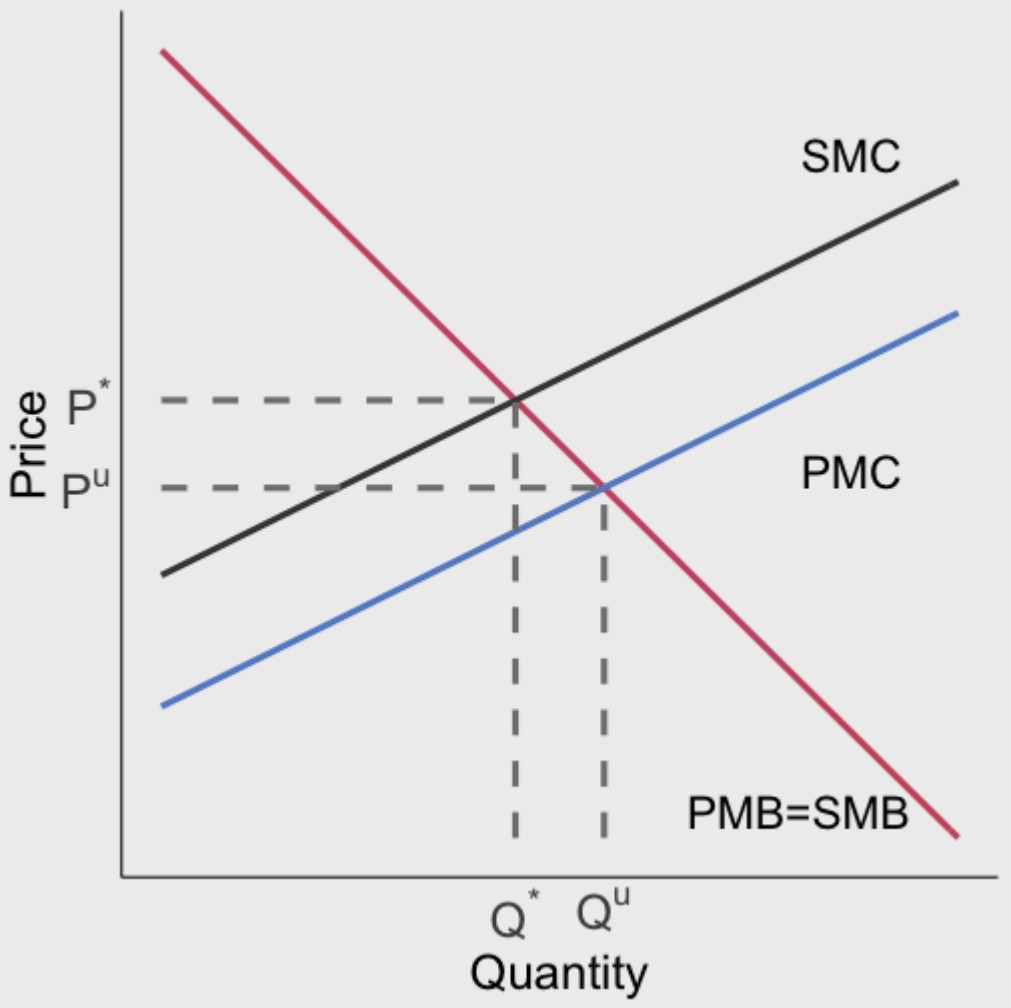
Used to treat lice

Negative externalities: DDT, gives you cancer



A relationship between DDT exposure and reproductive effects in humans is suspected, based on studies in animals. In addition, some animals exposed to DDT in studies developed liver tumors. As a result, today, DDT is classified as a probable human carcinogen.

Negative externalities: graphical

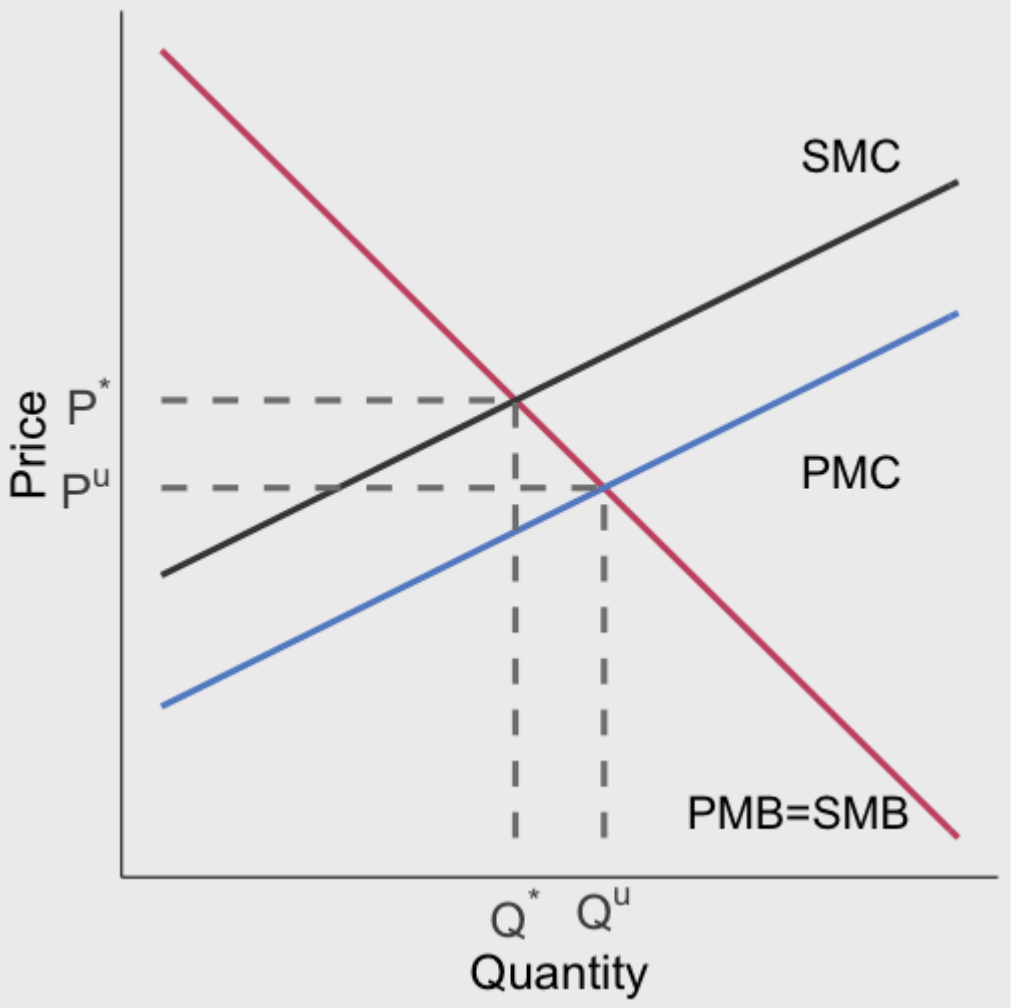


Social marginal cost (SMC) is the sum of private marginal cost (PMC) and the external marginal cost (EMC)

The PMC curve only reflects the **private costs** of making the DTT

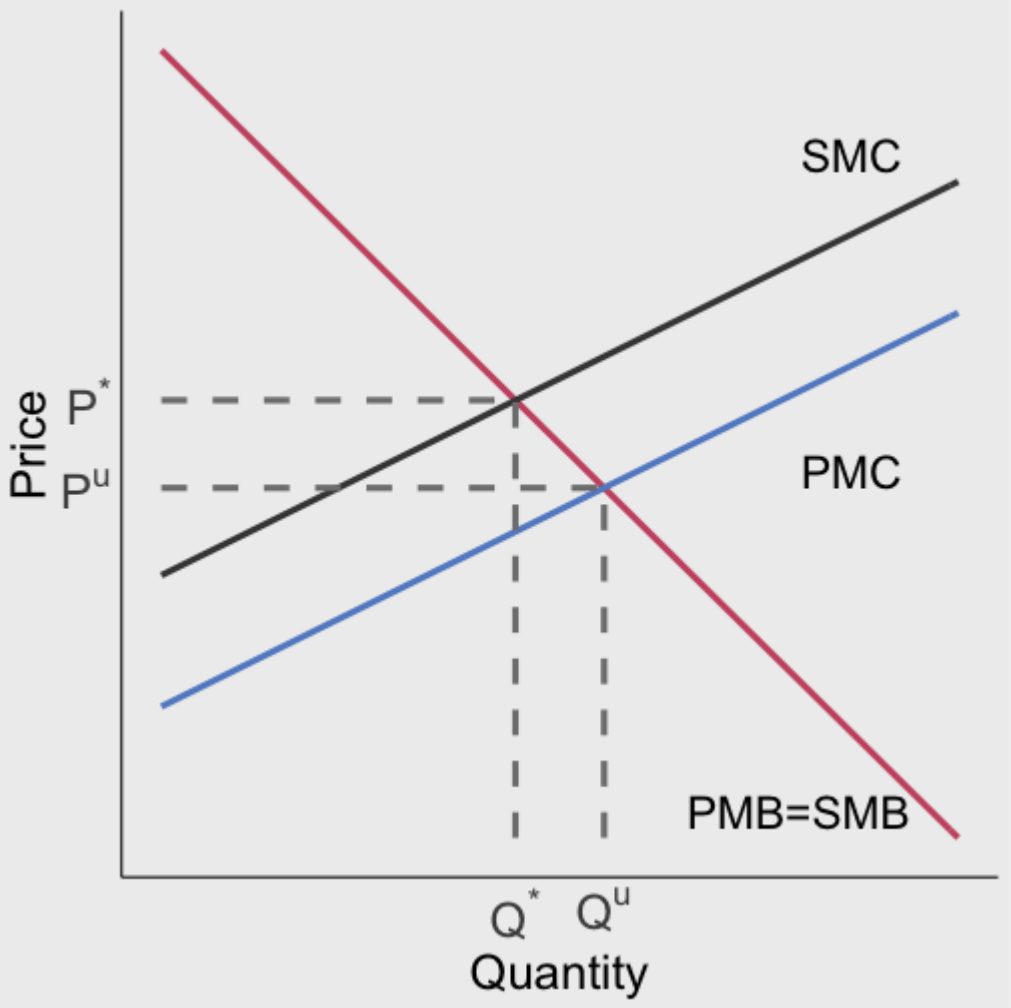
It does not account for the external health and wildlife costs

Negative externalities: graphical



Adding the private and external marginal costs together gives us the SMC, what we care about from the social planner or regulator's perspective

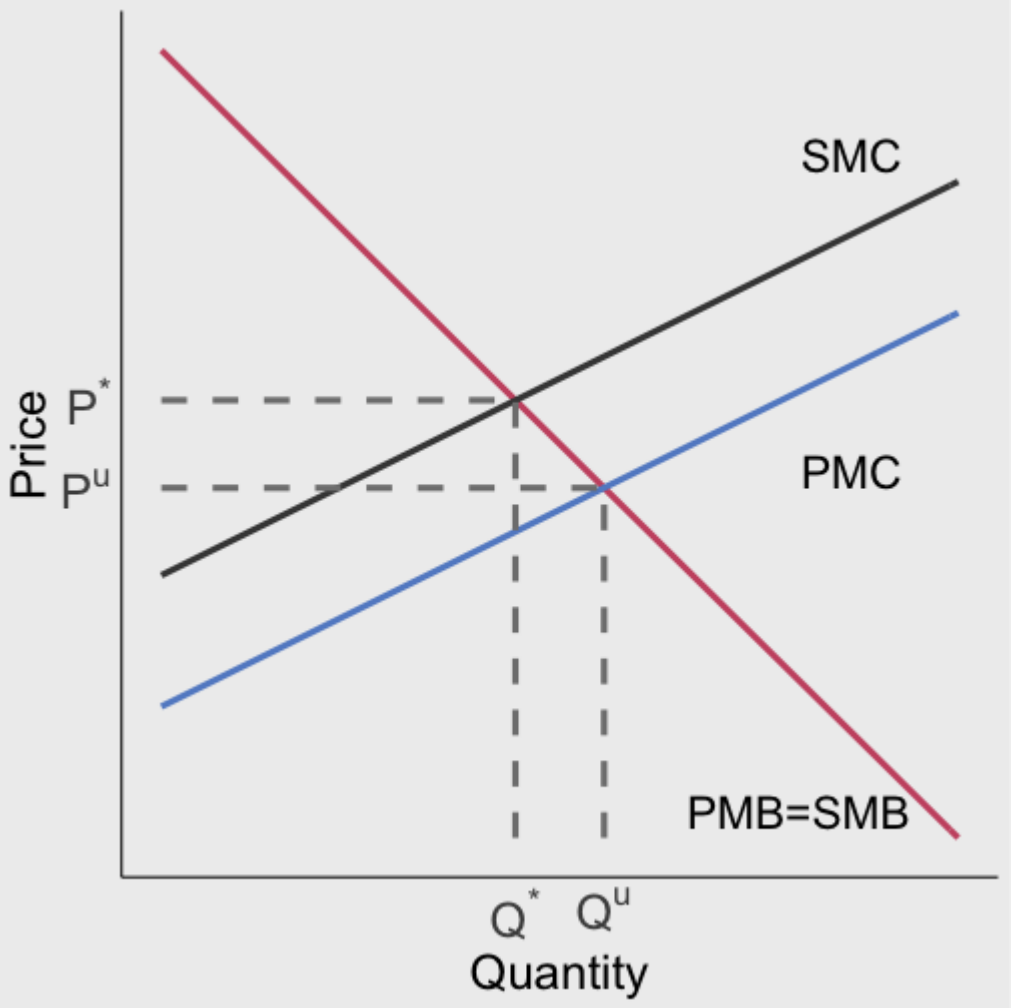
Negative externalities: graphical



Adding the private and external marginal costs together gives us the SMC, what we care about from the social planner or regulator's perspective

The unregulated market gives us (P^u, Q^u) as an outcome when we want (P^*, Q^*)

Negative externalities: graphical

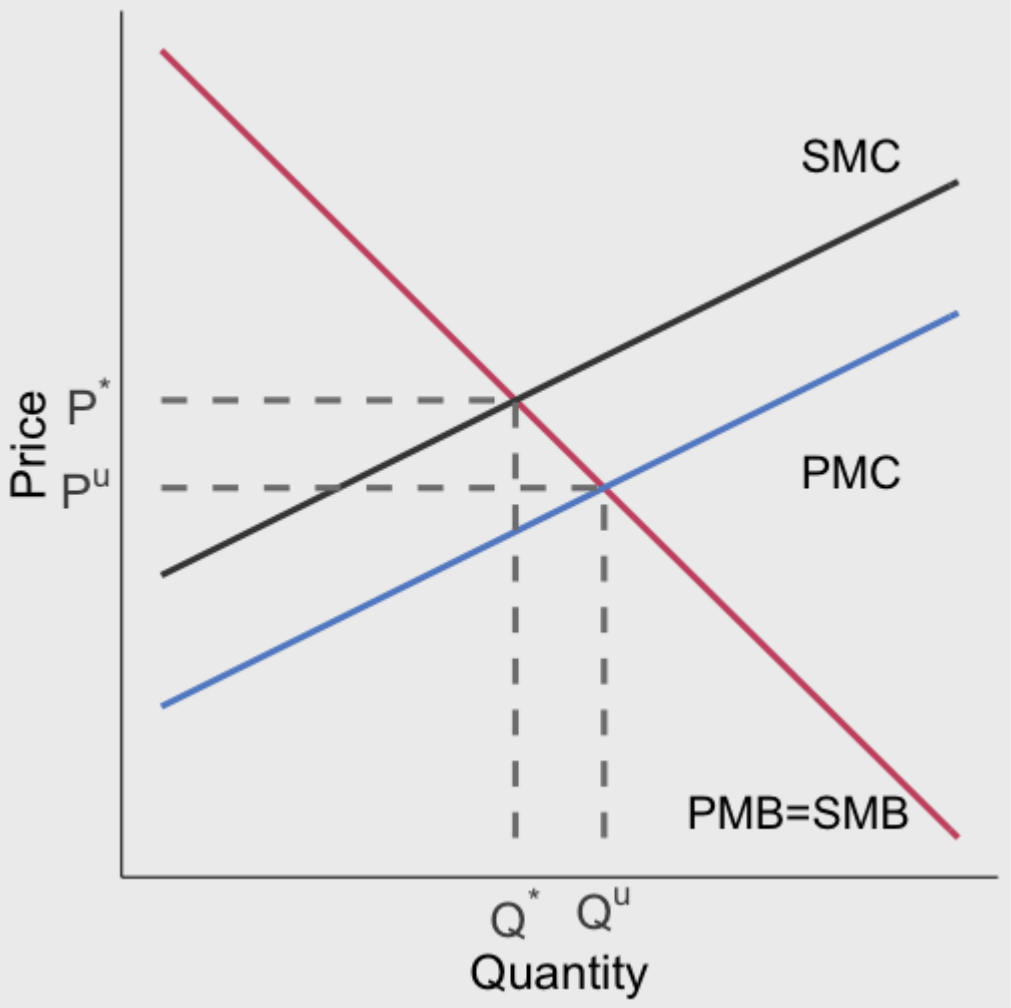


Adding the private and external marginal costs together gives us the SMC, what we care about from the social planner or regulator's perspective

The unregulated market gives us (P^u, Q^u) as an outcome when we want (P^*, Q^*)

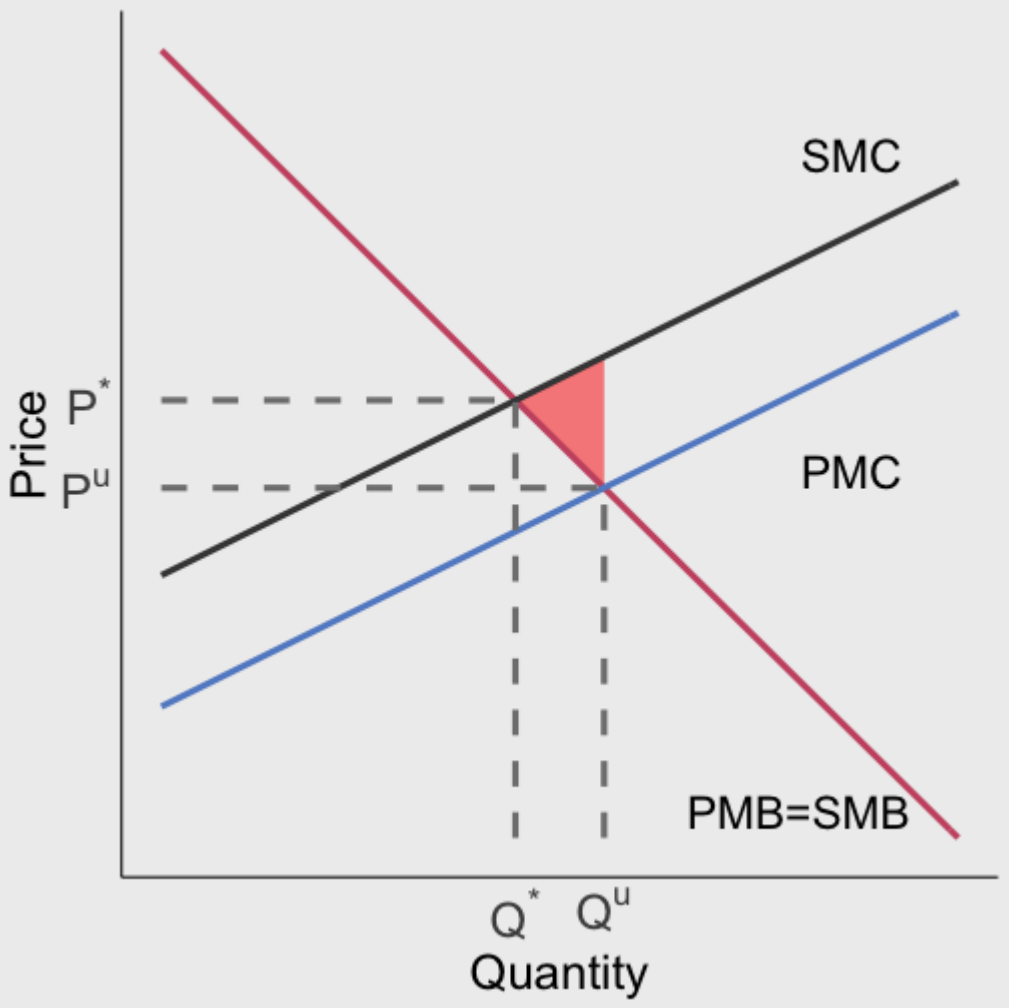
What's the social cost of this market failure?

Negative externalities: graphical



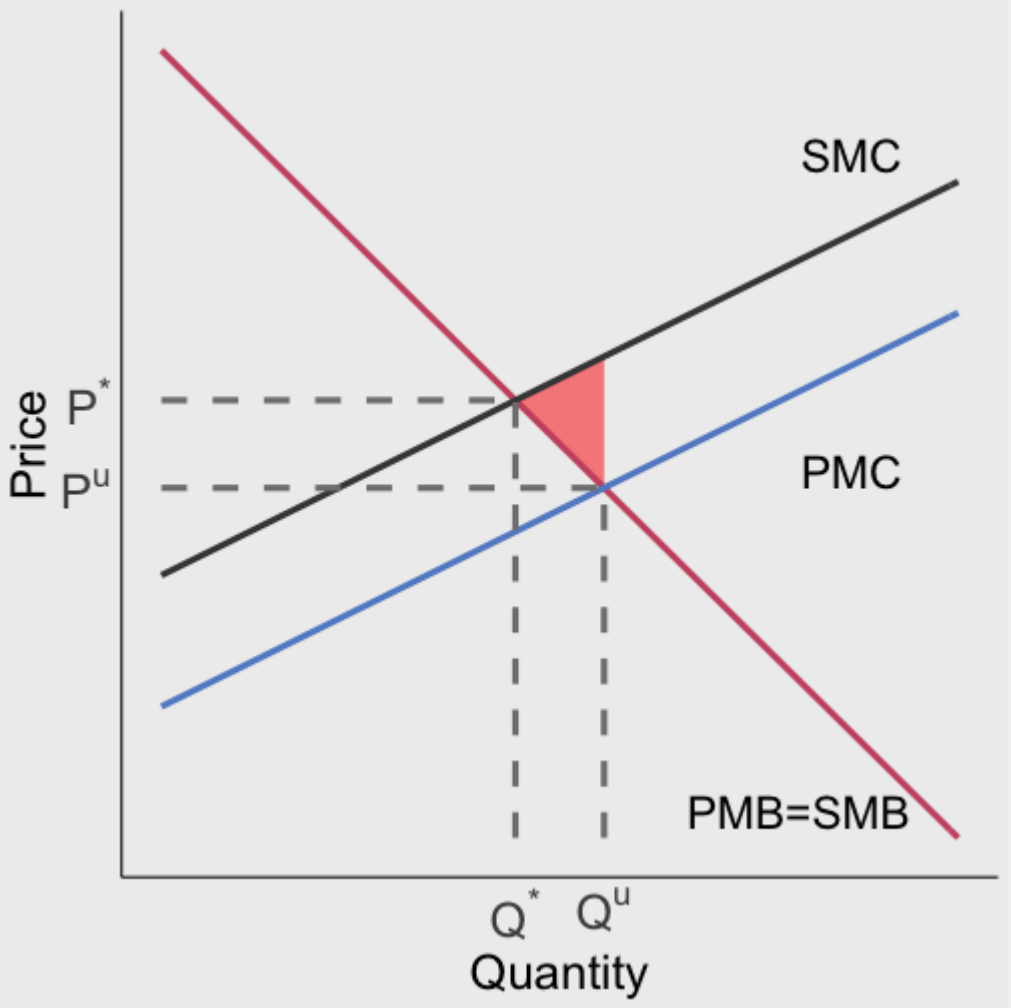
Negative externalities generate deadweight loss equal to...

Negative externalities: graphical



Negative externalities generate deadweight loss equal to the **red** area

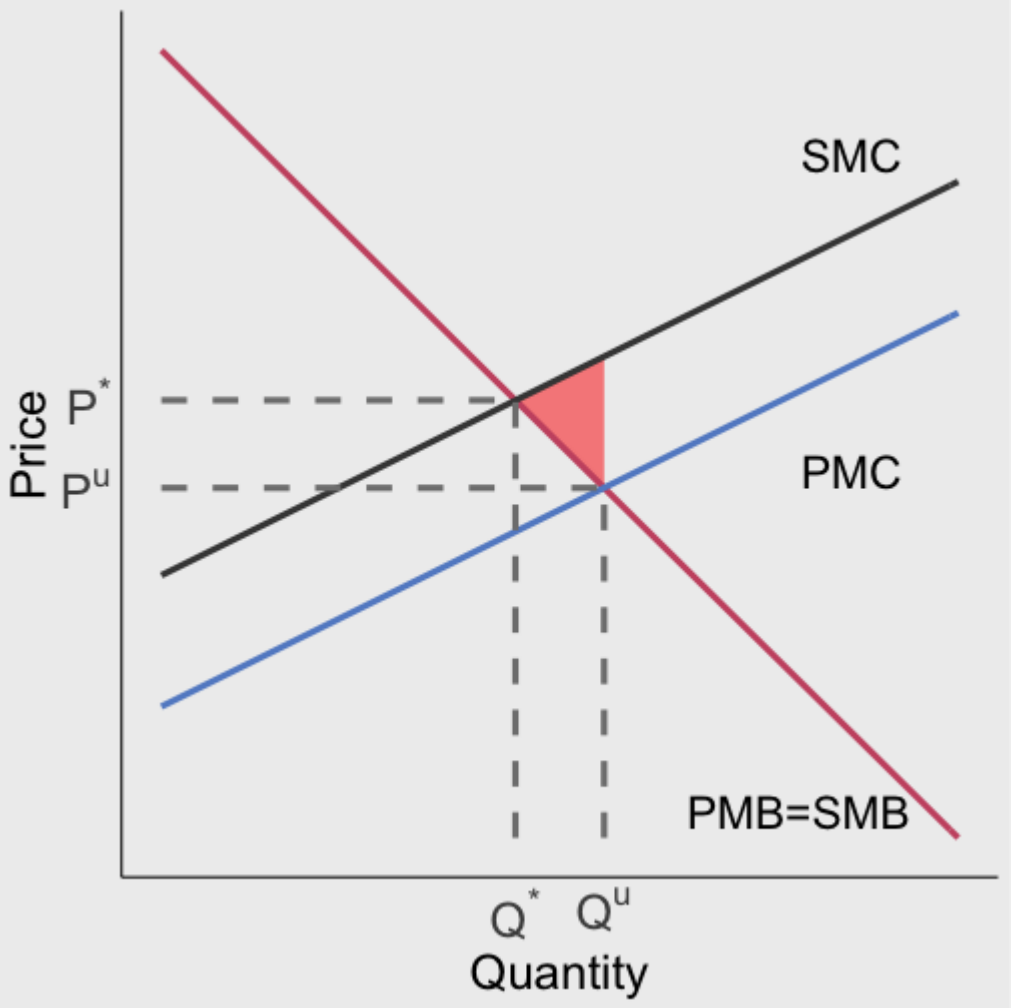
Negative externalities: graphical



Negative externalities generate deadweight loss equal to the **red** area

This is the difference in SMC and SMB for units bought/sold where SMC > SMB

Negative externalities: graphical

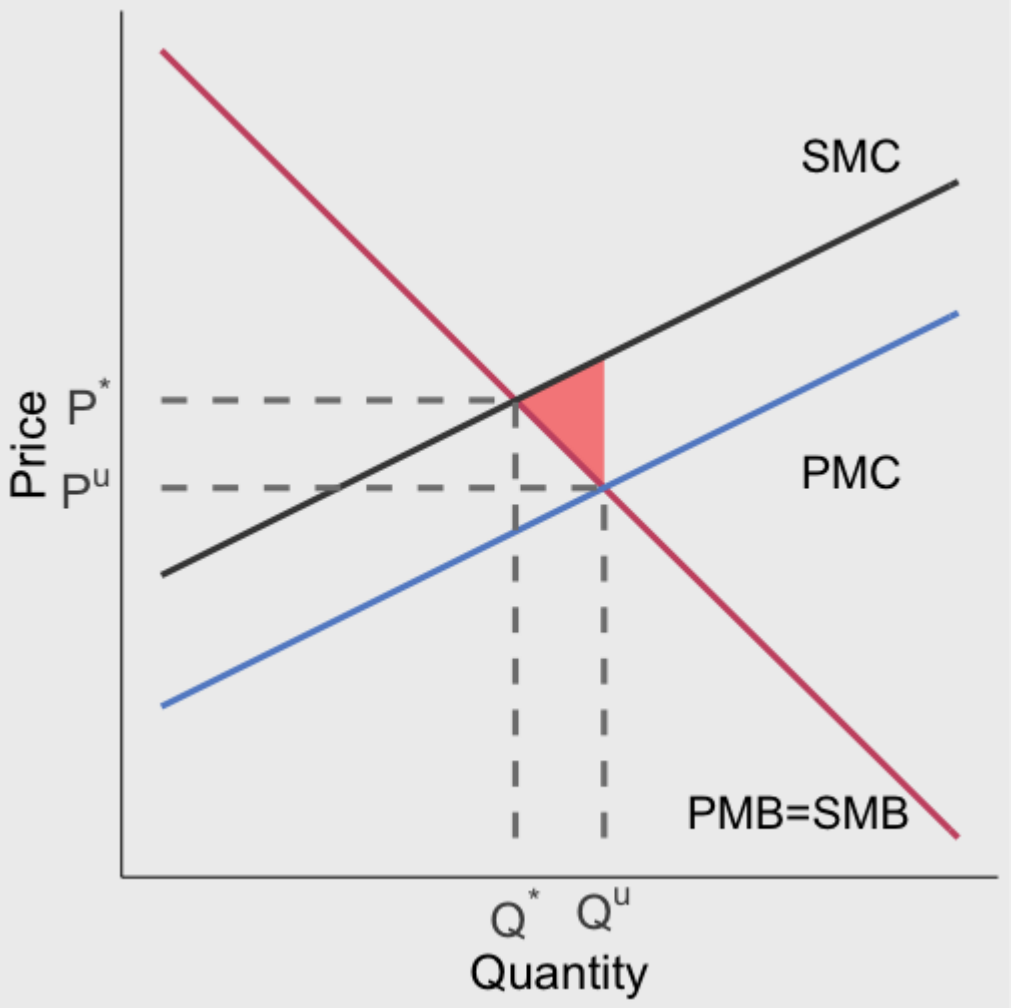


Negative externalities generate deadweight loss equal to the **red** area

This is the difference in SMC and SMB for units bought/sold where SMC > SMB

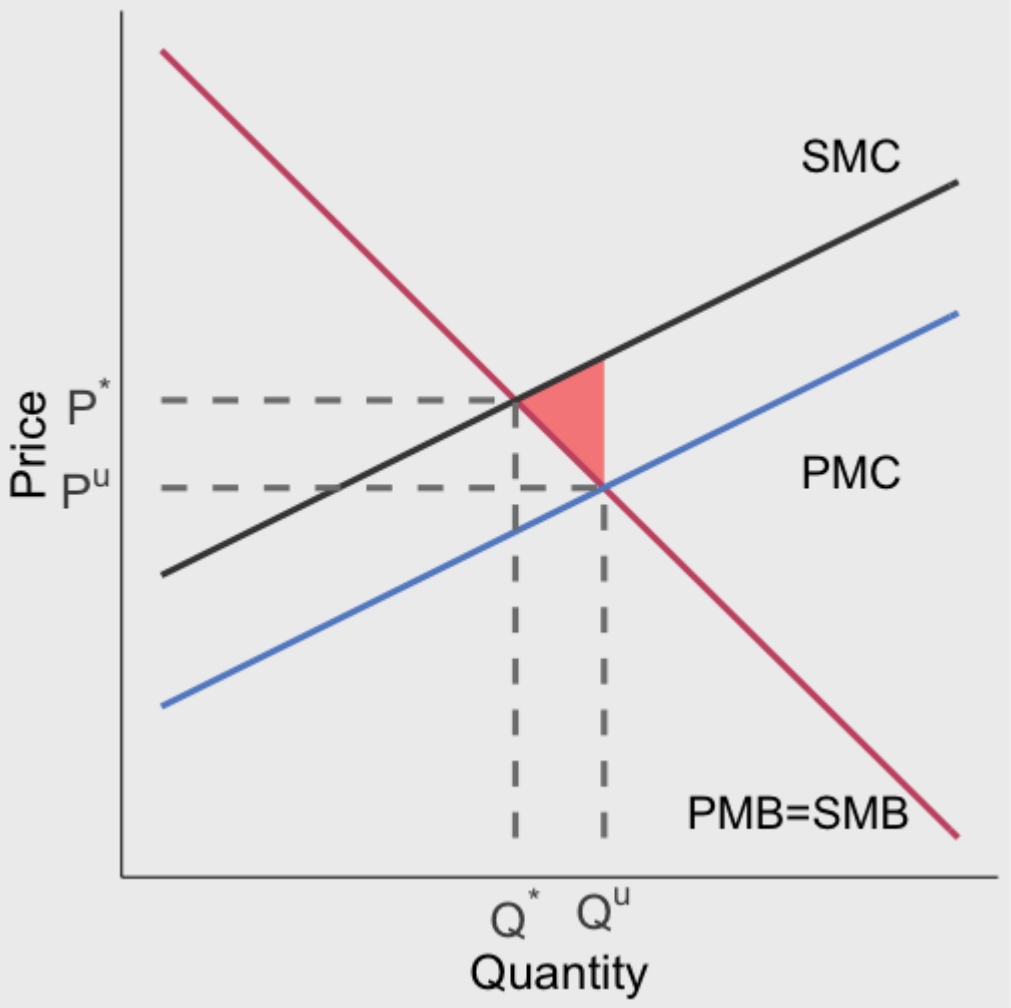
This is the loss to society caused by the externality in the unregulated private market

Negative externalities: graphical



Key takeaway:

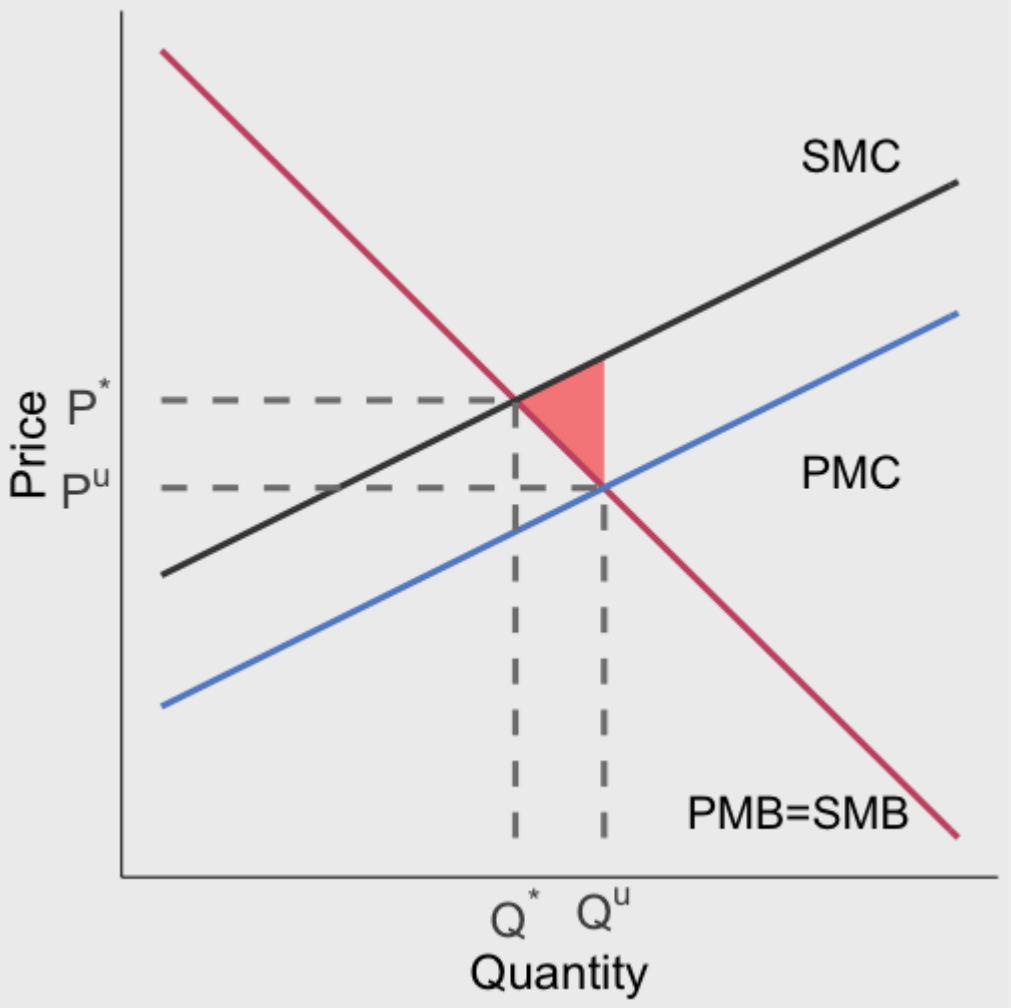
Negative externalities: graphical



Key takeaway:

The private market produces too much DDT

Negative externalities: graphical



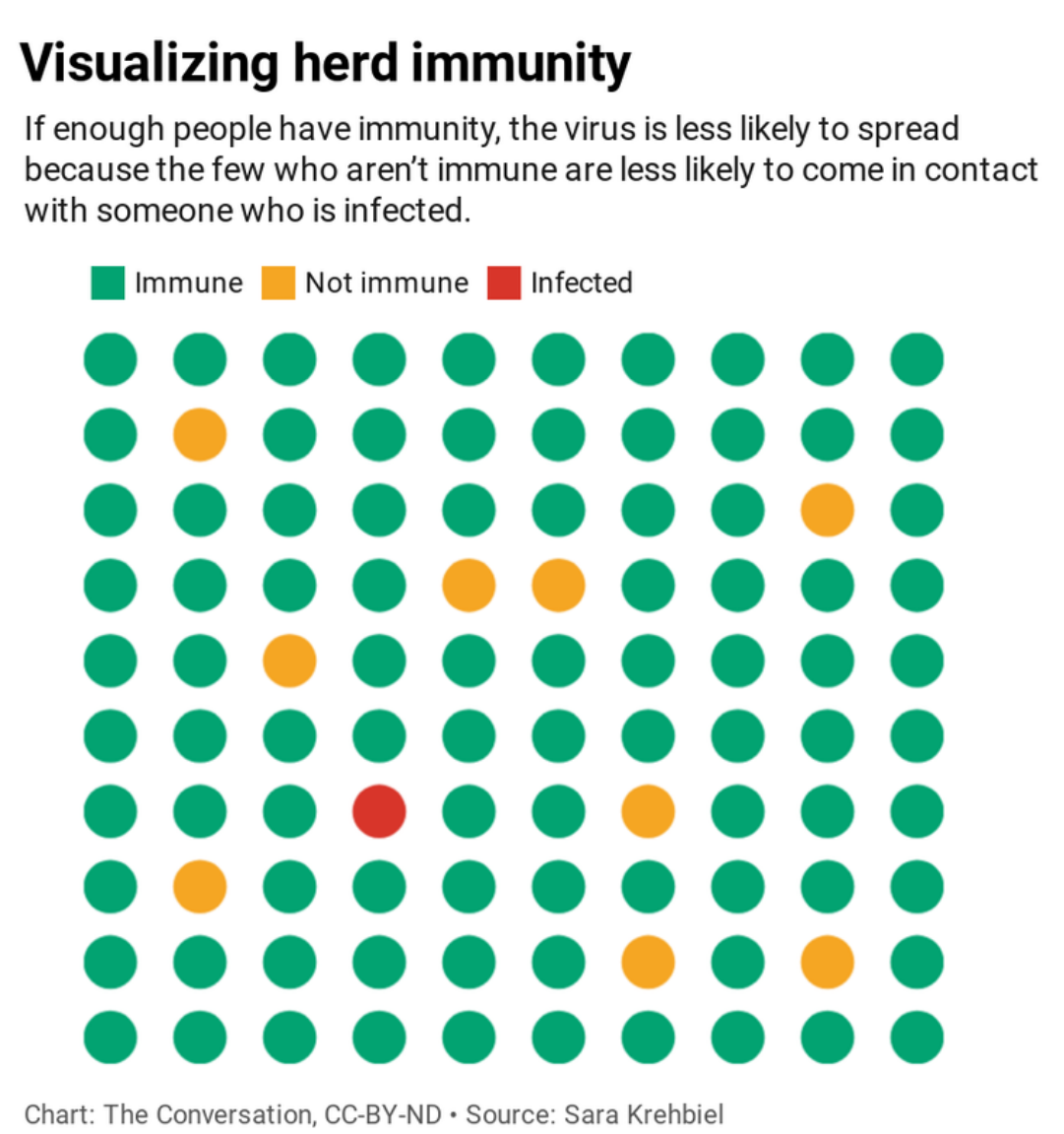
Key takeaway:

The private market produces too much DDT

The private actors are not accounting for the external costs they are imposing on people who are not in the DDT transaction (e.g. third parties whose health is being affected)

The birth of the environmental movement

Positive externalities

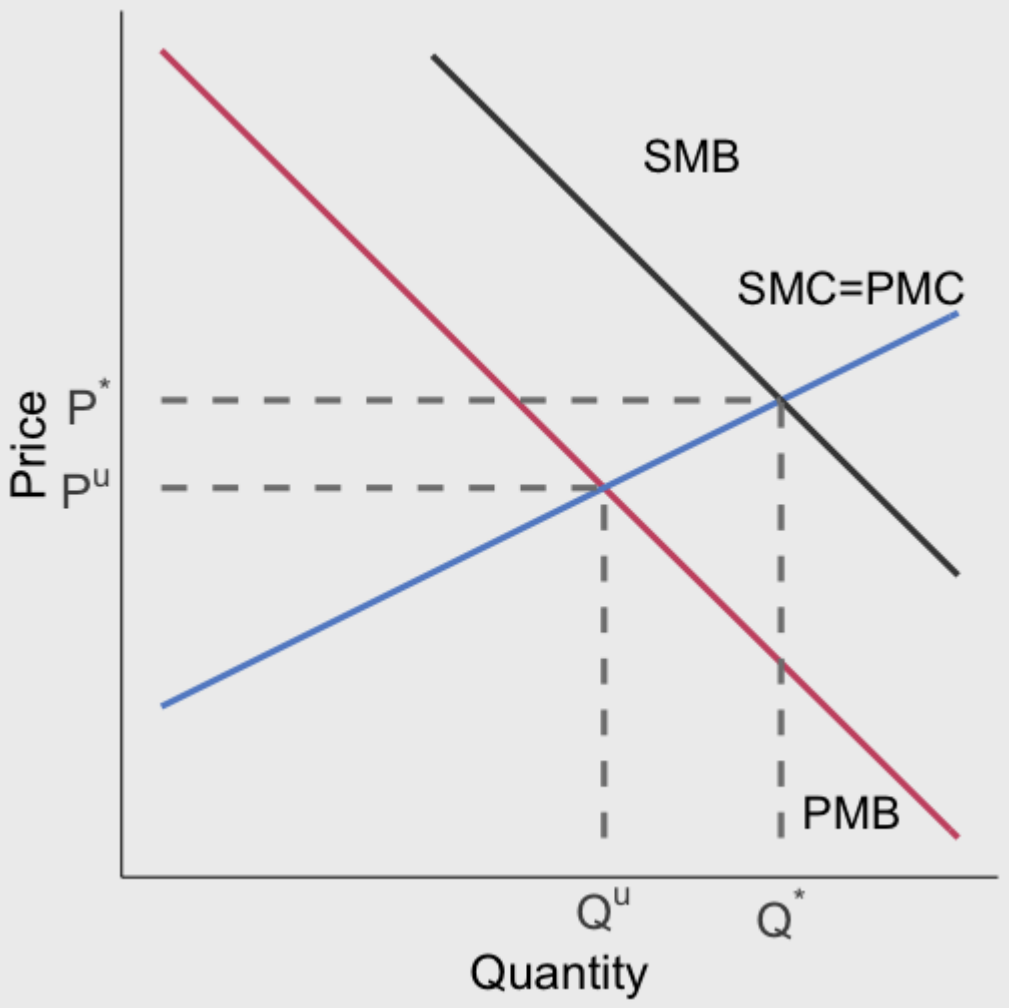


Positive externalities

Vaccines and masks are examples of good with positive externalities

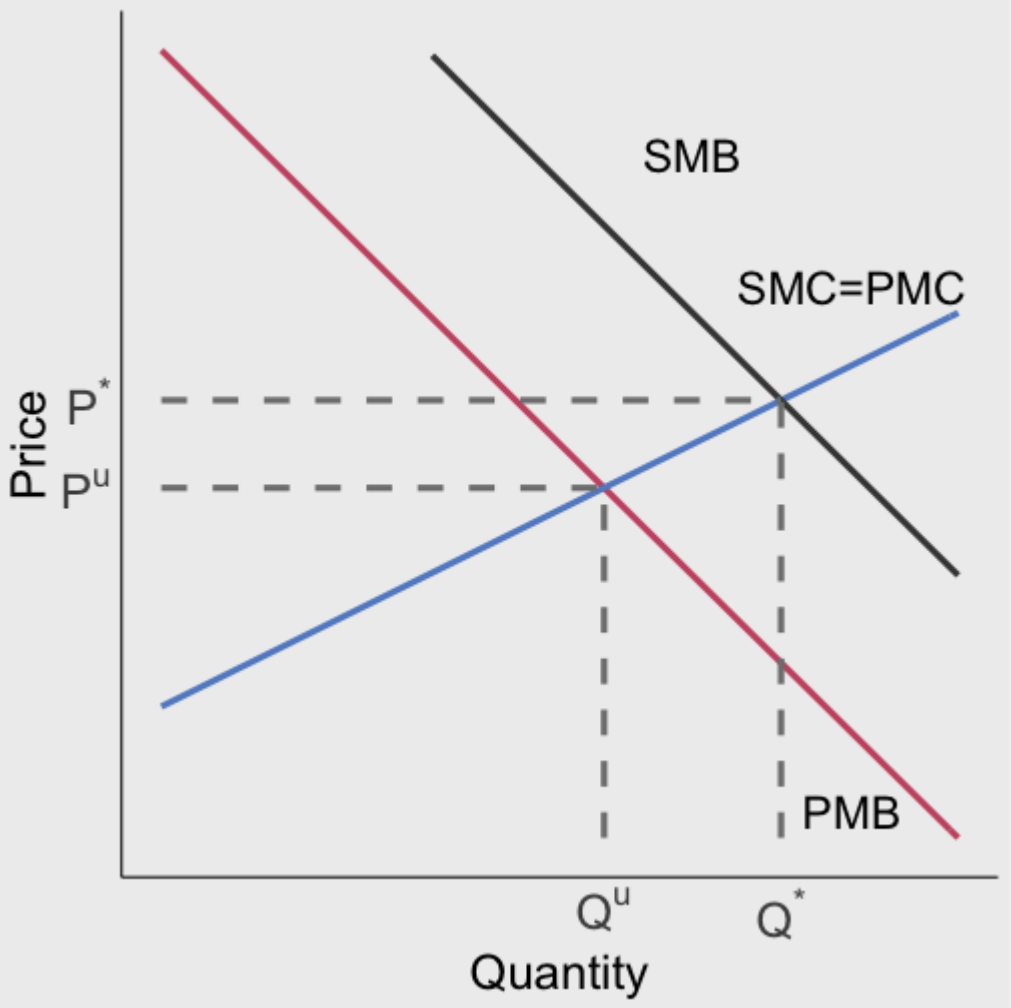
You getting or using them has benefits for other people not involved in your vaccine or mask transaction

Positive externalities: graphical



Social marginal benefit (SMB) is the sum of private marginal benefit (PMB) and the external marginal benefit (EMB)

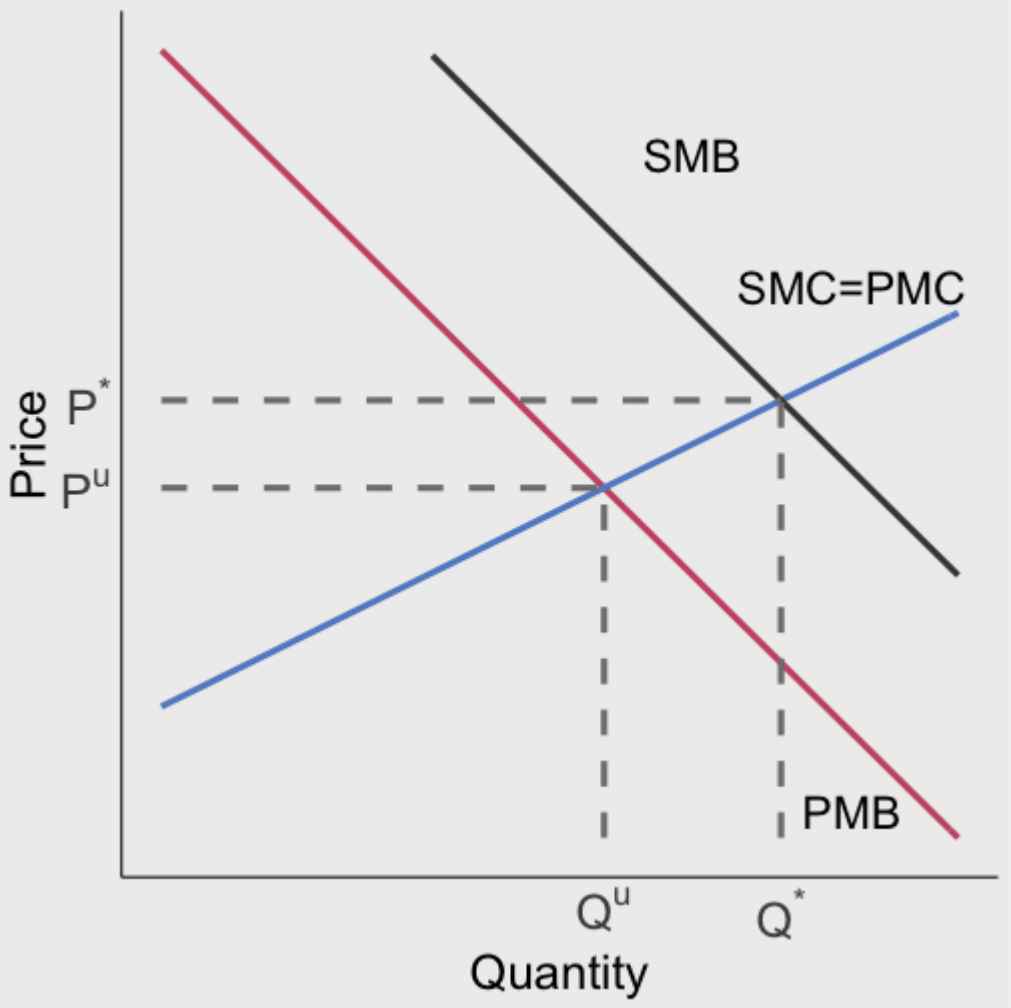
Positive externalities: graphical



Social marginal benefit (SMB) is the sum of private marginal benefit (PMB) and the external marginal benefit (EMB)

The PMB curve only reflects the **private benefits** of getting a vaccine

Positive externalities: graphical

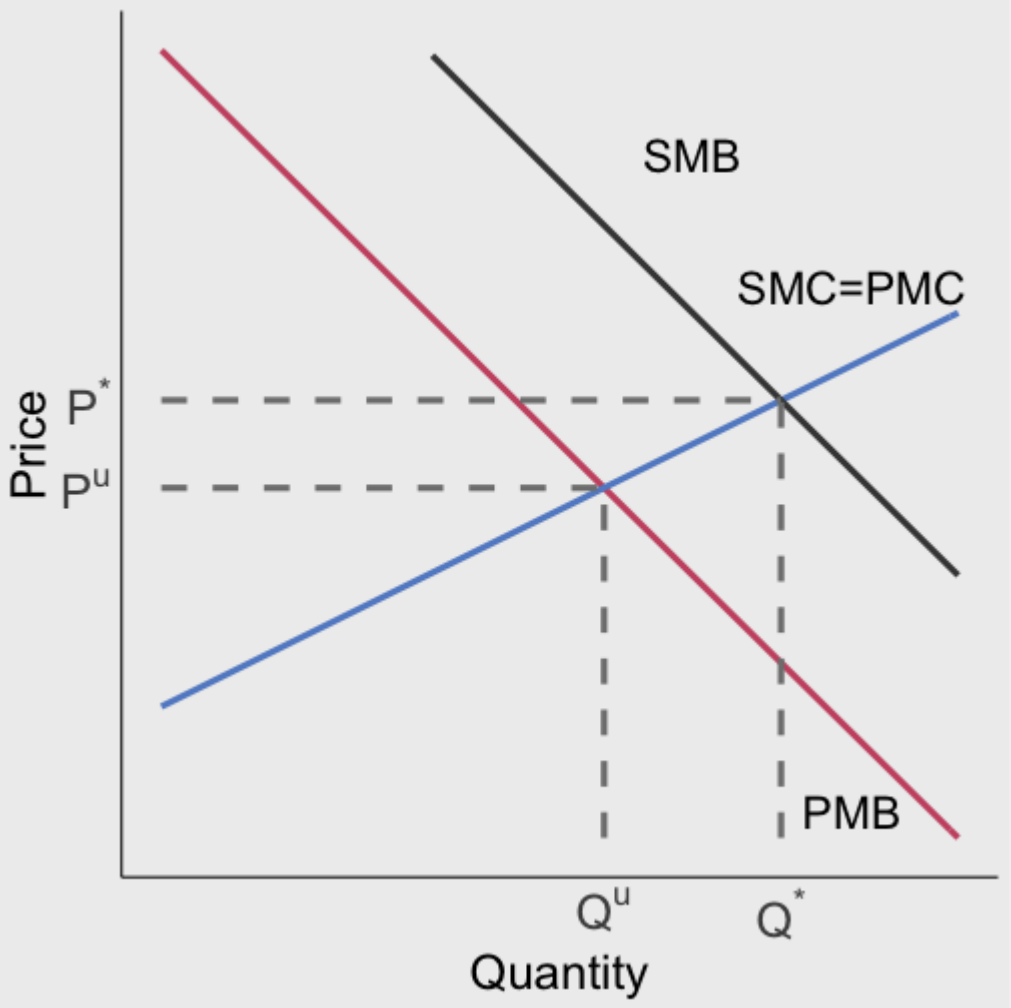


Social marginal benefit (SMB) is the sum of private marginal benefit (PMB) and the external marginal benefit (EMB)

The PMB curve only reflects the **private benefits** of getting a vaccine

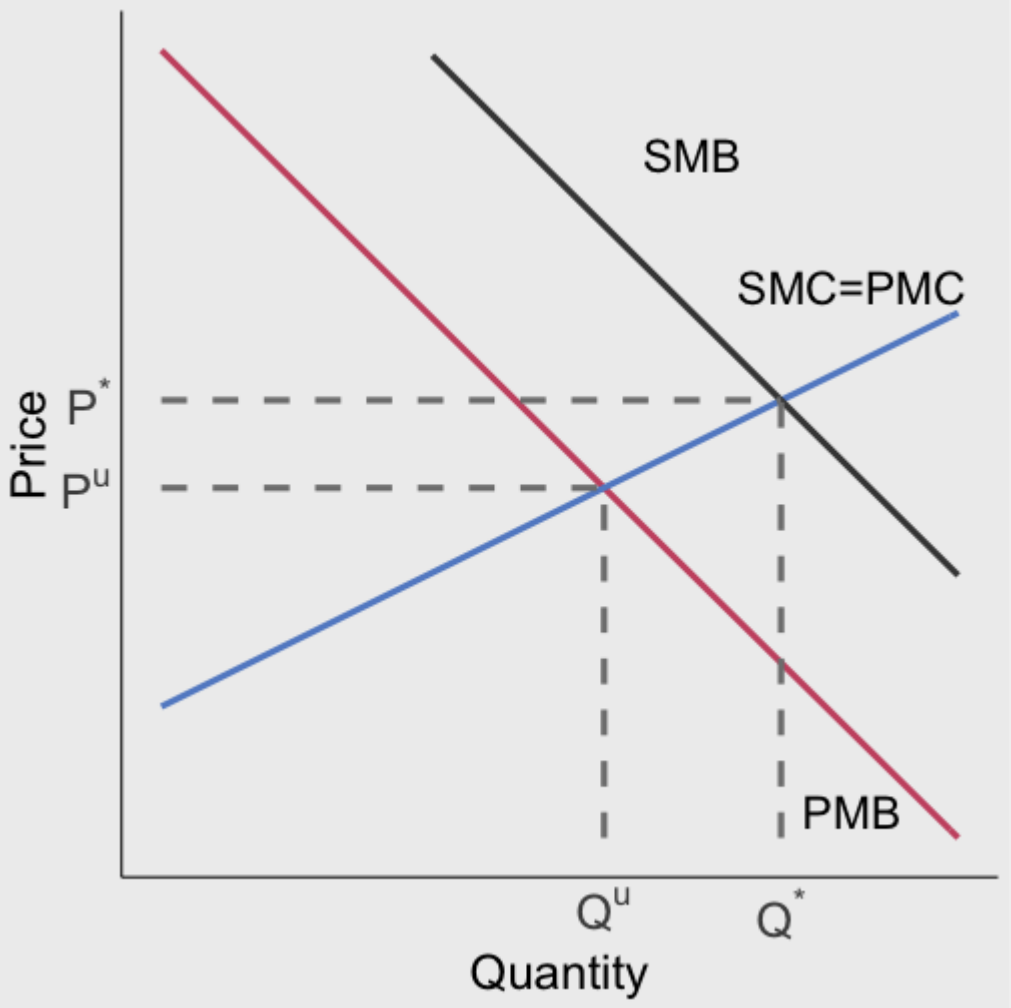
It does not account for the external herd immunity benefits

Positive externalities: graphical



Adding the private and external marginal benefits together gives us the SMB, what we care about from the social planner or regulator's perspective

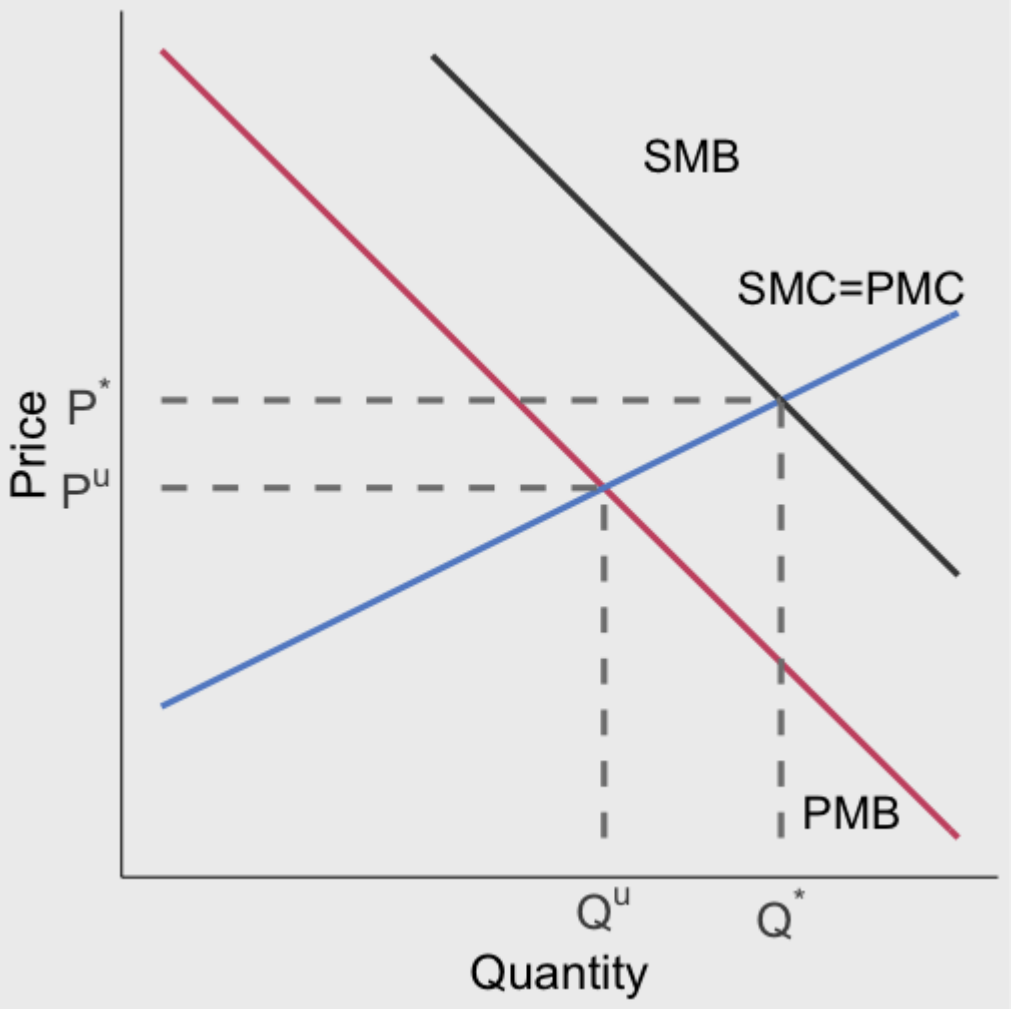
Positive externalities: graphical



Adding the private and external marginal benefits together gives us the SMB, what we care about from the social planner or regulator's perspective

The unregulated market gives us (P^u, Q^u) as an outcome when we want (P^*, Q^*)

Positive externalities: graphical

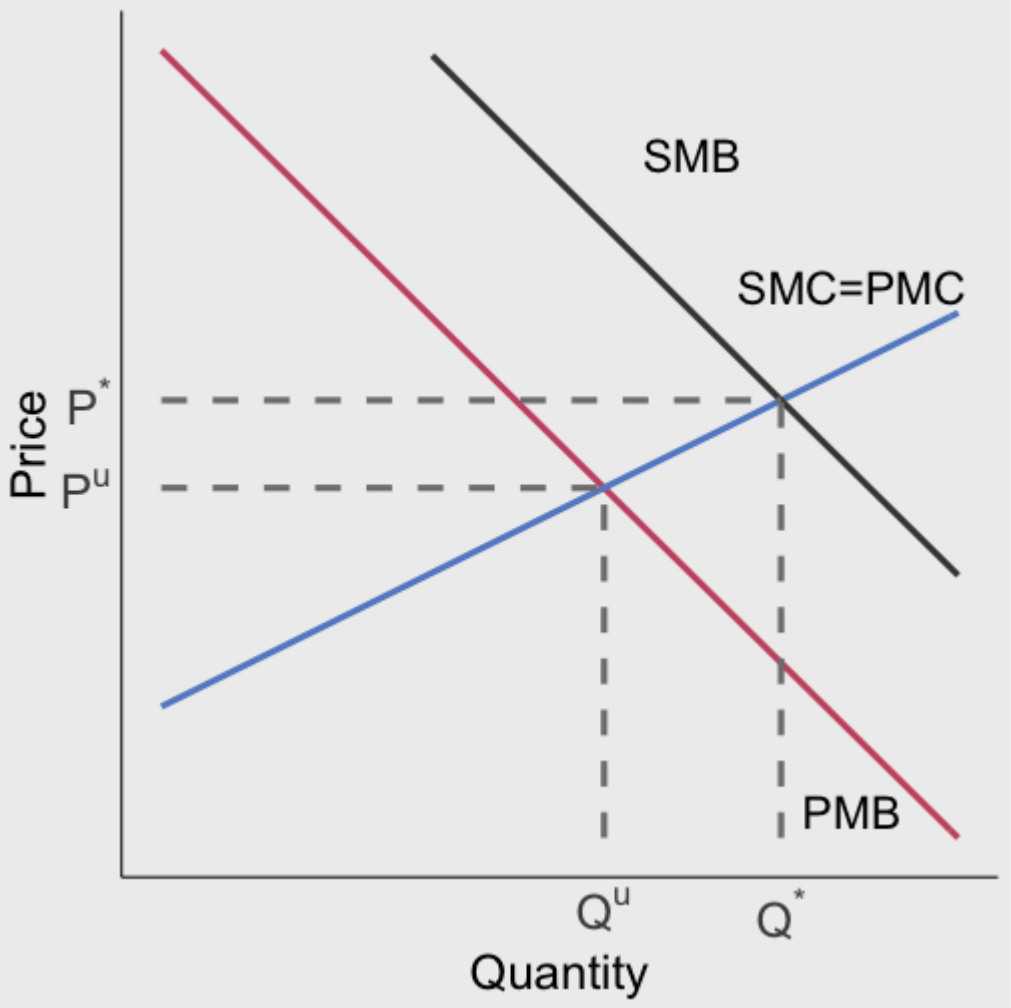


Adding the private and external marginal benefits together gives us the SMB, what we care about from the social planner or regulator's perspective

The unregulated market gives us (P^u, Q^u) as an outcome when we want (P^*, Q^*)

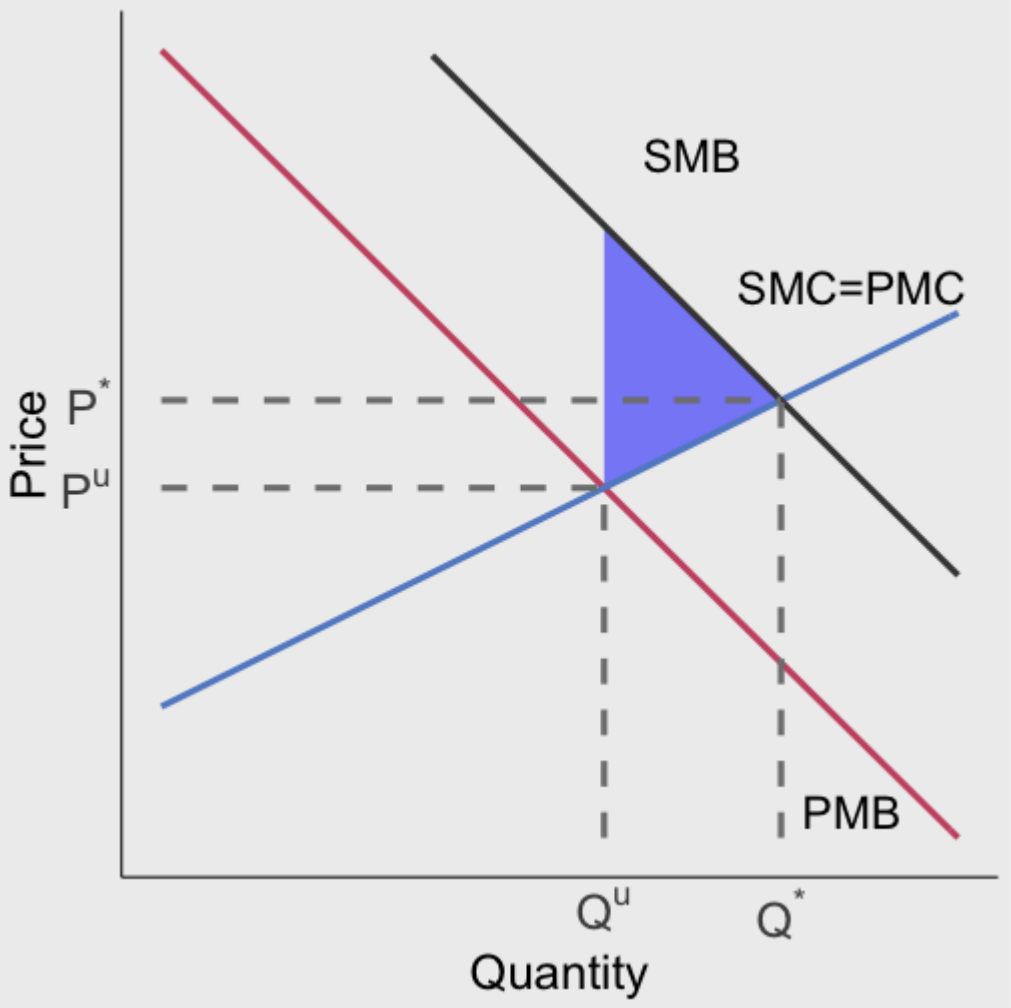
What's the social cost of this market failure?

Positive externalities: graphical



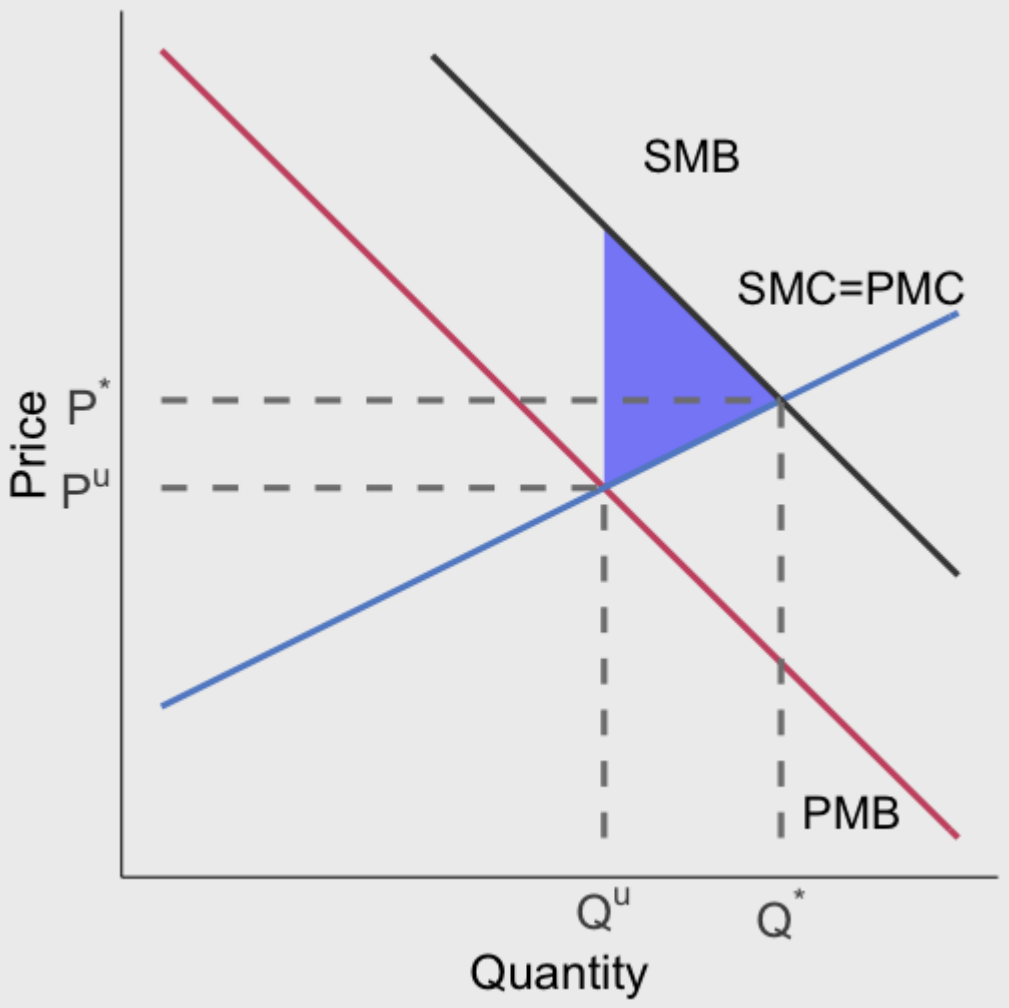
Positive externalities generate deadweight loss equal to...

Positive externalities: graphical



Positive externalities generate deadweight loss equal to the **blue** area

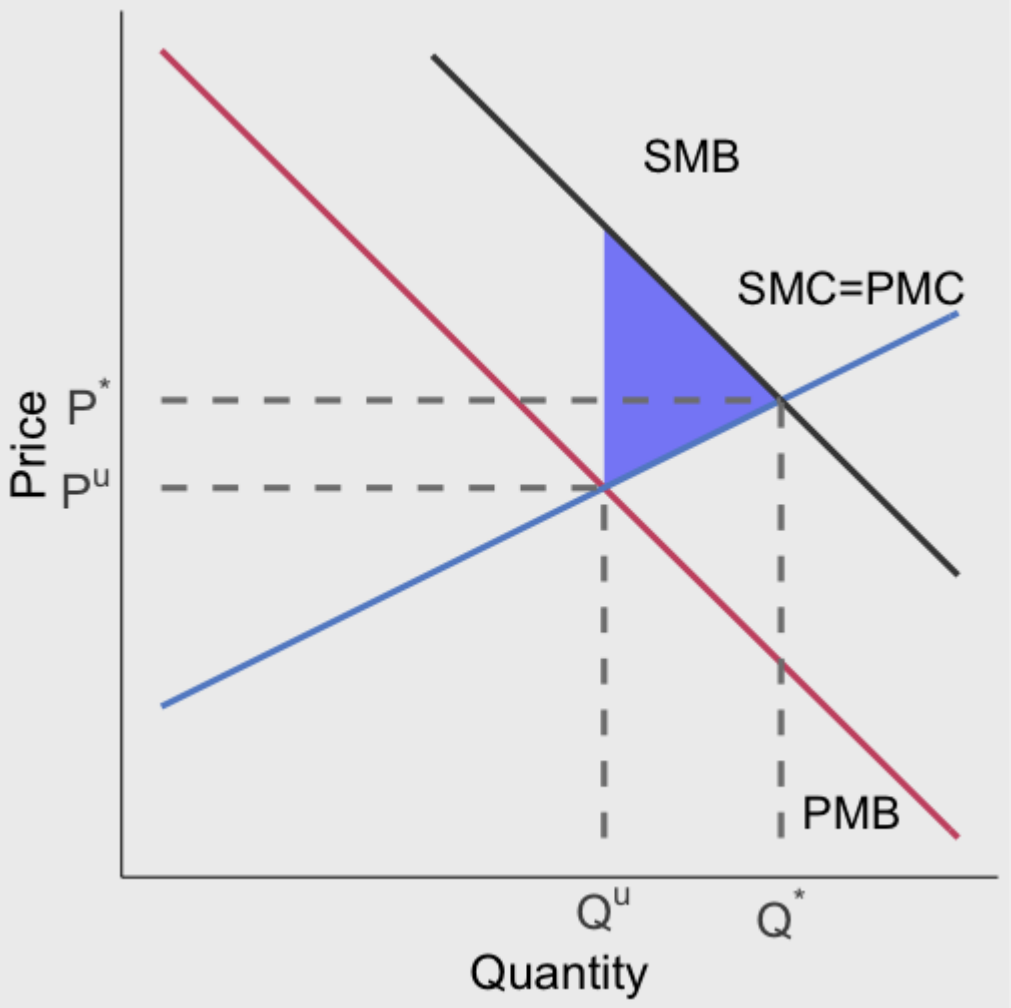
Positive externalities: graphical



Positive externalities generate deadweight loss equal to the **blue** area

This is the difference in SMB and SMC for units where SMC < SMB

Positive externalities: graphical

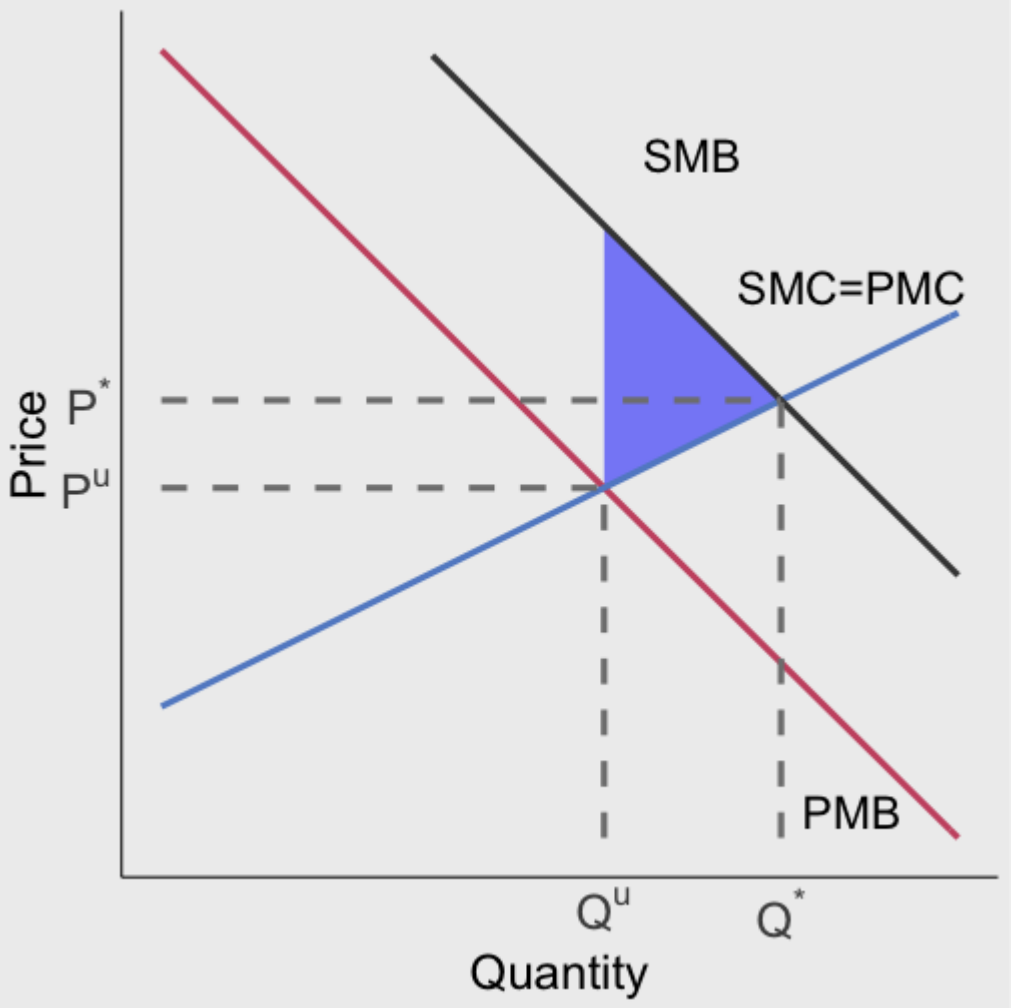


Positive externalities generate deadweight loss equal to the **blue** area

This is the difference in SMB and SMC for units where SMC < SMB

This is the loss to society caused by the externality in the unregulated private market

Positive externalities: graphical



The private market produces too few vaccines

The private actors are not accounting for the social benefits they are imposing on people who are not in the vaccine transaction (e.g. third parties whose health is being affected)

Why do externalities arise?

Typically one of two reasons:

Why do externalities arise?

Typically one of two reasons:

1. Poorly defined property rights
    - Who owns the right to the air?

Why do externalities arise?

Typically one of two reasons:

1. Poorly defined property rights
    - Who owns the right to the air?
2. High transactions costs
    - Hard to bargain over desired air quality with millions of people

Lets conceptualize a model of efficient bargaining using an Edgeworth Box

Why do externalities arise? Edgeworth Box

- Two individuals: A and B
- Two private goods: X and Y

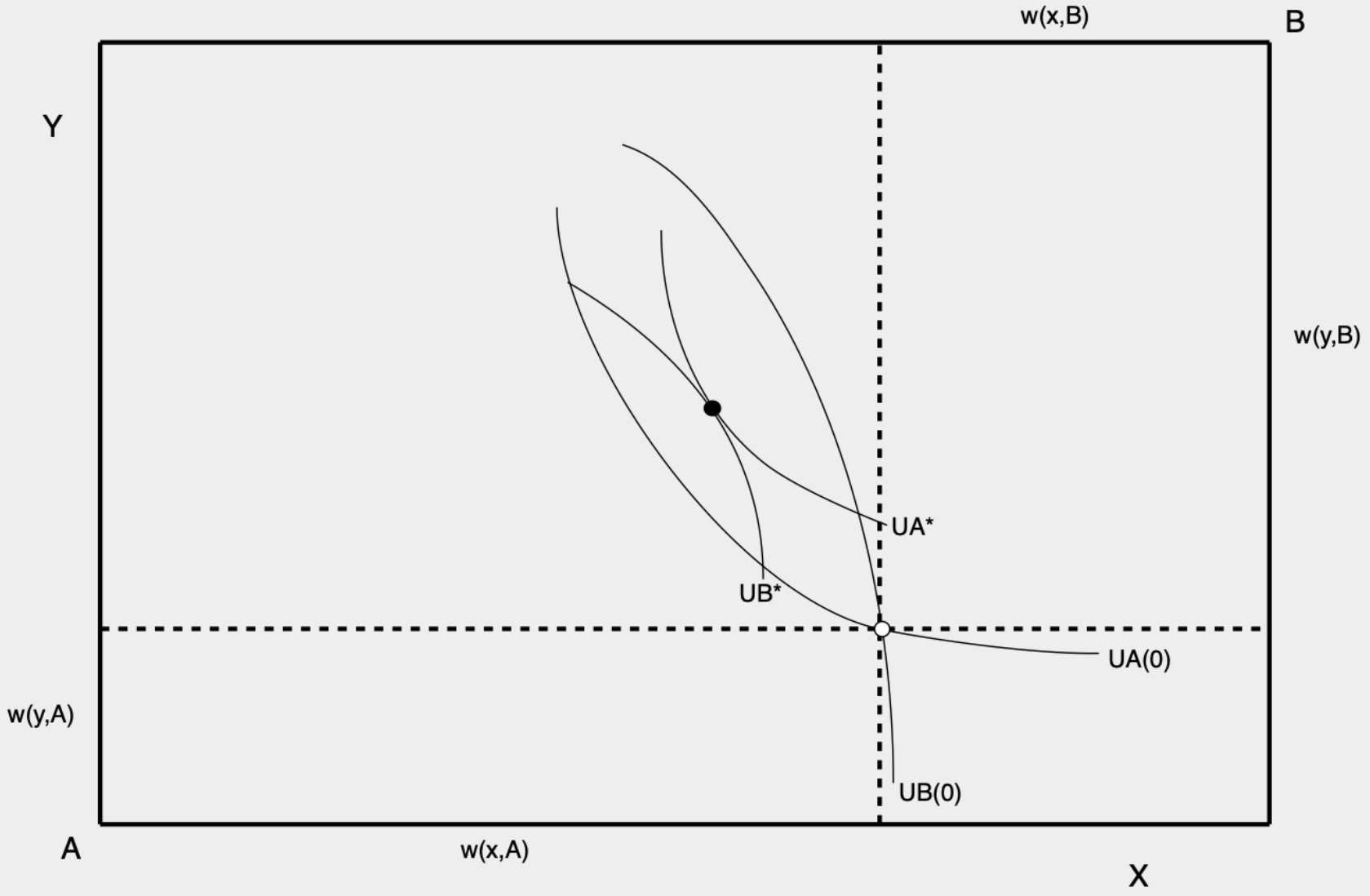
Each individual begins with an initial endowment of each good:

- $A : w_X^A, w_Y^A$
- $B : w_X^B, w_Y^B$

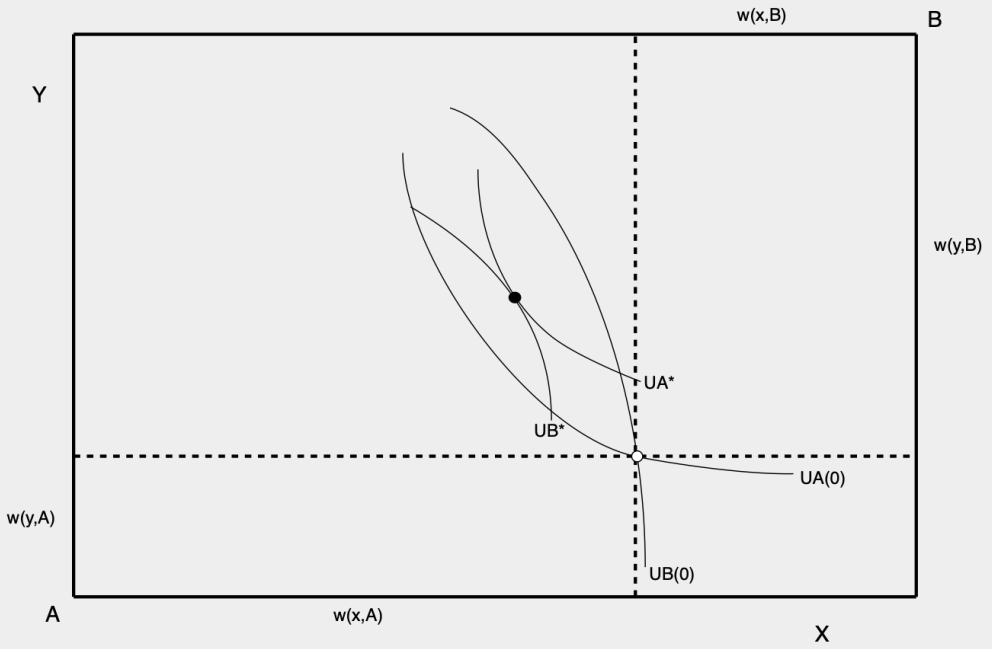
This gives us a total endowment:

- $W_X = w_X^A + w_X^B$
- $W_Y = w_Y^A + w_Y^B$

Why do externalities arise? Edgeworth Box



Why do externalities arise? Edgeworth Box



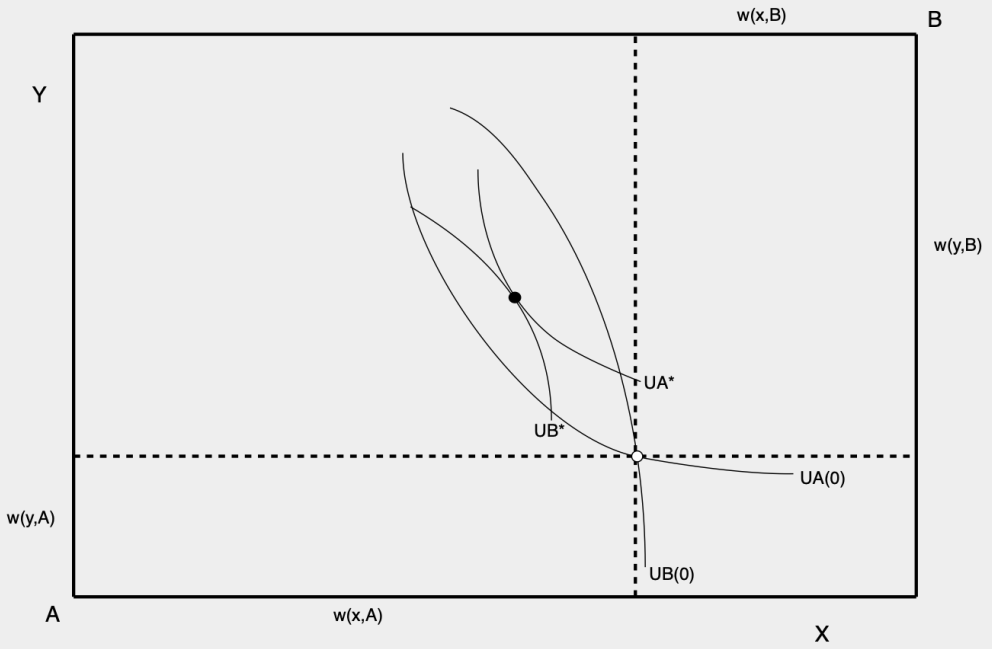
Total vertical distance is W_Y

Total horizontal distance is W_X

Initial endowment is given by the empty circle

Initial indifference curves for A and B are $UA(0)$ and $UB(0)$

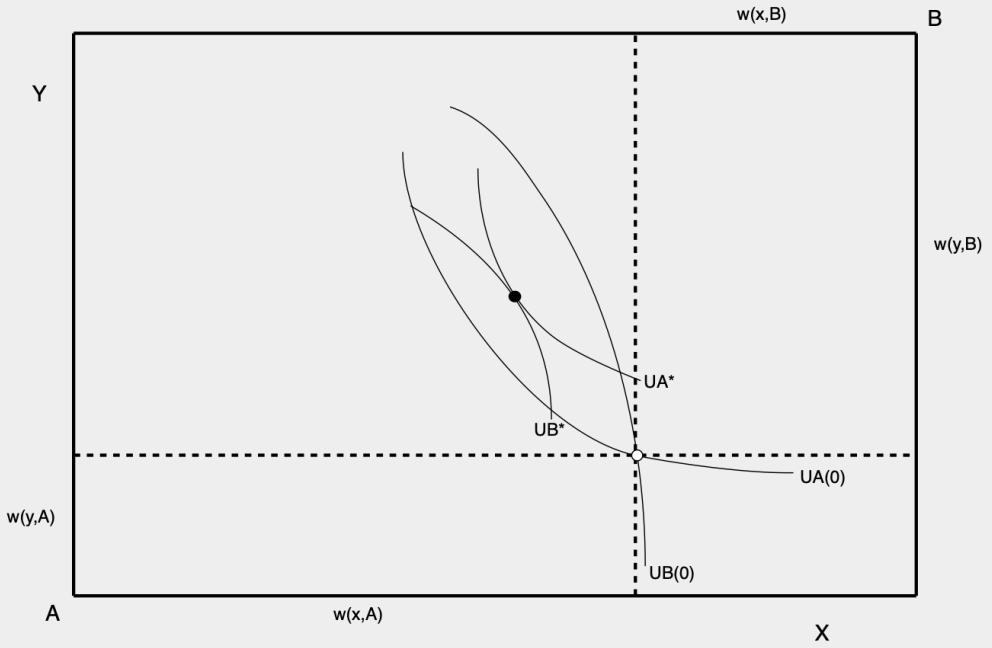
Why do externalities arise? Edgeworth Box



Is there a possible Pareto improvement?

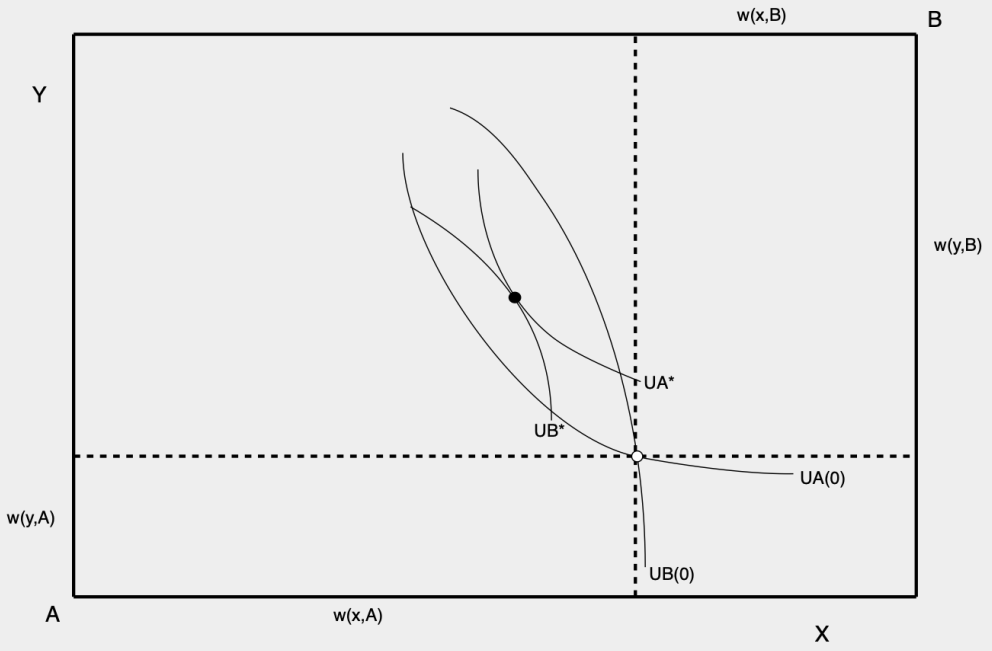
e.g. can we make both A and B better off?

Why do externalities arise? Edgeworth Box



Yes!

Why do externalities arise? Edgeworth Box



Yes!

If we move anywhere in the lens of their initial indifference curves we have a Pareto improvement

If we move to an allocation where their indifference curves are tangent to one another (e.g. the filled-in point), we have a Pareto optimum

Why do externalities arise? Edgeworth Box

In a properly functioning market:

- The endowment point is well-established

Why do externalities arise? Edgeworth Box

In a properly functioning market:

- The endowment point is well-established
- A and B can trade X and Y to some Pareto improving point

Why do externalities arise? Edgeworth Box

In a properly functioning market:

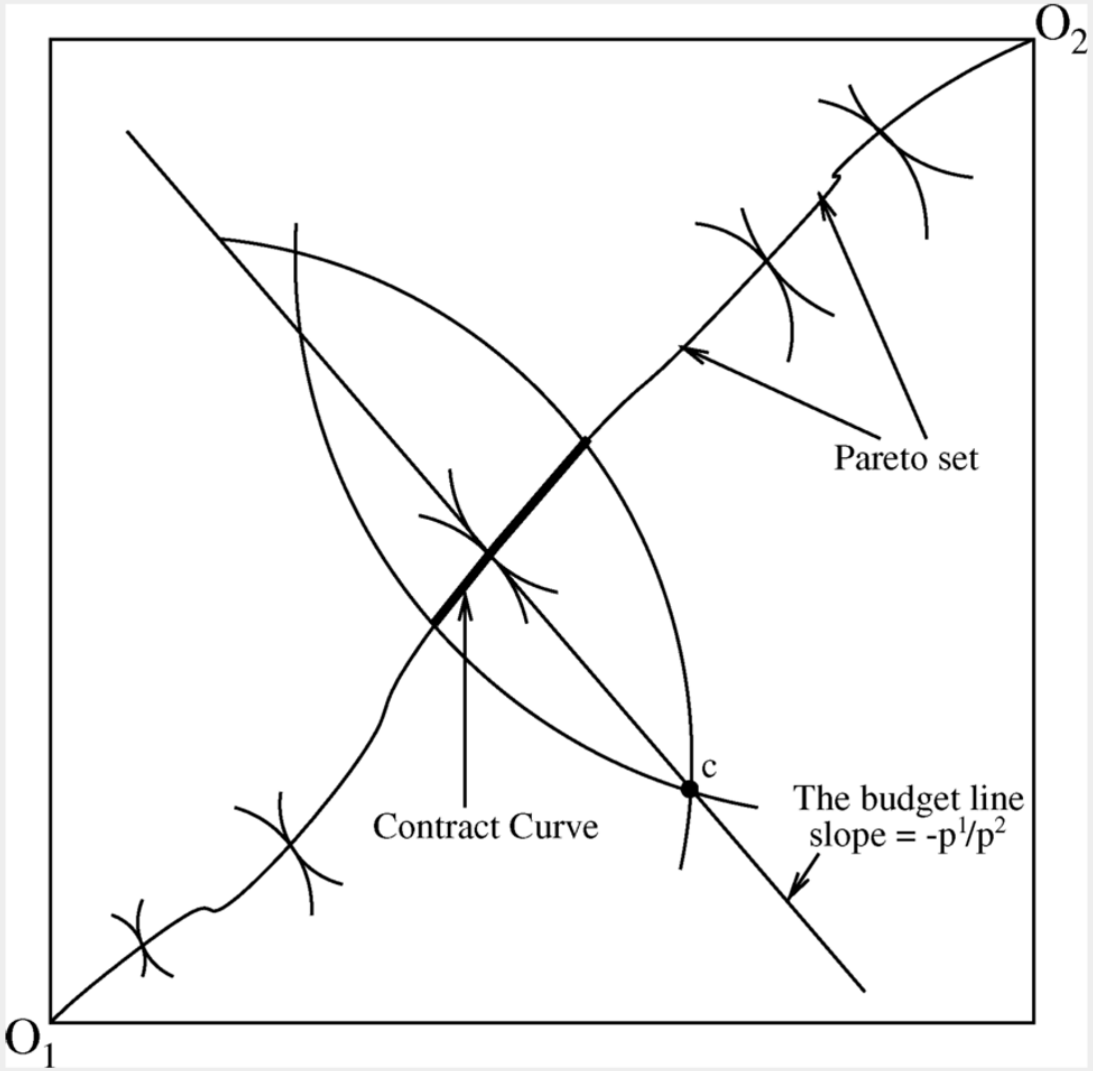
- The endowment point is well-established
- A and B can trade X and Y to some Pareto improving point
- They continue trading until they achieve a Pareto optimal allocation

Why do externalities arise? Edgeworth Box

In a properly functioning market:

- The endowment point is well-established
- A and B can trade X and Y to some Pareto improving point
- They continue trading until they achieve a Pareto optimal allocation
- This allocation lies on the contract curve: the line consisting of all Pareto efficient allocations

Why do externalities arise? Edgeworth Box



Why do externalities arise? Edgeworth Box

Now suppose Y is not a private good, but a public good/bad, e.g. smoke

Why do externalities arise? Edgeworth Box

Now suppose Y is not a private good, but a public good/bad, e.g. smoke

This means that A and B consume the exact same level of Y

Why do externalities arise? Edgeworth Box

Now suppose Y is not a private good, but a public good/bad, e.g. smoke

This means that A and B consume the exact same level of Y

Unlike our regular Edgeworth Box, now Y increases for both A and B as we move to the top of the slide (before Y increased for B as we moved to the bottom)

Why do externalities arise? Edgeworth Box

Now suppose Y is not a private good, but a public good/bad, e.g. smoke

This means that A and B consume the exact same level of Y

Unlike our regular Edgeworth Box, now Y increases for both A and B as we move to the top of the slide (before Y increased for B as we moved to the bottom)

Suppose that A likes Y, but B does not

Why do externalities arise? Edgeworth Box

Now suppose Y is not a private good, but a public good/bad, e.g. smoke

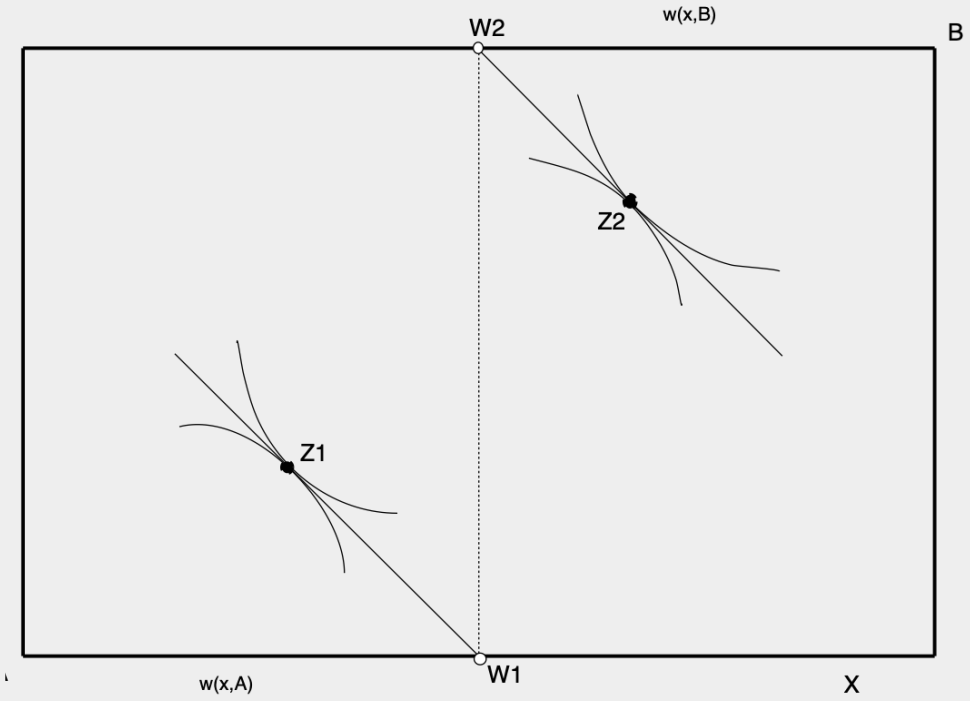
This means that A and B consume the exact same level of Y

Unlike our regular Edgeworth Box, now Y increases for both A and B as we move to the top of the slide (before Y increased for B as we moved to the bottom)

Suppose that A likes Y, but B does not

Suppose both start off with the same quantity of X

Why do externalities arise? Edgeworth Box

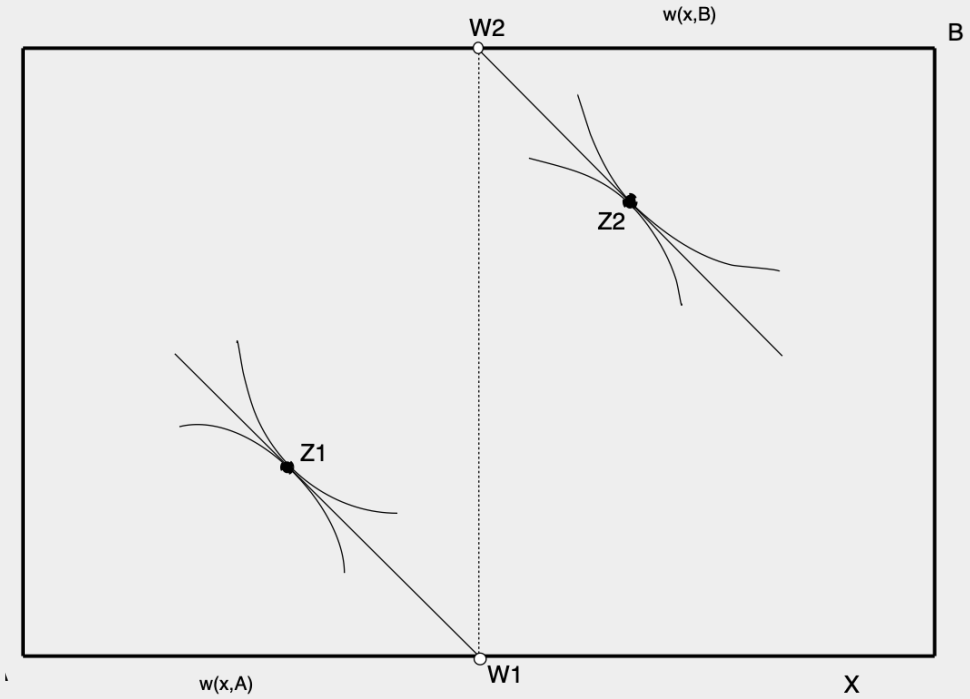


Depending on who has property rights, we either start at:

- W1 (B has property rights)
- W2 (A has property rights)

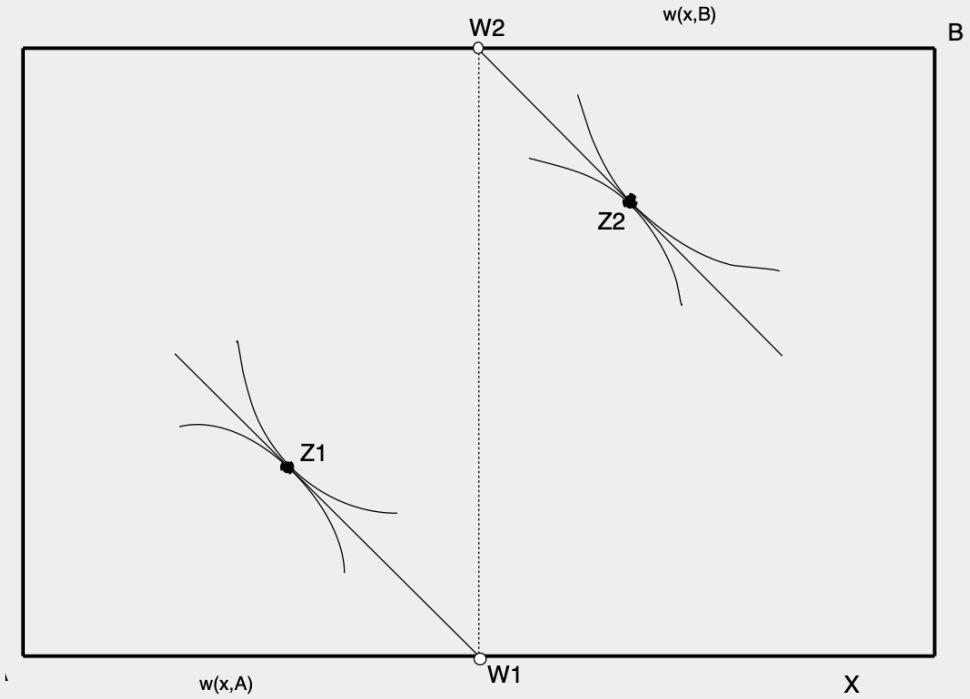
Think about why these are where we must start

Why do externalities arise? Edgeworth Box



Suppose we start at W1, what happens?

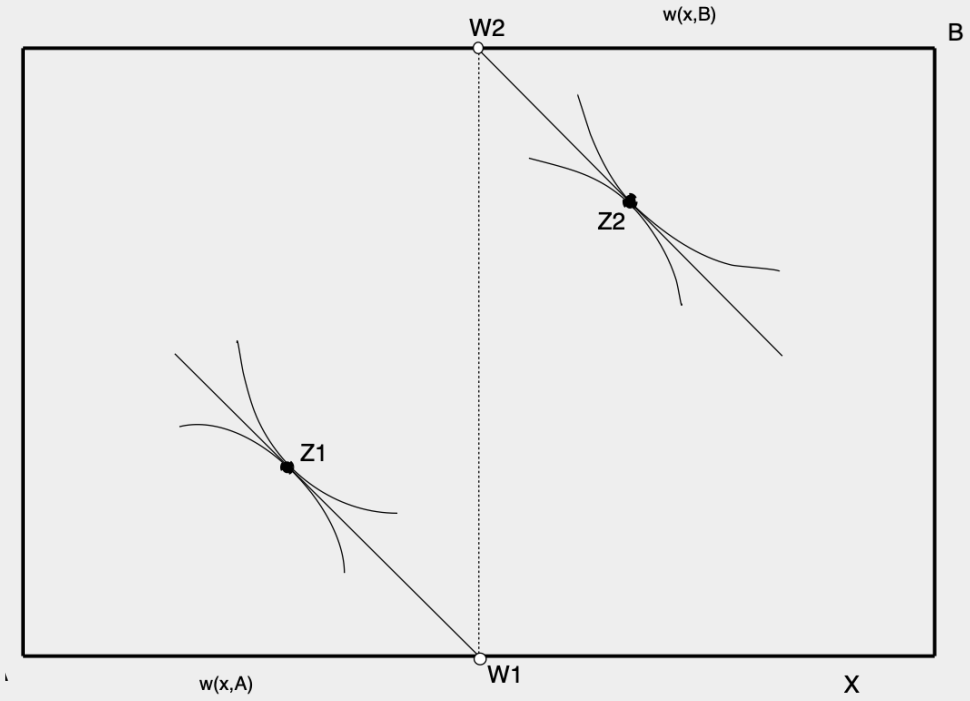
Why do externalities arise? Edgeworth Box



Suppose we start at W1, what happens?

A wants to have more Y, but this imposes a cost on B

Why do externalities arise? Edgeworth Box

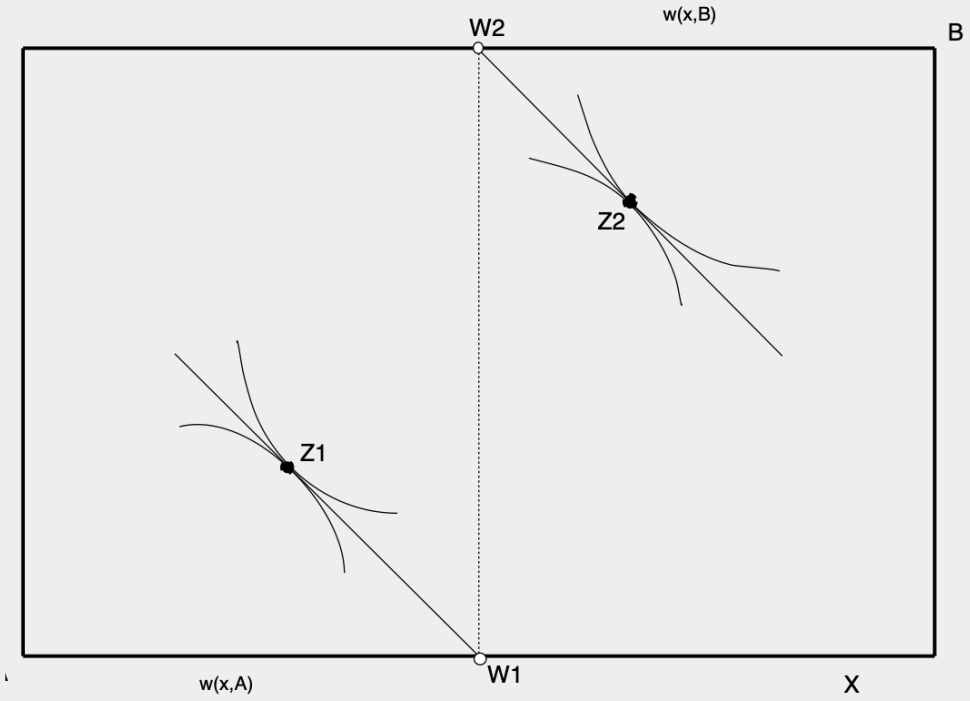


Suppose we start at W1, what happens?

A wants to have more Y, but this imposes a cost on B

Therefore, A has to pay B to get more Y

Why do externalities arise? Edgeworth Box



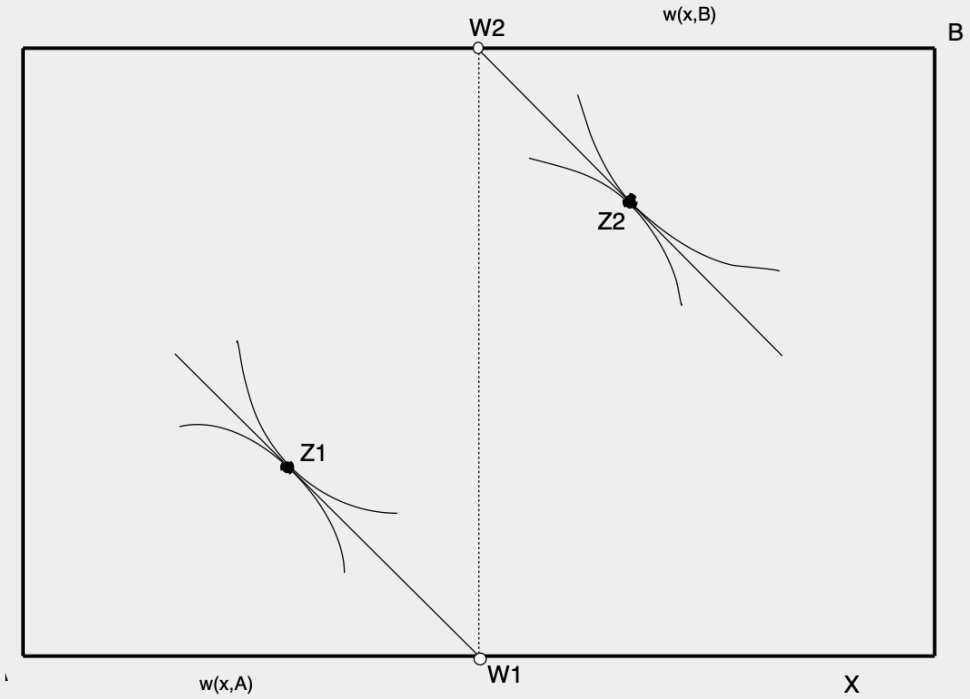
Suppose we start at W1, what happens?

A wants to have more Y, but this imposes a cost on B

Therefore, A has to pay B to get more Y

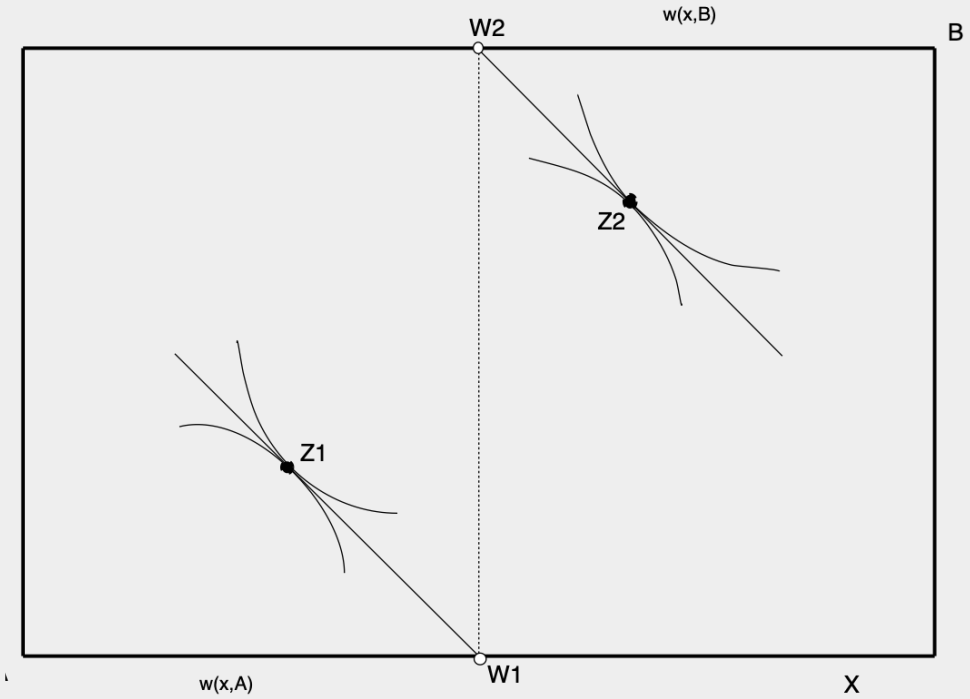
A pays B in units of X, move to Z1, Pareto optimum

Why do externalities arise? Edgeworth Box



Suppose we start at W2, what happens?

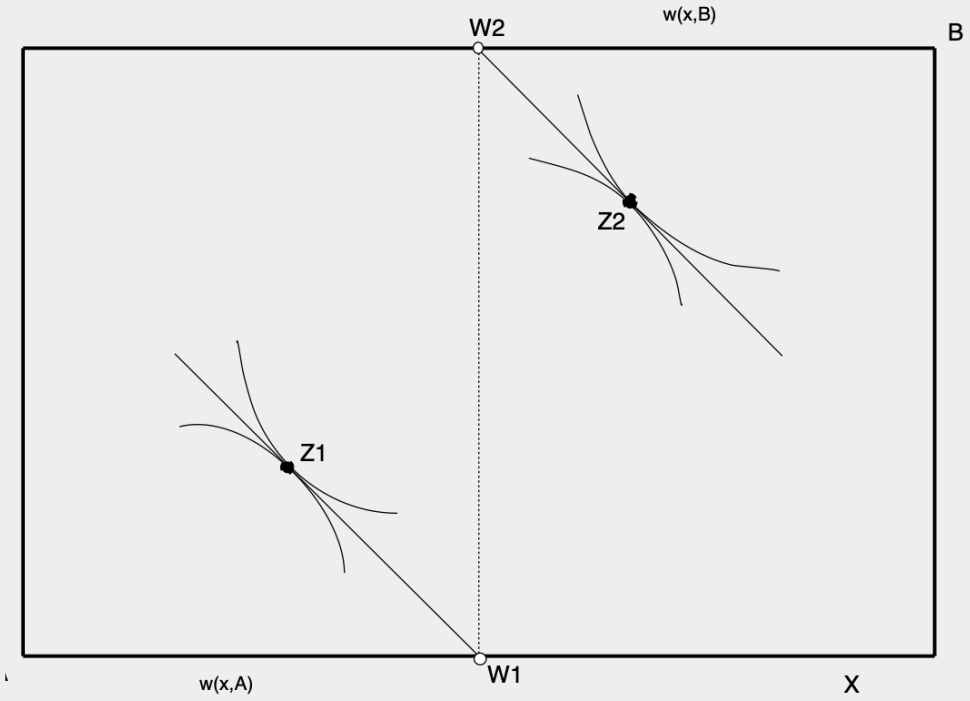
Why do externalities arise? Edgeworth Box



Suppose we start at W2, what happens?

B wants to have less Y, but this imposes a cost on A

Why do externalities arise? Edgeworth Box

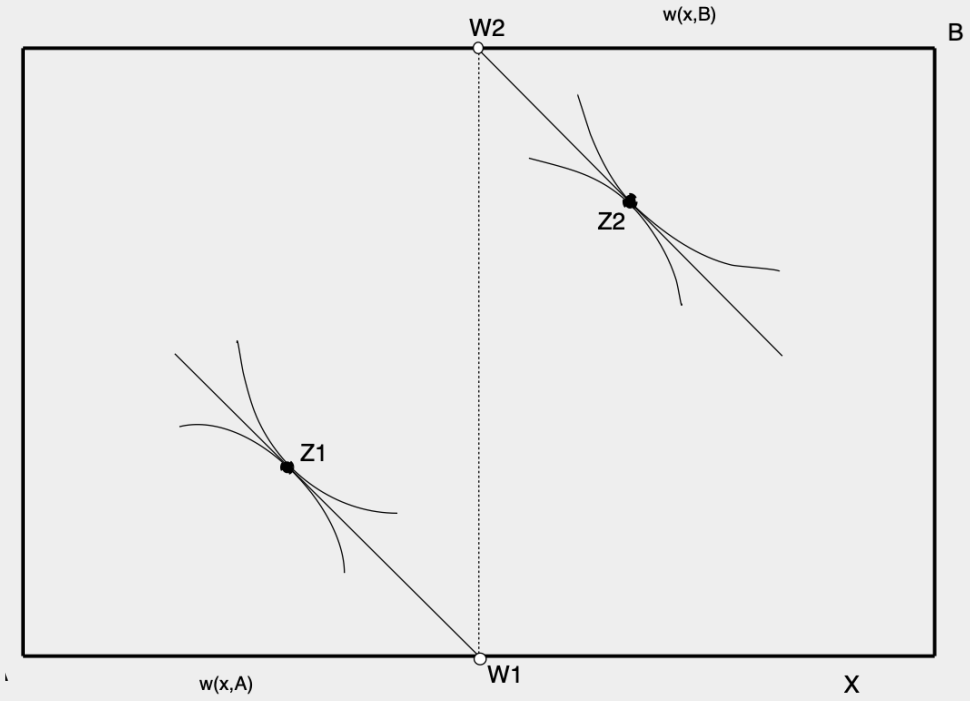


Suppose we start at W2, what happens?

B wants to have less Y, but this imposes a cost on A

Therefore, B has to pay A to get less Y

Why do externalities arise? Edgeworth Box



Suppose we start at W2, what happens?

B wants to have less Y, but this imposes a cost on A

Therefore, B has to pay A to get less Y

B pays A in units of X, move to Z2, Pareto optimum

Why do externalities arise? Edgeworth Box

In the previous example we were able to achieve the Pareto optimum even with a public good / externality

Why do externalities arise? Edgeworth Box

In the previous example we were able to achieve the Pareto optimum even with a public good / externality

Why?

Why do externalities arise? Edgeworth Box

In the previous example we were able to achieve the Pareto optimum even with a public good / externality

Why?

1. Property rights were assigned to either A or B

Why do externalities arise? Edgeworth Box

In the previous example we were able to achieve the Pareto optimum even with a public good / externality

Why?

1. Property rights were assigned to either A or B
2. Transactions costs were low (didn't have to pay a fee to trade X)

Property rights and externalities

A solution to many externalities is to just assign property rights and let the market do its thing

Property rights and externalities

A solution to many externalities is to just assign property rights and let the market do its thing

We'll talk about a few ways that we can assign property rights

Transactions costs and externalities

Now suppose there were many non-smokers

Transactions costs and externalities

Now suppose there were many non-smokers

Even if they were assigned the property rights, it might be hard for them to bargain

- Takes a lot of time to find something that works for everyone
- Negotiating over how much X each person gets

Transactions costs and externalities

Now suppose there were many non-smokers

Even if they were assigned the property rights, it might be hard for them to bargain

- Takes a lot of time to find something that works for everyone
- Negotiating over how much X each person gets

The costs of bargaining may exceed the benefits and we end up stuck at W2

Transactions costs and externalities

Road noise: drivers implicitly have property rights to noise around roads

Transactions costs and externalities

Road noise: drivers implicitly have property rights to noise around roads

Even if you prefer quiet, you can't negotiate a payment with every loud car that might pass pay

The free-rider problem

Externalities and public goods/bads often exhibit many of the same features

Both are subject to the Free-Rider Problem

> A type of market failure that occurs when those who benefit from resources, public goods (such as public roads or hospitals), or services of a communal nature do not pay for them[1] or under-pay

e.g.

- people don't pay their taxes for publicly-provided services
- non-smokers will wait for others to pay in order to reduce smoke

The provision of public goods

Public goods

How do we efficiently provide public goods?

We know:

- Private goods: PMB = PMC $\leftrightarrow$ SMB = SMC
- Goods with negative externalities: PMB = SMC $\leftrightarrow$ SMB = SMC
- goods with positive externalities: SMB = PMC $\leftrightarrow$ SMB = SMC

Public goods

How do we efficiently provide public goods?

We know:

- Private goods: PMB = PMC $\leftrightarrow$ SMB = SMC
- Goods with negative externalities: PMB = SMC $\leftrightarrow$ SMB = SMC
- goods with positive externalities: SMB = PMC $\leftrightarrow$ SMB = SMC

Suppose we have a public good, e.g. depth of a river for public use

How do we decide the socially efficient depth?

Public goods

Optimal provision is **always** given by: SMB = SMC

What are the SMB and SMC for a public good?

Public goods

Optimal provision is **always** given by: SMB = SMC

What are the SMB and SMC for a public good?

Think about the characteristics of a public good, one of them is critical:

Public goods

Optimal provision is **always** given by: SMB = SMC

What are the SMB and SMC for a public good?

Think about the characteristics of a public good, one of them is critical:

Non-rival: multiple people can use the same unit of a good (one person using the river doesn't 'use up' its depth)

Public goods

Optimal provision is **always** given by: SMB = SMC

What are the SMB and SMC for a public good?

Think about the characteristics of a public good, one of them is critical:

Non-rival: multiple people can use the same unit of a good (one person using the river doesn't 'use up' its depth)

This means multiple people can derive benefits from the provision of 1 unit of the good

Optimal provision of public goods

What does this mean?

Optimal provision of public goods

What does this mean?

When we count up the SMB, we need to add up **everyone's** PMB:

Optimality: $SMB = \sum_i PMB_i = PMC$

Optimal provision of public goods

What does this mean?

When we count up the SMB, we need to add up **everyone's** PMB:

Optimality: $SMB = \sum_i PMB_i = PMC$

If we ignore the fact that public goods are non-rival, we get underprovision of the good

Optimal provision of public goods

What does this mean?

When we count up the SMB, we need to add up **everyone's** PMB:

Optimality: $SMB = \sum_i PMB_i = PMC$

If we ignore the fact that public goods are non-rival, we get underprovision of the good

e.g. the free market underprovides clean air, national defense, etc

Modeling the provision of public goods

How do we model public goods?

Modeling the provision of public goods

How do we model public goods?

Here's how to think about it:

Modeling the provision of public goods

How do we model public goods?

Here's how to think about it:

For private goods:

Modeling the provision of public goods

How do we model public goods?

Here's how to think about it:

For private goods:

Private goods are rival, only one person can consume each unit

Modeling the provision of public goods

How do we model public goods?

Here's how to think about it:

For private goods:

Private goods are rival, only one person can consume each unit

At each price, what is the total quantity that is demanded?

Modeling the provision of public goods

How do we model public goods?

Here's how to think about it:

For private goods:

Private goods are rival, only one person can consume each unit

At each price, what is the total quantity that is demanded?

At each price, we need to add up quantities

Modeling the provision of public goods

How do we model public goods?

Here's how to think about it:

For private goods:

Private goods are rival, only one person can consume each unit

At each price, what is the total quantity that is demanded?

At each price, we need to add up quantities

Private goods: we add demand curves horizontally

Modeling the provision of public goods

For public goods:

Modeling the provision of public goods

For public goods:

Public goods are non-rival, multiple people can consume each unit

Modeling the provision of public goods

For public goods:

Public goods are non-rival, multiple people can consume each unit

At each quantity, what is the total marginal benefit?

Modeling the provision of public goods

For public goods:

Public goods are non-rival, multiple people can consume each unit

At each quantity, what is the total marginal benefit?

At each quantity, we need to add up PMBs/prices

Modeling the provision of public goods

For public goods:

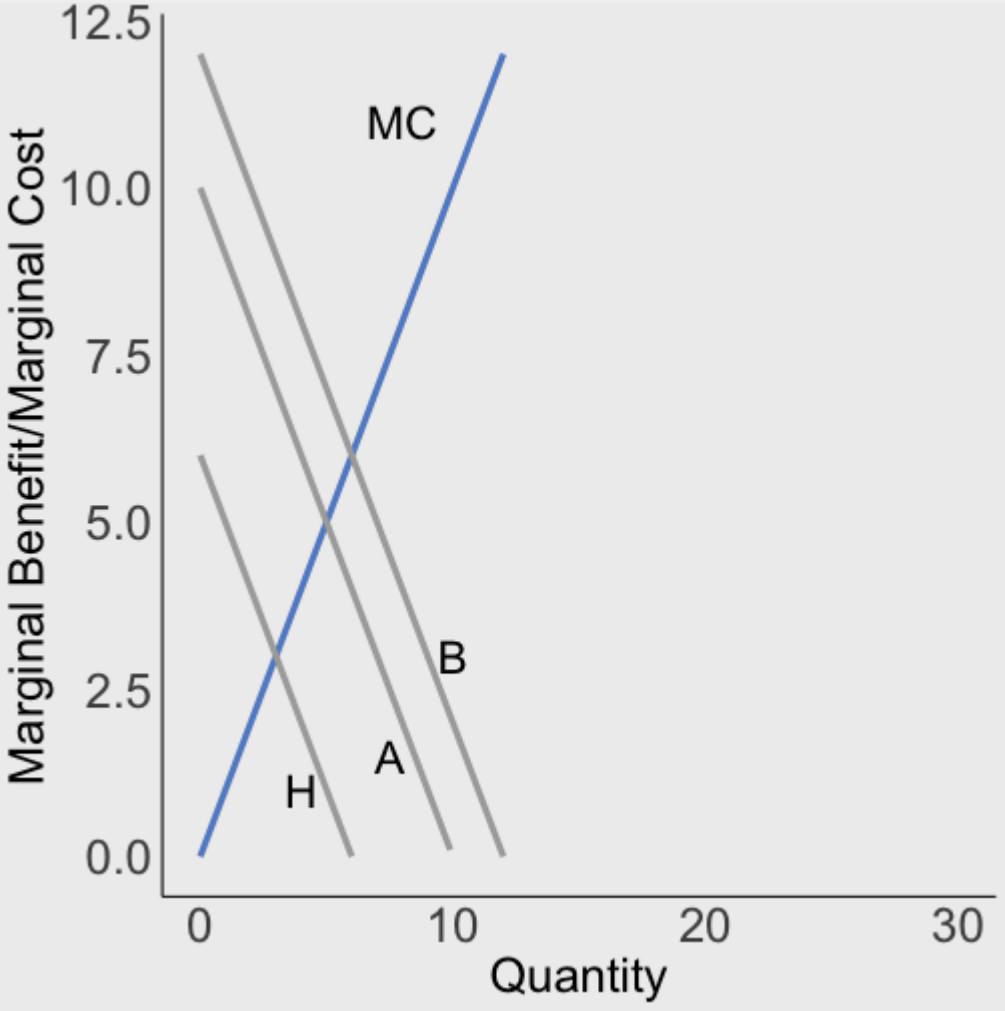
Public goods are non-rival, multiple people can consume each unit

At each quantity, what is the total marginal benefit?

At each quantity, we need to add up PMBs/prices

Public goods: we add demand curves vertically

Public goods: graphical

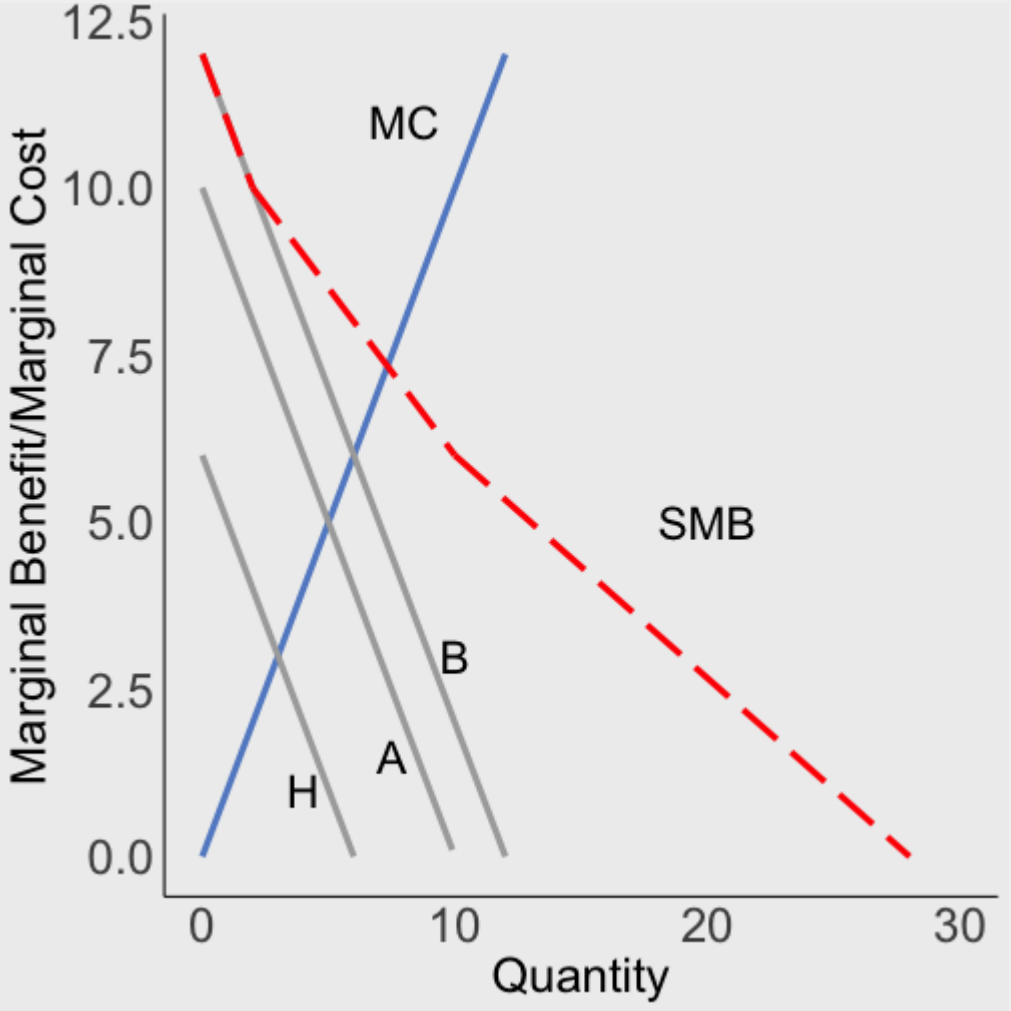


3 different groups: boaters (B), anglers (A), and hikers (H)

Each has a different marginal benefit for water depth:

- Boaters: MB = 12-Q
- Anglers: MB = 10-Q
- Hikers: MB = 6-Q

Public goods: graphical

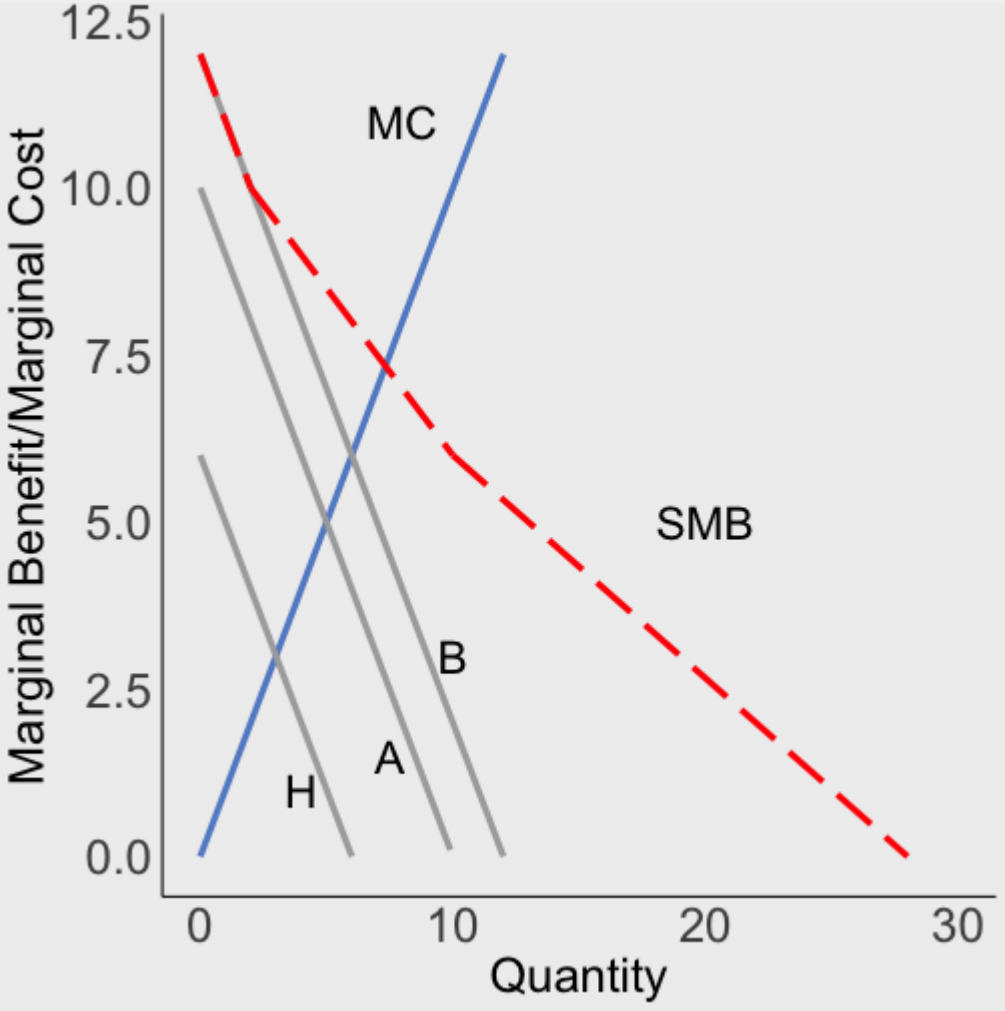


Now we need to aggregate them to get the social marginal benefit

We do so by adding up the demand curves horizontally:

At each price: sum the Qs that are demanded

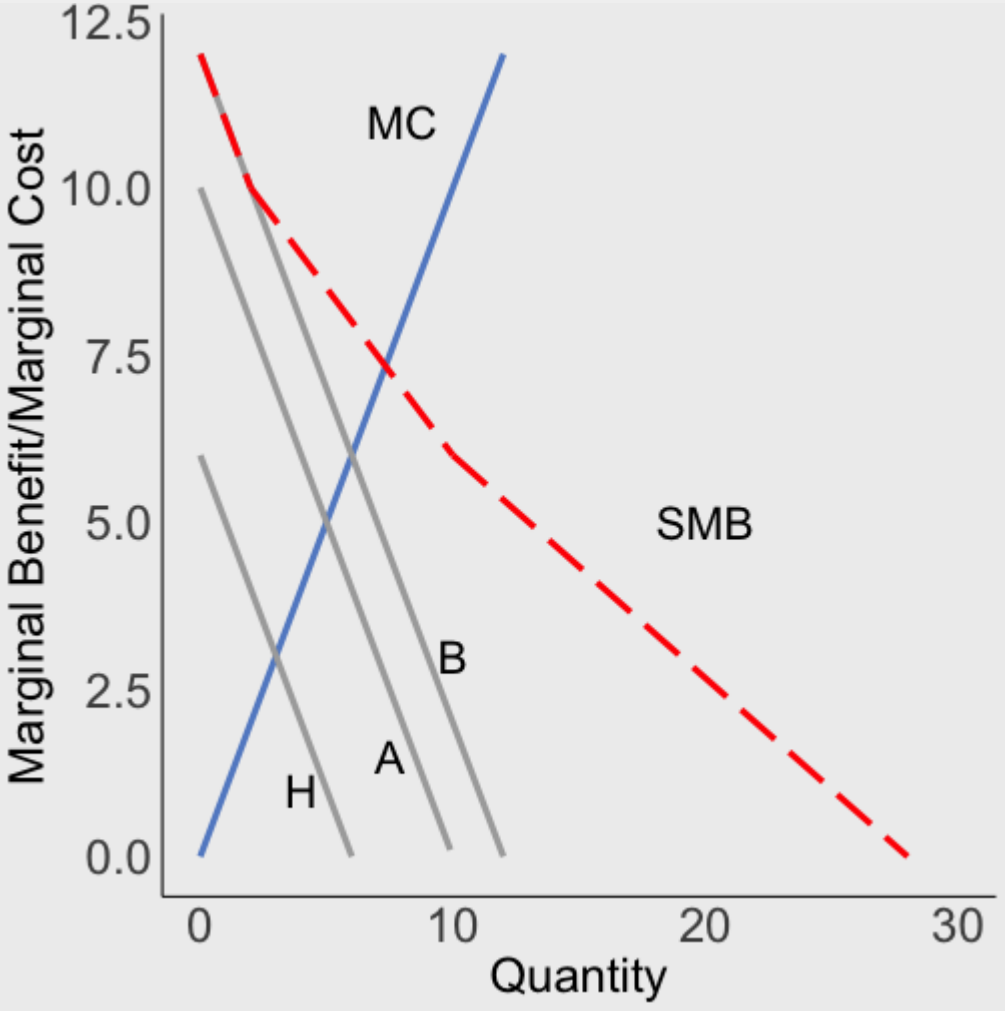
Public goods: graphical



Why is the aggregate demand curve kinked?

Because at each price, only certain groups are willing to pay to use the public good

Positive externalities: graphical

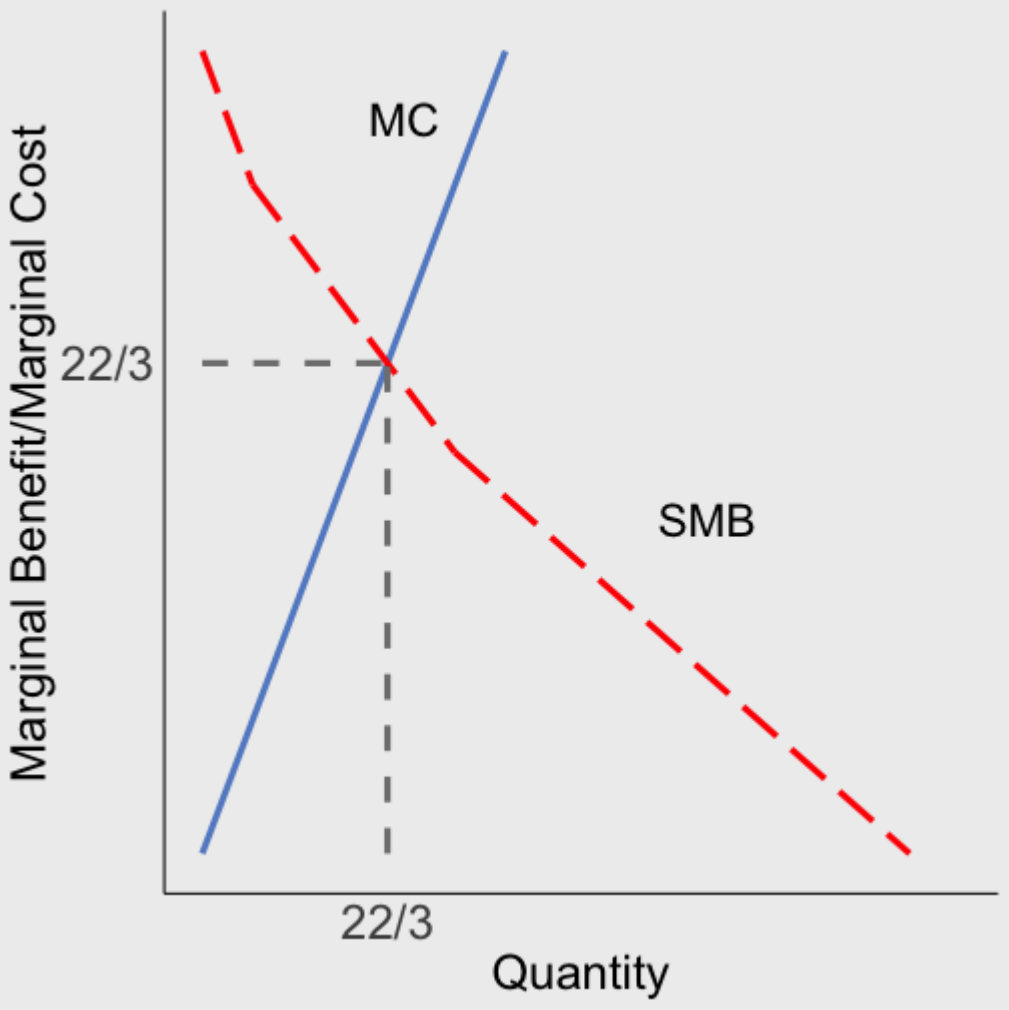


At prices > 10, only boaters are willing to pay

At prices > 6 and <= 10, only boaters and anglers are willing to pay

At prices =< 6 all groups are willing to pay to use the river

Public goods: graphical



The optimal provision of the public good is where the MC curve crosses the SMB curve

The optimal quantity of 22/3 is greater than the quantity any individual group would be willing to purchase

Public goods financing

The socially optimal quantity is greater than the individual privately optimal quantities

Public goods financing

The socially optimal quantity is greater than the individual privately optimal quantities

This means that the MC of provision, MC = 22/3

Public goods financing

The socially optimal quantity is greater than the individual privately optimal quantities

This means that the MC of provision, MC = 22/3

Is this the price the groups pay?

Public goods financing

The socially optimal quantity is greater than the individual privately optimal quantities

This means that the MC of provision, MC = 22/3

Is this the price the groups pay?

No! It is greater than any individual group is willing to pay

Public goods financing

The socially optimal quantity is greater than the individual privately optimal quantities

This means that the MC of provision, MC = 22/3

Is this the price the groups pay?

No! It is greater than any individual group is willing to pay

If the government is able to provide the good, how does it finance the cost raising the river depth above zero?

Public goods financing

It charges each group a share of this price

Public goods financing

It charges each group a share of this price

What share is everyone charged?

Public goods financing

It charges each group a share of this price

What share is everyone charged?

Lindahl pricing: charge each group equal to their marginal benefit

Public goods financing

It charges each group a share of this price

What share is everyone charged?

Lindahl pricing: charge each group equal to their marginal benefit

Boaters pay: 14/3

Anglers pay: 8/3 Hikers: free

Public goods financing

It charges each group a share of this price

What share is everyone charged?

Lindahl pricing: charge each group equal to their marginal benefit

Boaters pay: 14/3

Anglers pay: 8/3 Hikers: free

Notice that the prices sum to the marginal cost!

Public goods financing

It charges each group a share of this price

What share is everyone charged?

Lindahl pricing: charge each group equal to their marginal benefit

Boaters pay: 14/3
Anglers pay: 8/3 Hikers: free

Notice that the prices sum to the marginal cost!

Since the good is non-rival, this is enough to finance the cost

Public goods financing

What is a key problem with Lindahl pricing?

Public goods financing

What is a key problem with Lindahl pricing?

People can lie about which group they're in

Public goods financing

What is a key problem with Lindahl pricing?

People can lie about which group they're in

Anglers might say they're hikers

Public goods financing

What is a key problem with Lindahl pricing?

People can lie about which group they're in

Anglers might say they're hikers

It requires perfect information on behalf of the regulator