Principles of Economics

Public Economics

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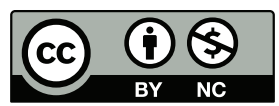


Introduction

- Market economy allocates resources through the decentralized decisions of many firms and households as they interact in markets for goods and services.

- Famous insight by Adam Smith in The Wealth of Nations (1776): Each of these households and firms acts as if "*led by an invisible hand*" to promote general economic well-being.

Introduction

The invisible hand works through the price system:

- The interaction of buyers and sellers determines prices.
- Each price reflects the good's value to buyers and the cost of producing the good.
- Prices guide self-interested households and firms to make decisions that, *in absence of market failures*, maximize economy's total surplus (**First Welfare Theorem**).

Introduction

Market failure: when the market fails to allocate society's resources efficiently.

Causes of market failure:

- **Market power**: a single buyer or seller has substantial influence on market price (e.g. monopoly)
- **Externalities**: the uncompensated impact of one person's actions on the well-being of a bystander (e.g. pollution)

Externality

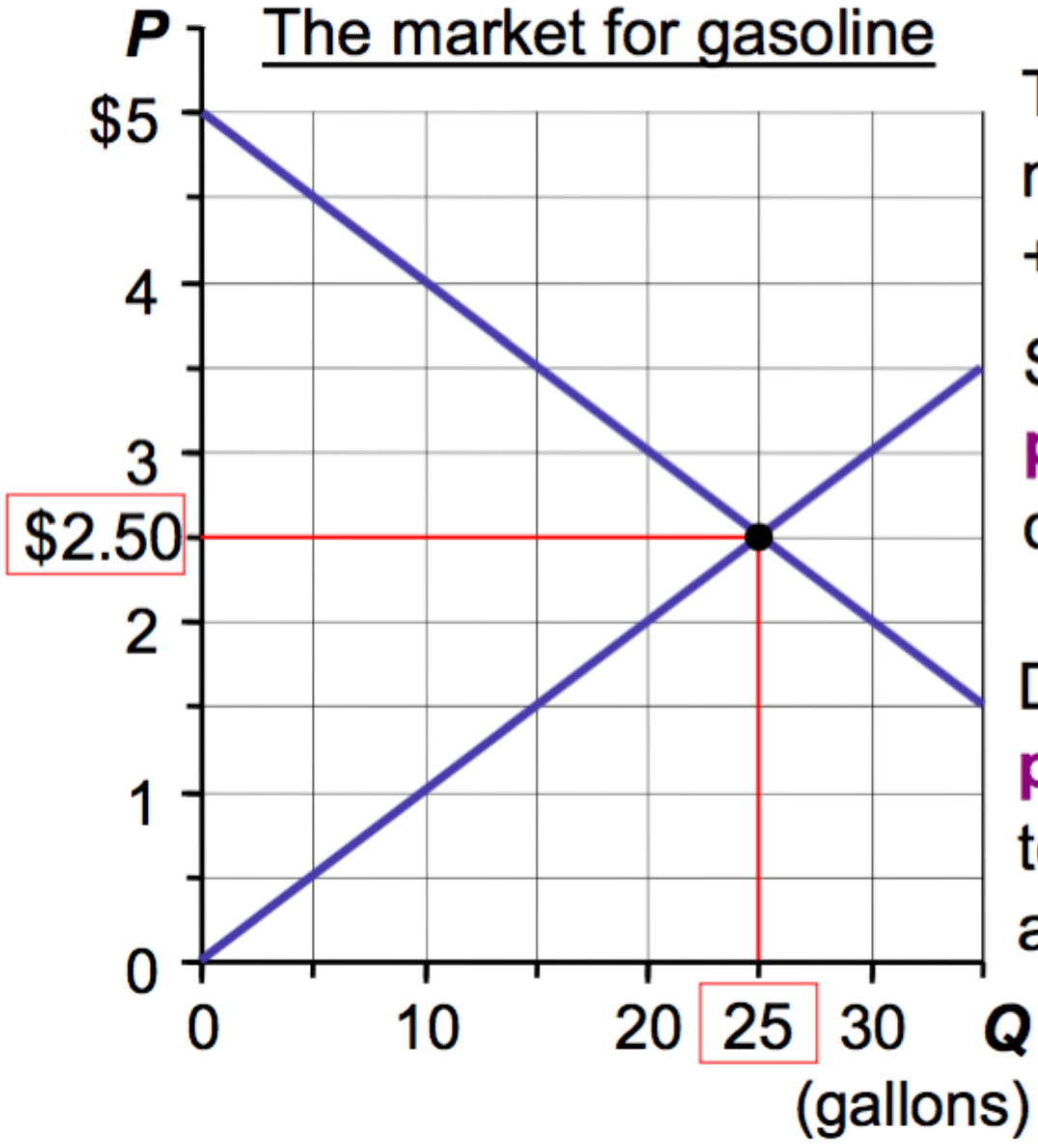
- Externalities can be negative or positive, depending on whether impact on bystander is adverse or beneficial.
- Self-interested buyers and sellers neglect the external costs or benefits of their actions, so the market outcome is not efficient.
- In the presence of externalities, it is *possible* for government policy to improve efficiency.

Examples of Negative Externalities

- Air pollution from a factory
- Noise pollution from construction projects
- Health risk to others from second-hand smoke
- Congestion from road usage

Negative Externality

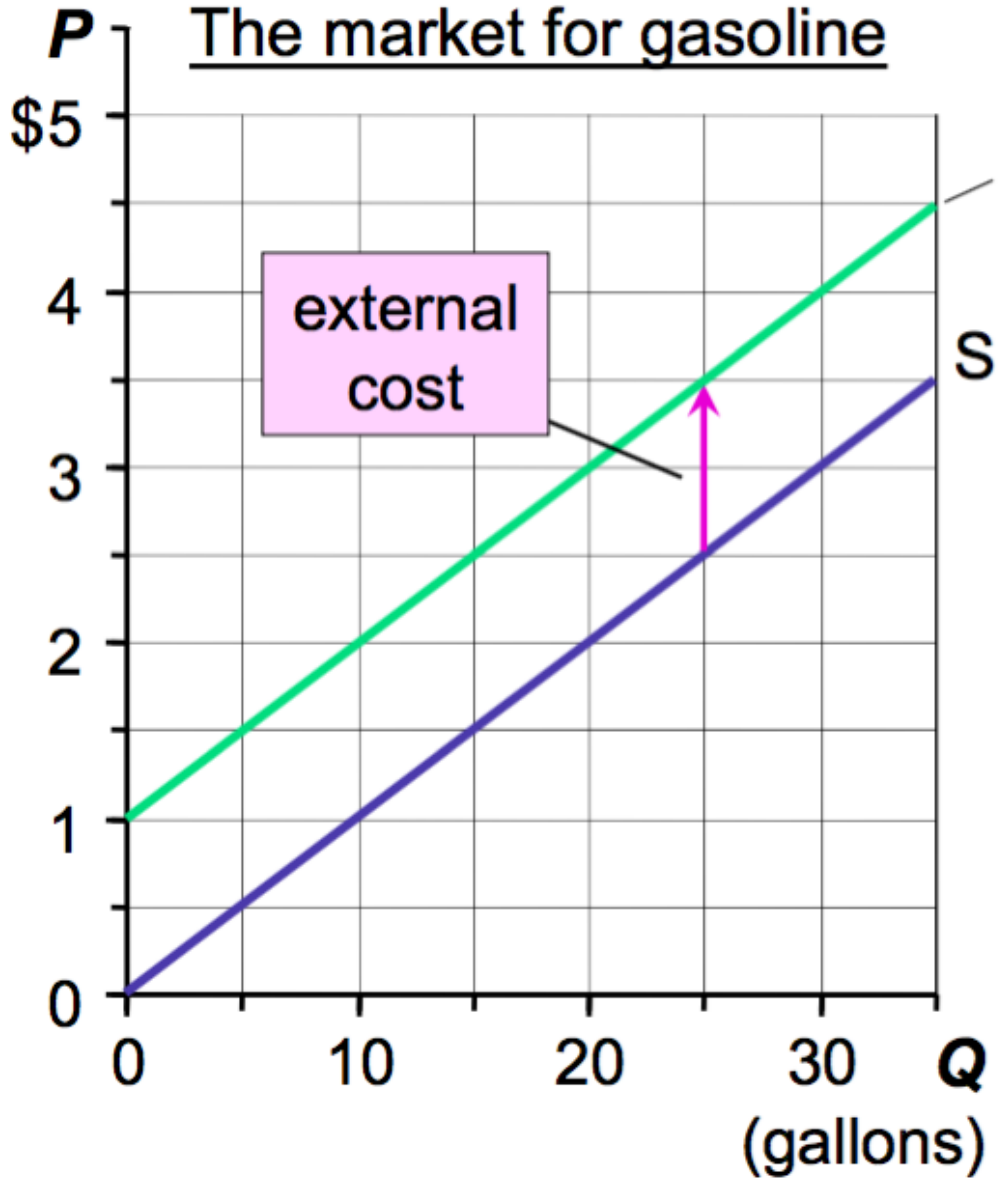
- The market allocates resources in a way that maximizes the total value to the buyers minus the total costs to the producers.
- In the presence of a negative externality, the **social cost** of a good exceeds its production cost.
- Social cost = private cost + external cost
  - **Private cost**: the direct cost to sellers
  - **External cost**: the cost to bystanders



The market eq'm maximizes consumer + producer surplus.

Supply curve shows **private cost**, the costs directly incurred by sellers.

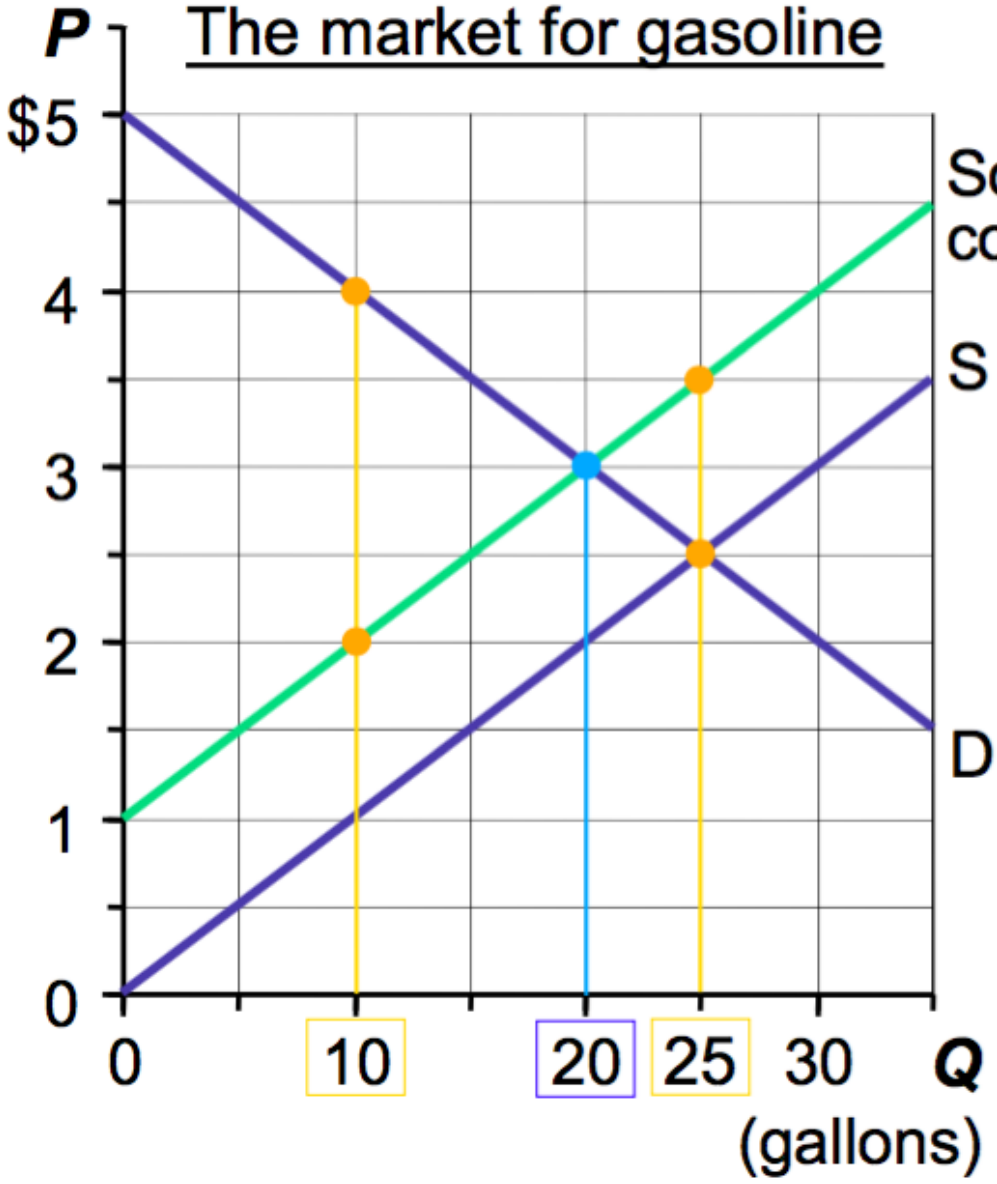
Demand curve shows **private value**, the value to buyers (the prices they are willing to pay).



Social cost
= private + external cost

Supply (private cost)

External cost
= value of the negative impact on bystanders
= $1 per gallon (value of harm from smog, greenhouse gases)

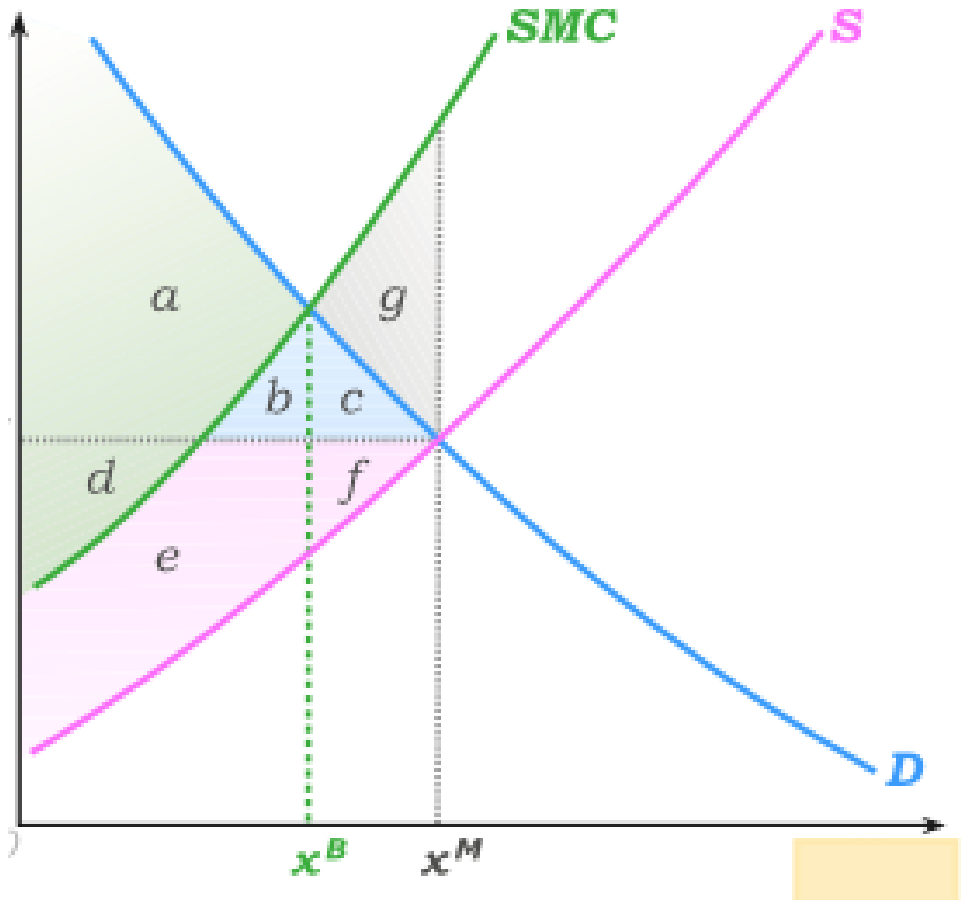


The socially optimal quantity is 20 gallons.

At any **Q** < 20, value of additional gas

At any **Q** > 20, social cost of the last gallon is greater than its value to society.

Welfare Analysis of a Negative Externality



At market equilibrium (x^M): CS=a+b+c, PS=d+e+f
External cost=b+c+e+f+g, TS=a+d-g
DWL=g

Internalizing the Externality

- In the presence of a negative externality, the **socially optimal quantity** is less than the quantity determined by the private market.
- One way to achieve the socially optimal quantity is to tax the good with negative externality: if the tax *accurately*[1] reflects the external cost of the good, the new market equilibrium would produce the socially optimal quantity.
- **Internalizing the externality**: altering incentives so that people take account of the external effects of their actions.
- When market participants must pay the social costs, market equilibrium = social optimum.

[1] Of course, that's a big "if"!

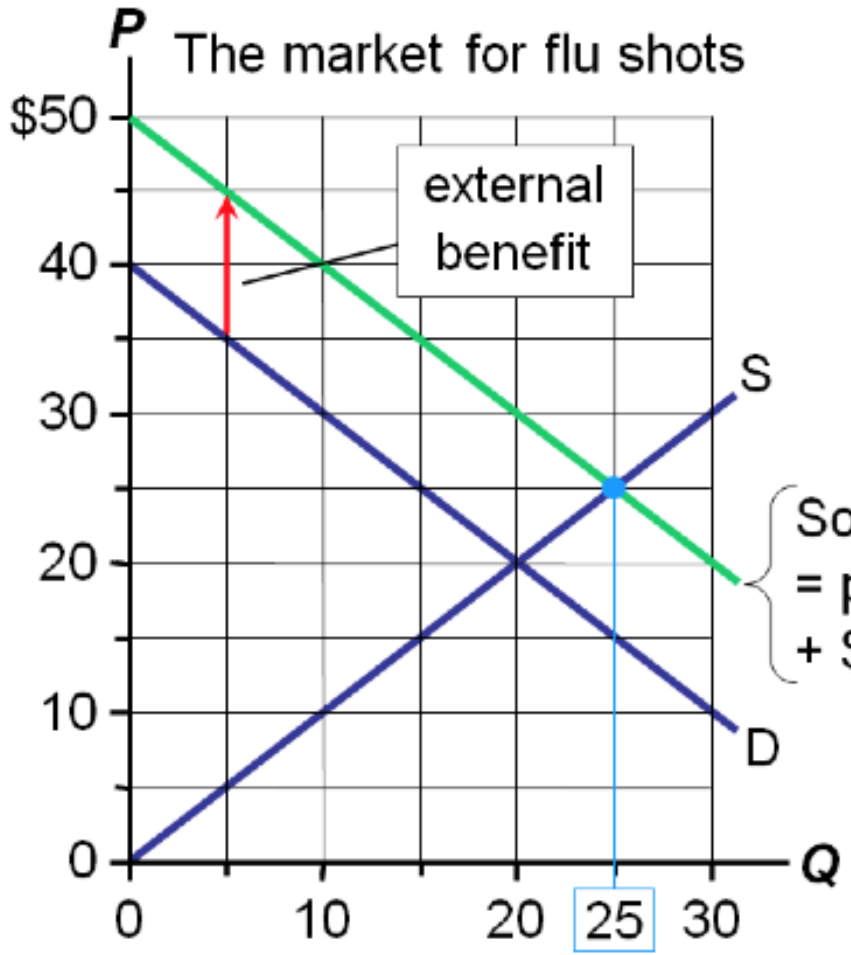
Examples of Positive Externalities

- Being vaccinated against contagious diseases protects not only you, but people around you.
- Education benefits both the individual and the society in which he or she participates.
- R&D creates knowledge that others can use.
- Art and music improves a society's culture. Public artworks bring aesthetic enjoyment to all.

Positive Externality

- In the presence of a positive externality, the **social value** of a good includes:
  - **Private value** – the direct value to buyers
  - **External benefit** – the value of the positive impact on bystanders
- In this case, the socially optimal quantity is greater than the quantity determined by the private market.

Suppose the external benefit of a flu shot is \$10, then a \$10/shot subsidy would internalize the positive externality.

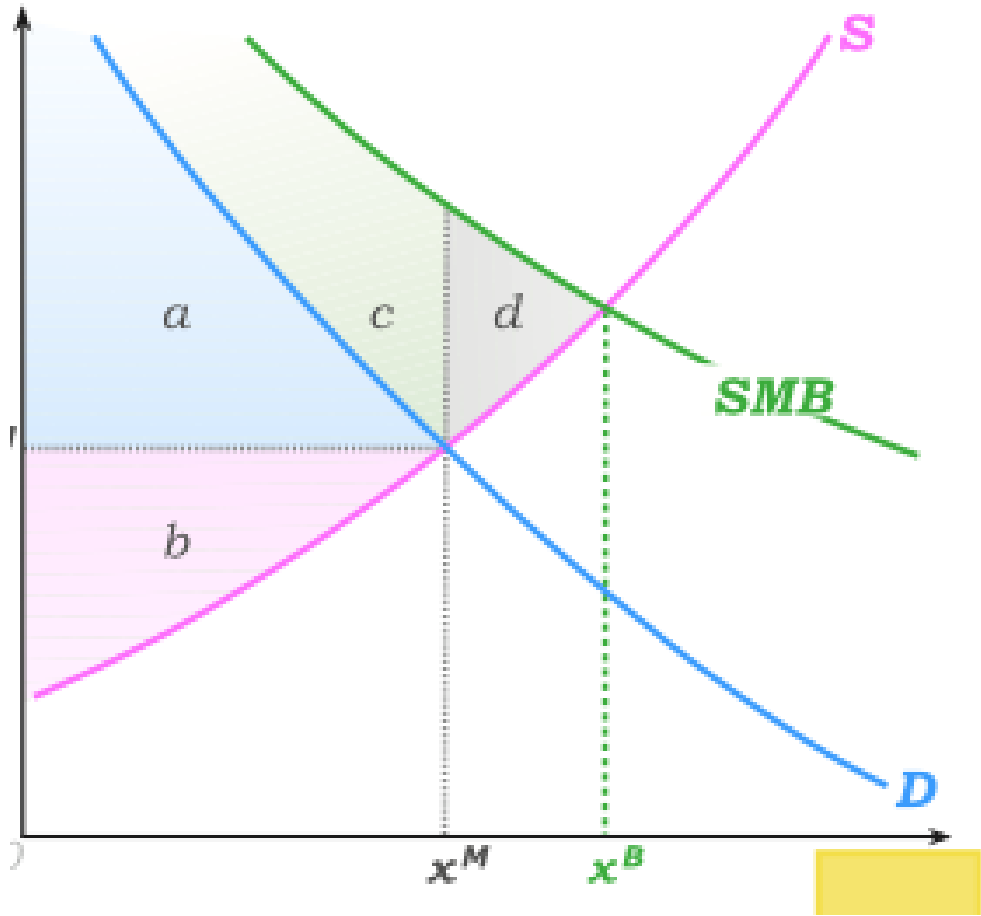


Socially optimal **Q** = 25 shots.

To internalize the externality, use subsidy = \$10/shot.

Social value = private value + \$10 external benefit

Welfare Analysis of a Positive Externality



At market equilibrium (x^M): CS=a, PS=b, External benefit=c, TS=a+b+c

DWL=d

Effects of Externalities: Summary

- If negative externality
  - market quantity larger than socially desirable
- If positive externality
  - market quantity smaller than socially desirable
- To remedy the problem: "internalize the externality"

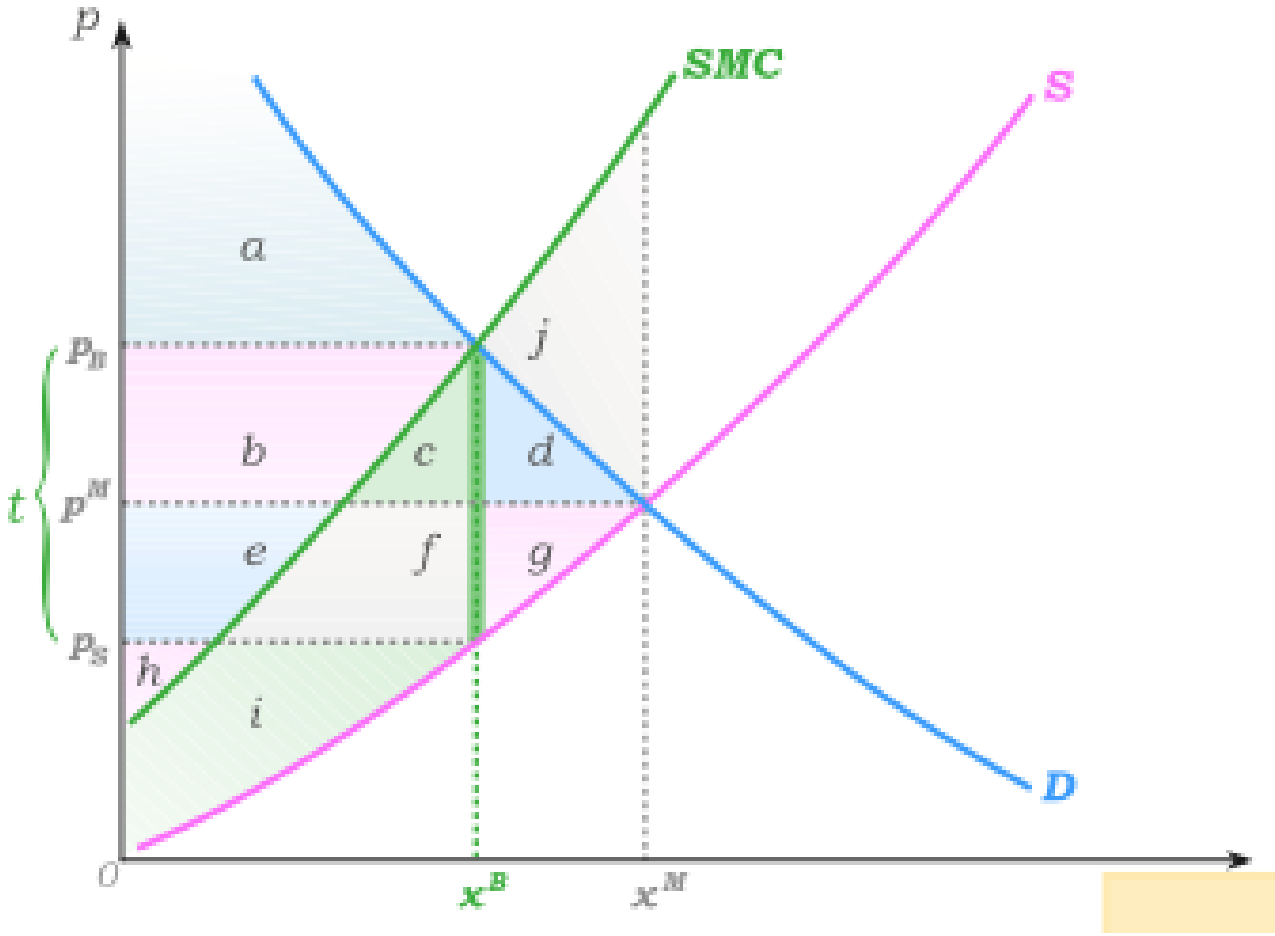
Public Policies Towards Externalities

- **Command-and-control** policies regulate behavior directly.
  - limits on quantity of pollution emitted
  - requirements that firms adopt a particular technology to reduce emissions
- **Market-based** policies provide incentives so that private decision-makers will choose to solve the problem on their own.
  - Corrective taxes and subsidies
  - Tradable pollution rights

Corrective Tax

- **Corrective tax** is also called Pigouvian tax. The ☼*ideal*☼ corrective tax = external cost.
- Corrective taxes not only raise revenue for the government, but also enhance economic efficiency.
- For activities with positive externalities, ☼*ideal*☼ **corrective subsidy** = external benefit.

Corrective Tax

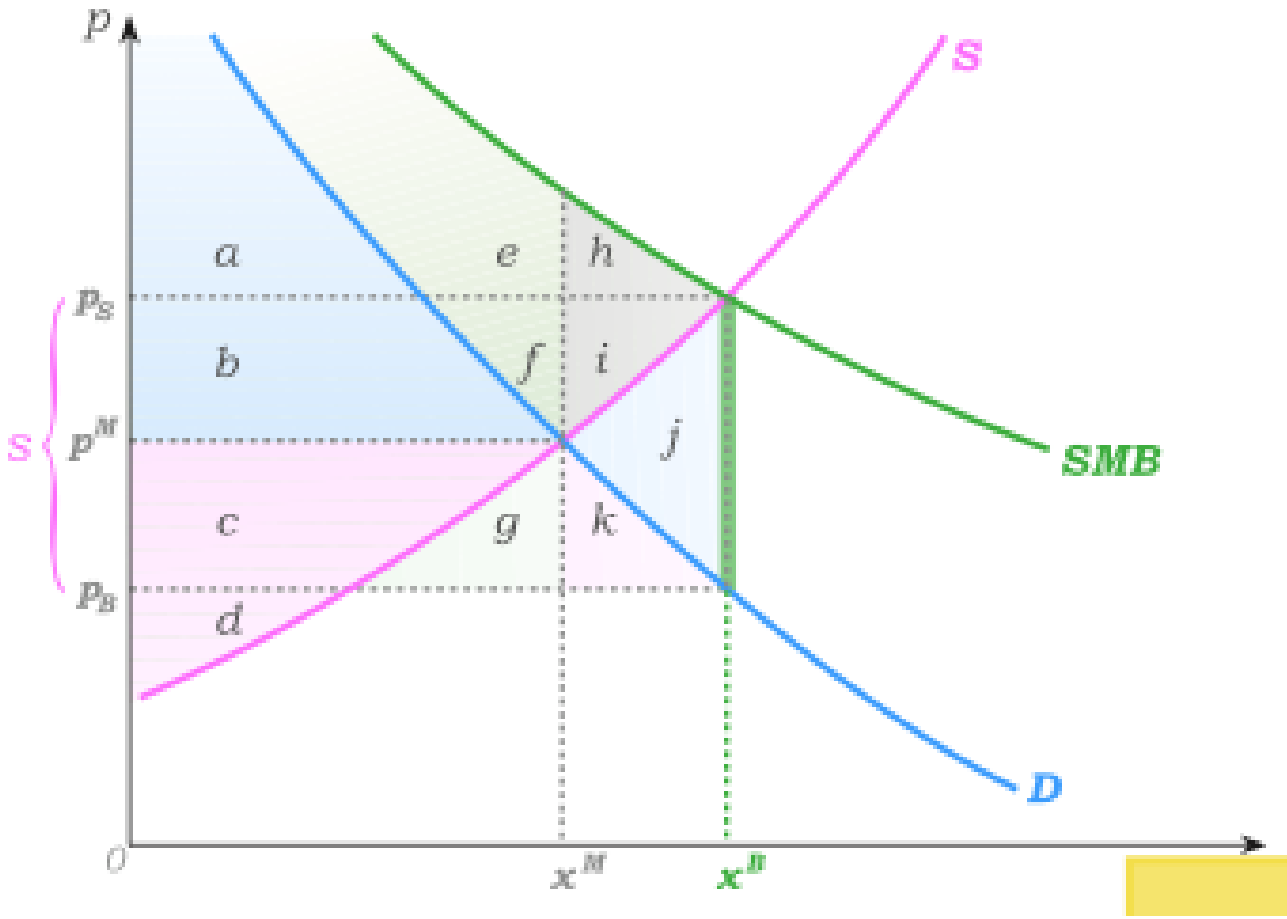


CS=a, PS=h+i, Tax=b+c+e+f
External cost=c+f+i, TS=a+b+e+h

Example of a Corrective Tax: The Gas Tax

- The gas tax targets three negative externalities:
  - Congestion
    - ★ The more you drive, the more you contribute to congestion.
  - Accidents
    - ★ Large vehicles and sports cars cause more damage in an accident.
  - Pollution
    - ★ Burning fossil fuels produces greenhouse gases.

Corrective Subsidy



CS=a+b+c+g+k, PS=b+c+d+f+i, Subsidy=b+c+f+g+i+j+k
External benefit=e+f+h+i+j, TS=a+b+c+d+e+f+h+i

Tradable Pollution Rights

- A market-based approach to control pollution is to assign pollution rights and allow their trading.
- The principal form of trading in pollution rights is a **cap-and-trade** program.
- A cap-and-trade program sets an aggregate limit on the total amount of pollution allowed and creates permits for this amount. The permits are allocated to regulated firms through auction or free distribution and can then be traded freely among firms.

Tradable Pollution Rights

- Cap-and-trade programs reduce pollution more efficiently than command-and-control regulation.
- Different firms have different costs of pollution abatement.
- A command-and-control policy would require all firms to reduce pollution by the same (percentage) amount or adopt the same technology standards.
- Under a cap-and-trade program:
  - Firms with low cost of reducing pollution do so and sell their unused permits.
  - Firms with high cost of reducing pollution buy permits.

Tradable Pollution Rights

Example

Acme and US Electric run coal-burning power plants. Each emits 40 tons of sulfur dioxide per month, total emissions = 80 tons/month.

- Goal: Reduce SO_2 emissions 25%, to 60 tons/month
- Cost of reducing emissions: \$100/ton for Acme, \$200/ton for USE

Tradable Pollution Rights

Example (Cont.)

- Policy option 1: Regulation
  - Every firm must cut its emissions by 25% (10 tons).
- Cost of achieving goal:
  - Cost to Acme: $1000
  - Cost to USE: $2000
  - Total cost: $3000

Tradable Pollution Rights

Example (Cont.)

- Policy option 2: Tradable Pollution Permits
  - Issue 60 permits, each allows one ton SO_2 emissions. Give 30 permits to each firm.
  - Establish market for trading permits.
  - Each firm may use all its permits to emit 30 tons, may emit < 30 tons and sell leftover permits, or may purchase extra permits to emit > 30 tons.
- Suppose Acme uses 20 permits and sells 10 to USE for \$150 each,
  - Cost to Acme: \$500
  - Cost to USE: \$1500
  - Total cost: \$2000

Tradable Pollution Rights

In equilibrium, under a cap-and-trade program:

- Pollution reduction is concentrated among firms with the lowest initial marginal abatement costs.
  - As long as there is a free market for pollution rights, this will result regardless of the initial allocation of pollution rights among firms.
- Marginal cost of abatement is equalized across firms.
  - Equilibrium permit price = marginal cost of abatement.
- Firms have a continued incentive to invest in clean technologies
  - Under a command-and-control policy, firms have no reason to reduce emission further once they have reached the target.
  - Pricing pollution encourages innovation.

Tradable Pollution Rights

As a result, a cap-and-trade program achieves an overall reduction in pollution at the least cost.

- The government does not have to be in the business of picking which industry reduces which type of pollution by how much.
- However, there is no guarantee that the pollution target is set at the socially optimal level.

Cap-and-Trade vs. Pollution Tax

The corrective tax originally proposed by Pigou is a tax on output in polluting industries. However, we can also tax pollution emissions (rather than output) directly.

- For example, a carbon tax is a tax directly imposed on CO2 emissions.
- These taxes are in general called pollution taxes.

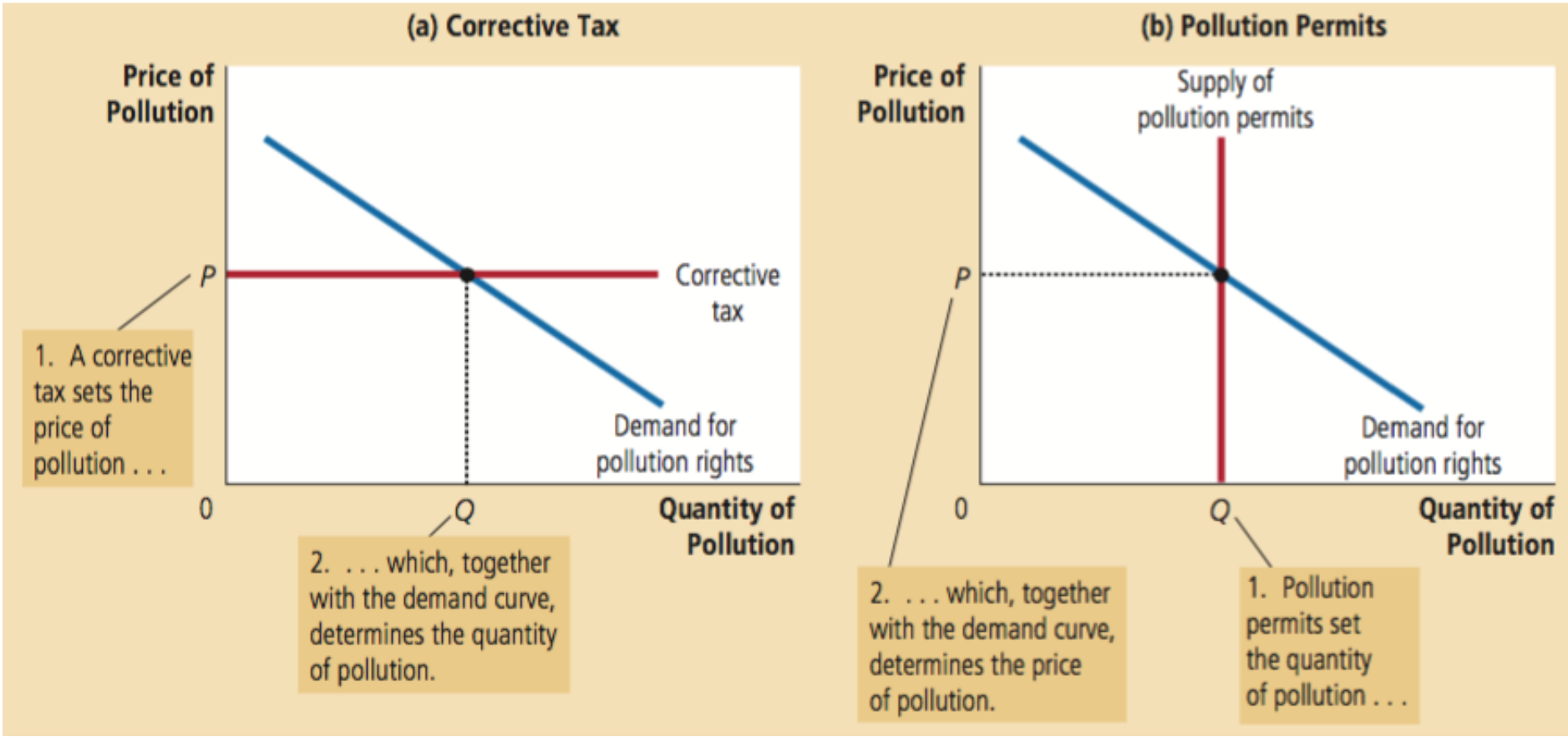
Cap-and-Trade vs. Pollution Tax

When the demand for pollution emissions is fixed and known with certainty, a cap-and-trade program is equivalent to a pollution tax[2].

- A pollution tax fixes the price of emissions and leaves the market to determine the equilibrium quantity.
- A cap-and-trade program fixes the quantity of emissions and leaves the market to determine the price.

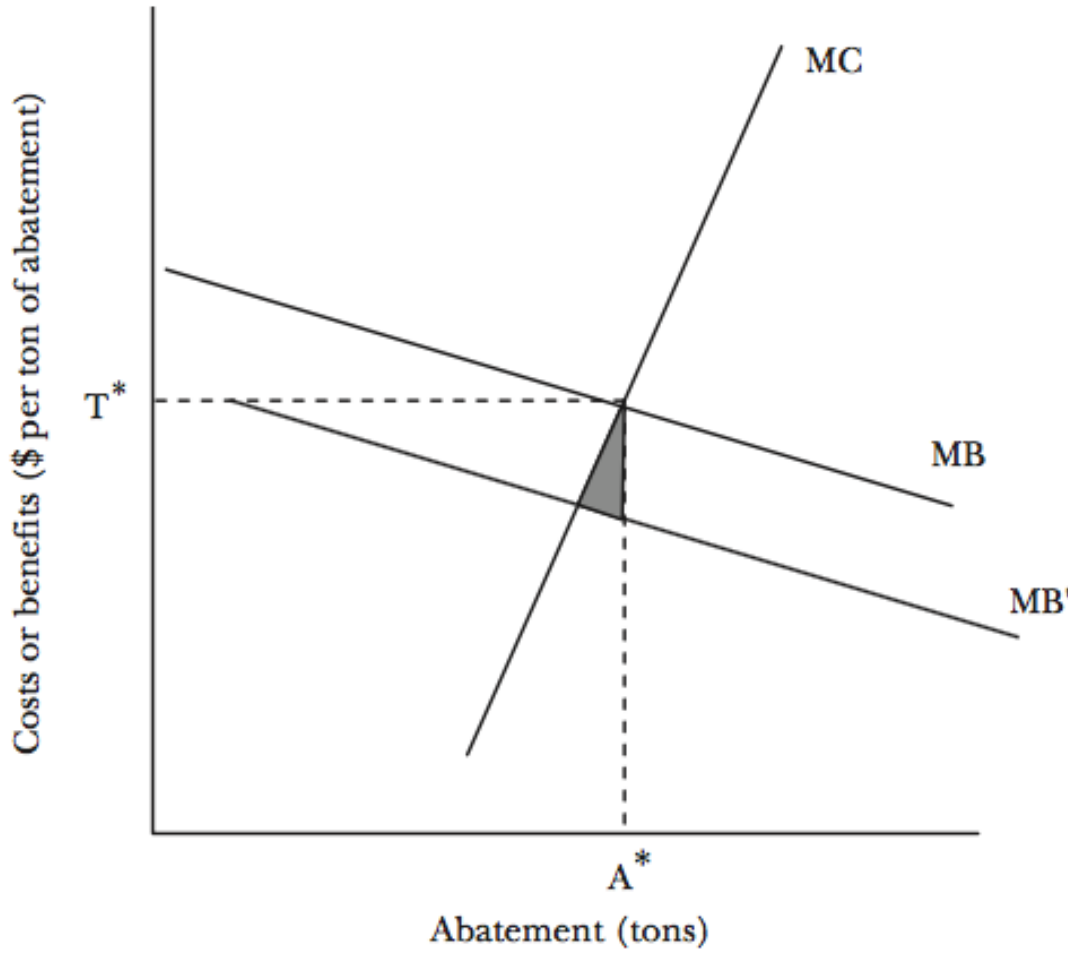
[2] Equivalently: when the marginal costs of pollution abatement are fixed and known with certainty, the two policies are equivalent, otherwise they are not. This is because a firm's demand for pollution emissions derives from its (opportunity) cost of pollution abatement.

Cap-and-Trade vs. Pollution Tax



Equivalence of pollution taxes and tradable pollution permits when demand for pollution emissions is fixed and known with certainty

Uncertainty over the Marginal Benefits of Abatement

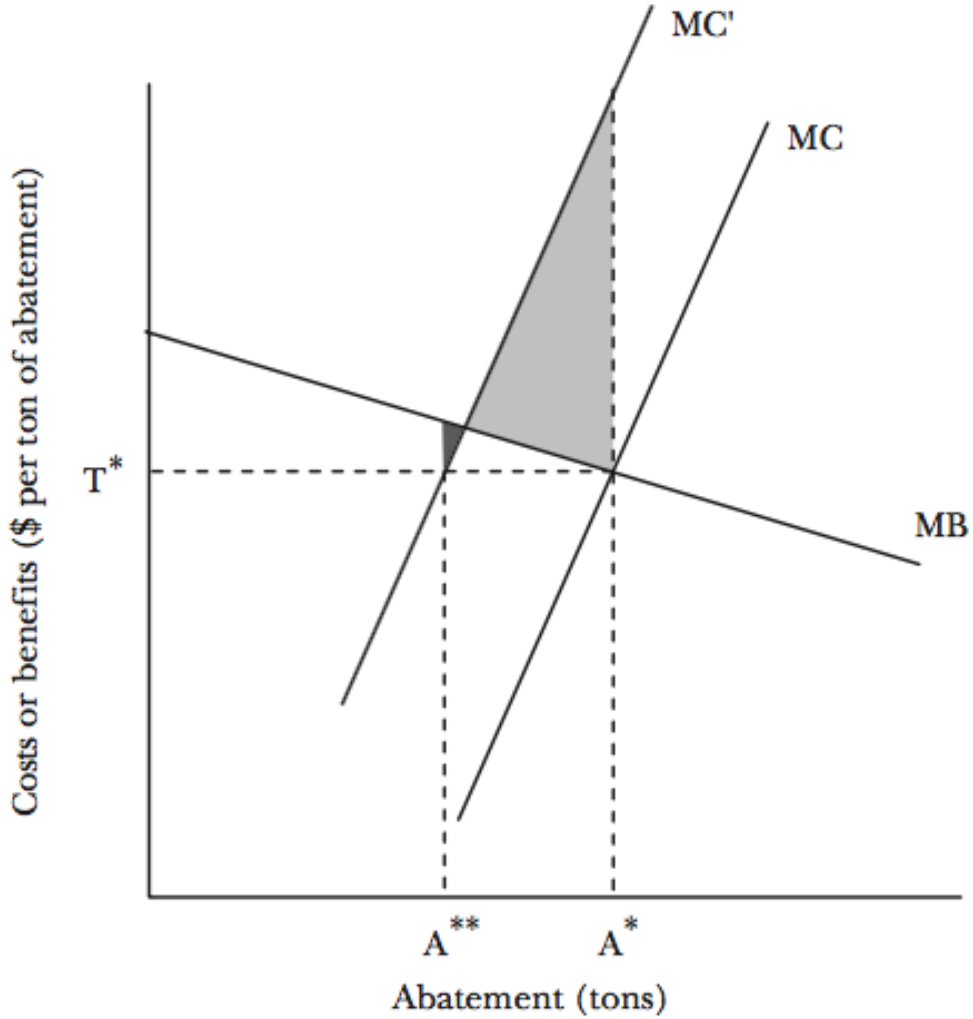


The horizontal axis measures reductions in emissions. The marginal benefits (MB) curve reflects the social benefits of pollution reduction. From the polluter's point of view, the marginal benefit of abatement is zero. Source: Metcalf (2009)

Uncertainty over the Marginal Benefits of Abatement

- In the absence of policy, the firm would undertake no abatement activities.
- If a tax T^* is levied, the firm's private marginal benefit of emissions abatement will equal T^* and abatement amounts of A^* will occur.
- If a cap on emissions is set at A^*, the marginal cost of abatement – and the implied price of emission permits – will equal T^*.
- If the true social marginal benefit curve is MB' instead of MB, the two policies – pollution tax and emission cap – will result in equally inefficient outcomes.

Uncertainty over the Marginal Costs of Abatement



Source: Metcalf (2009)

Uncertainty over the Marginal Costs of Abatement

- If MC' is the true marginal abatement cost curve (or if MC shifts to MC'), then tax will lead to A^{**} of abatement.
- When there is uncertainty over MC, or if MC shifts frequently, taxation results in lower expected DWL.

Cap-and-Trade vs. Pollution Tax

- Demand for pollution emissions can shift frequently and substantially due to changes in business and macroeconomic conditions as well as to the development of new technology.
  - This means that the MC curve can shift frequently and substantially.
- Fluctuations in emissions demand favors the tax approach.
  - Less expected DWL
  - Less price volatility

Cap-and-Trade vs. Pollution Tax

- A cap-and-trade program can have more political appeal: it makes it easier to set emission goals and control more precisely the amount of pollution emissions.
- Neither system automatically results in full efficiency unless the government has lots of information on what the marginal benefits and costs of abatement are in every period and can adjust policies in response to changes.

Cap-and-Trade Programs

Sulfur Dioxide and Nitrogen Oxides Emissions

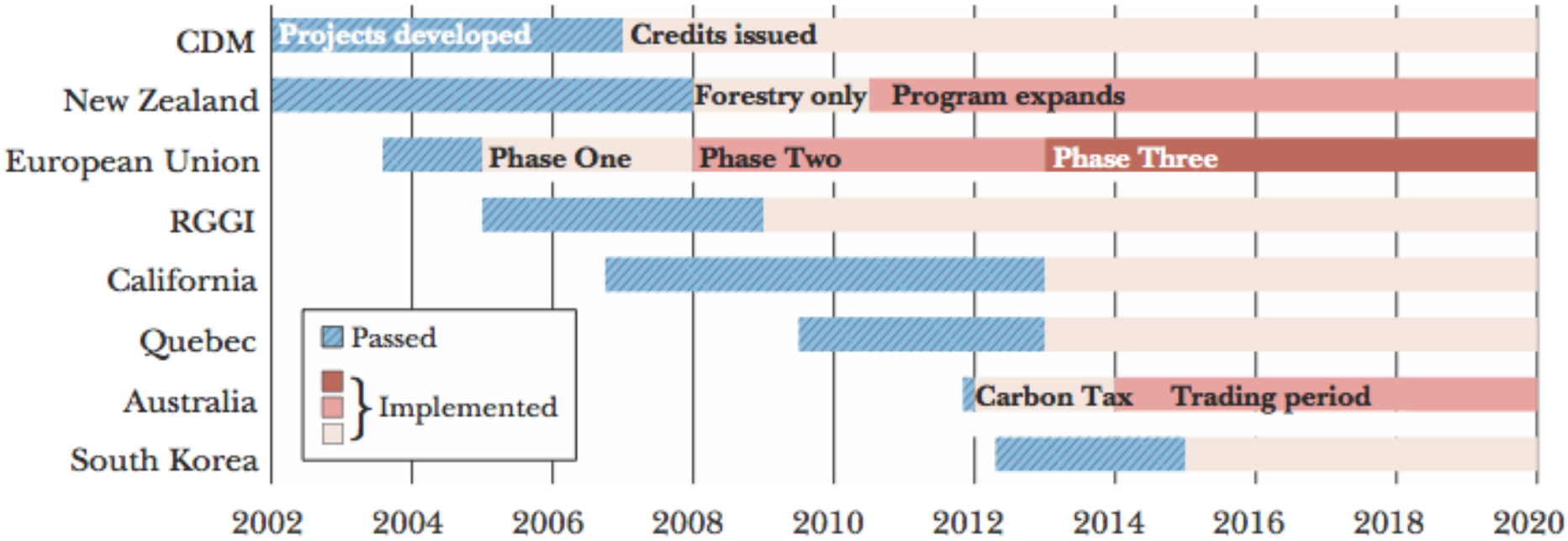
- The U.S. Acid Rain Program
  - Established under the 1990 Clean Air Act Amendment.
  - 1995 – Current

Cap-and-Trade Programs

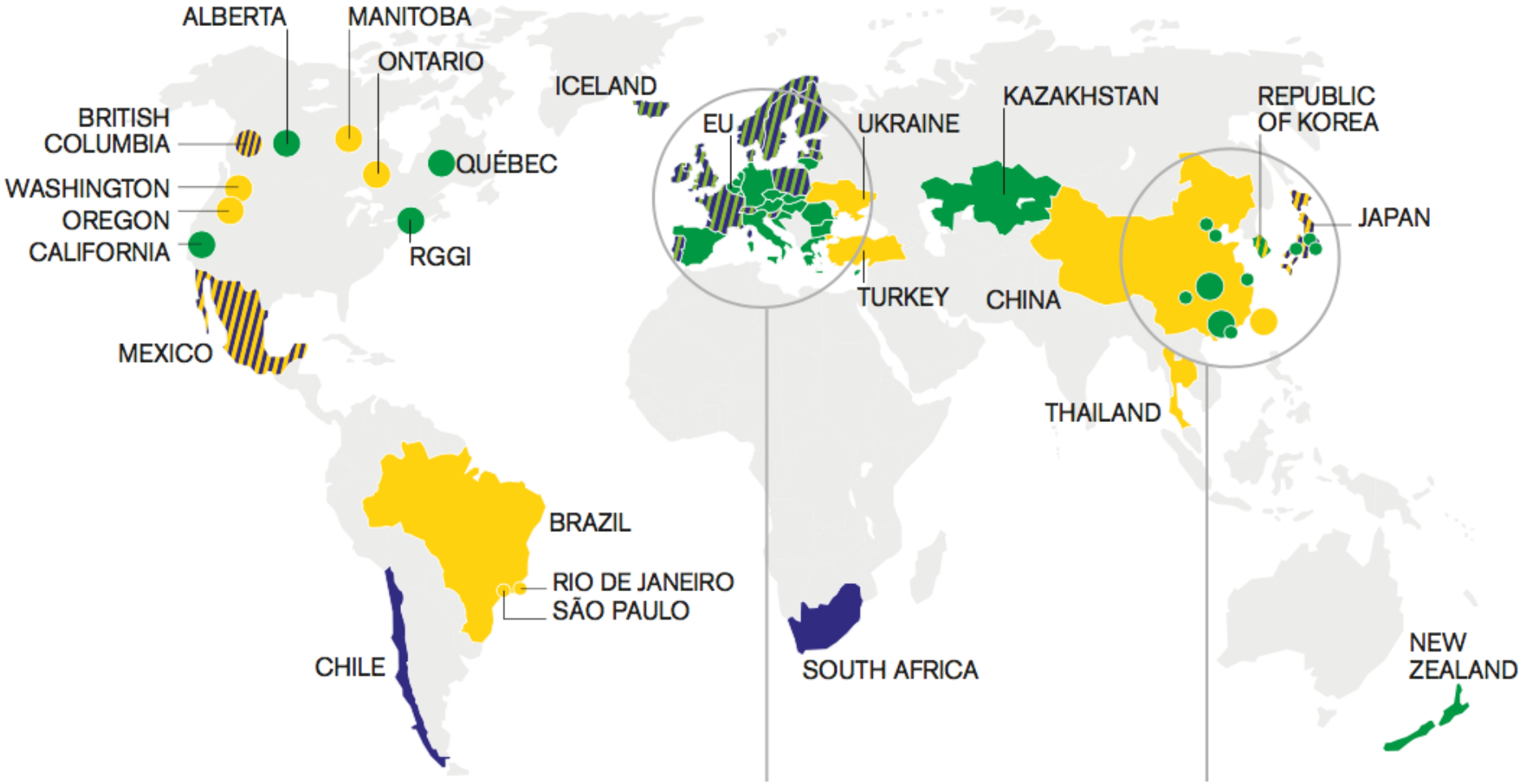
Greenhouse Gas Emissions

- The European Emissions Trading System (EU ETS)
  - 2005 – Current
- The New Zealand Emissions Trading Scheme (NZ ETS)
  - 2008 – Current
- The Regional Greenhouse Gas Initiative (RGGI)
  - Northeastern U.S., 2009 – Current

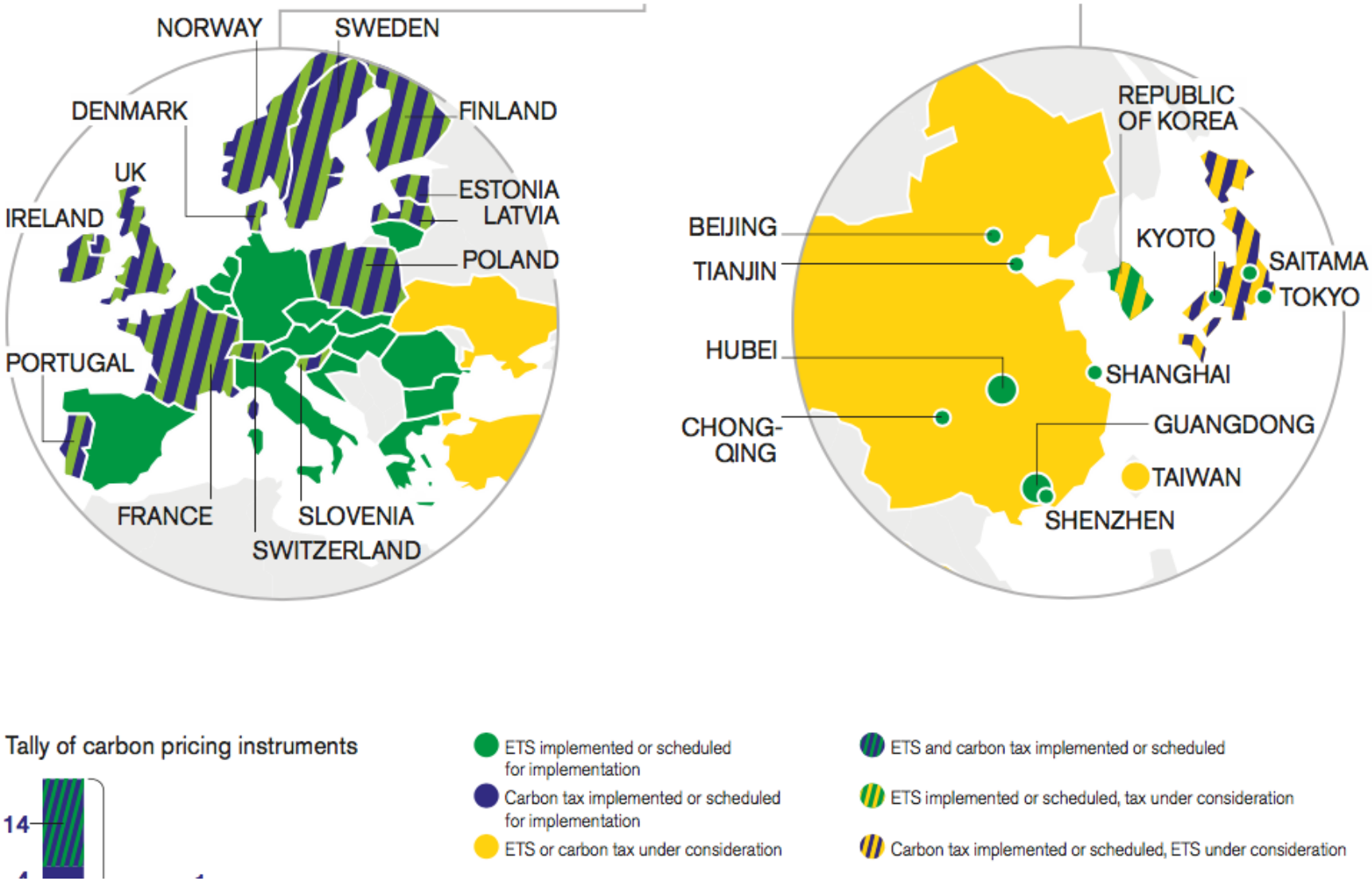
Timeline for Selected GHG Emissions Trading Programs



Source: Newell, Pizer, and Raimi (2013)



Carbon pricing instruments around the world. Source: The World Bank (2015)



Carbon pricing instruments around the world. Source: The World Bank (2015)

Externalities: Market Failure or Failure of Markets to Exist?

- We have seen that markets by themselves will produce inefficient quantities of goods that exhibit positive or negative externalities.
  - Externalities are therefore are thought of as a form of market failure.
- But externalities can also be thought of as due to a failure of markets to exist.
  - Air pollution is a problem because there is no market for clean air, otherwise polluting firms would have to pay for the right to contaminate it, i.e. the cost of pollution would be internalized.

Property Rights and Missing Markets

- The failure of markets to exist is in turn due to a lack of established property rights.
  - No system of property rights exists for clean air.
- Externalities arise in the absence of well established property rights.
  - Whenever something of value is not clearly owned by someone, people can use it without paying a price.

Rivalry and Excludability

- Many goods for which property rights are hard to define fall into the category of non-excludable goods.
- A good is **excludable** if people can be prevented from using it.
- In addition, a good is **rival in consumption** if one person's use of the good reduces other people's ability to use it.

Rivalry and Excludability

- **Public goods**: goods that are neither excludable nor rival in consumption.
  - National defense
  - Basic research
- **Common resources**: goods that are rival in consumption but not excludable[3].
  - Fish in the river
  - The environment
- **Club goods**: goods that are excludable but not rival in consumption.
  - Fire protection
  - Cable TV

[3] Wether a good is rival in consumption is often a matter of degree: when human activity has negligible impact on the environment, the environent is not rival in consumption

Types of Goods

Excludable?	Rival in consumption? Yes	Rival in consumption? No
Yes	Private Goods • Ice-cream cones • Clothing • Congested toll roads	Club Goods • Fire protection • Cable TV • Uncongested toll roads
No	Common Resources • Fish in the ocean • The environment • Congested nontoll roads	Public Goods • Tornado siren • National defense • Uncongested nontoll roads

The Demand Curve

Consider the market for a good. There is are N buyers. The demand of individual i for the good is

$$q_i = \alpha_i - \beta_i p \tag{1}$$

, or equivalently:

$$p_i = \frac{\alpha_i}{\beta_i} - \frac{1}{\beta_i} q \tag{2}$$

- (1) says that if the price of the good is p, individual i is going to purchase q_i amount of the good.
- (2) says that individual i's willingness to pay (WTP) for the q^{th} item of the good is p_i[4].

[4] Recall that a consumer's demand curve represents her willingness to pay for each additional item of the good. Or, equivalently, it represents the *marginal* benefit the consumer receives from the good.

The Demand Curve

- If the good is a private good (excludable and rival in consumption), the total demand for the good – the market demand curve – is

$$Q = \sum_{i=1}^{N} q_i = \sum_{i=1}^{N} \alpha_i - \left(\sum_{i=1}^{N} \beta_i \right) P \tag{3}$$

, or equivalently,

$$P = \frac{\sum_{i=1}^{N} \alpha_i}{\sum_{i=1}^{N} \beta_i} - \frac{1}{\sum_{i=1}^{N} \beta_i} Q \tag{4}$$

, where we use P and Q to denote market price and quantity.

The Demand Curve

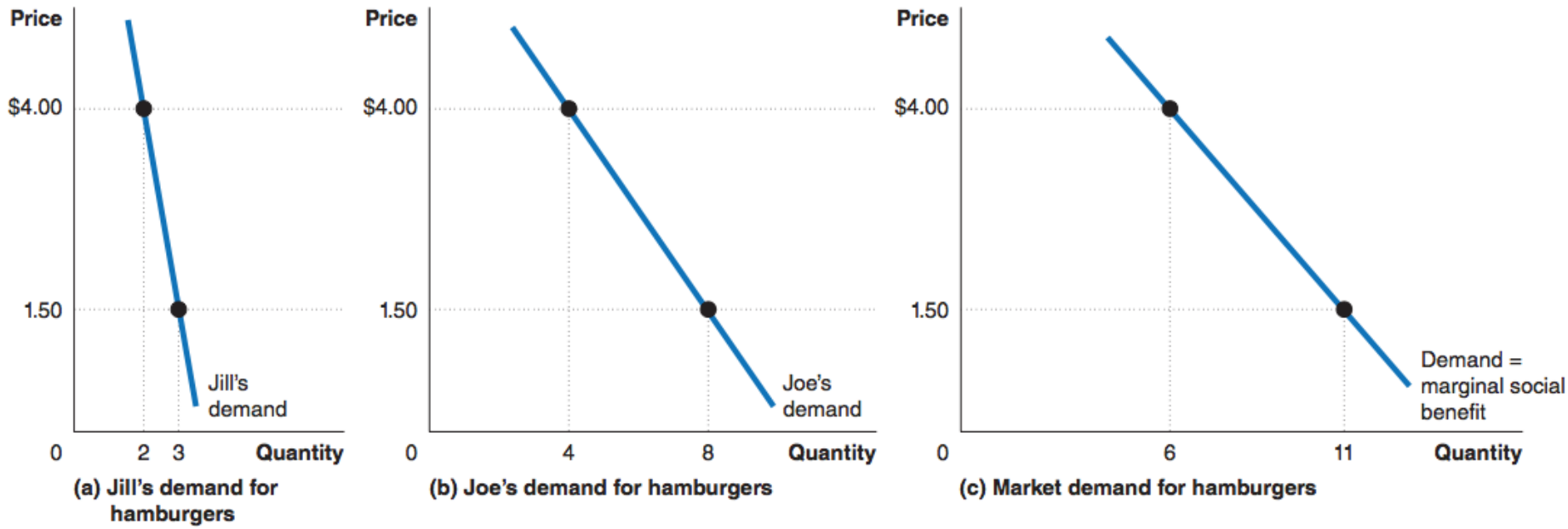
- If the good is a public good, the total WTP for the good is

$$P = \sum_{i=1}^{N} p_i = \sum_{i=1}^{N} \frac{\alpha_i}{\beta_i} - \left(\sum_{i=1}^{N} \frac{1}{\beta_i} \right) Q \tag{5}$$

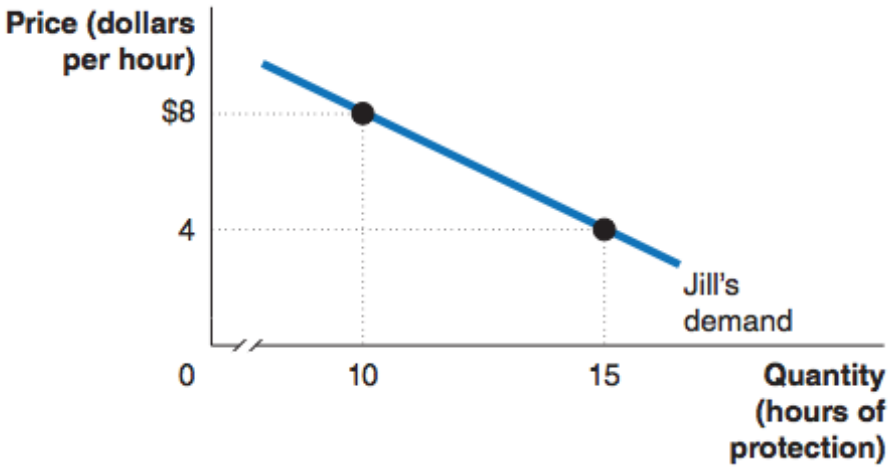
  - (5) is the marginal social benefit curve for the public good[5].

[5] Since the curve is derived by adding individual marginal benefits together at each quantity of the public good provided. For private goods, the market demand curve = the marginal social benefit curve.

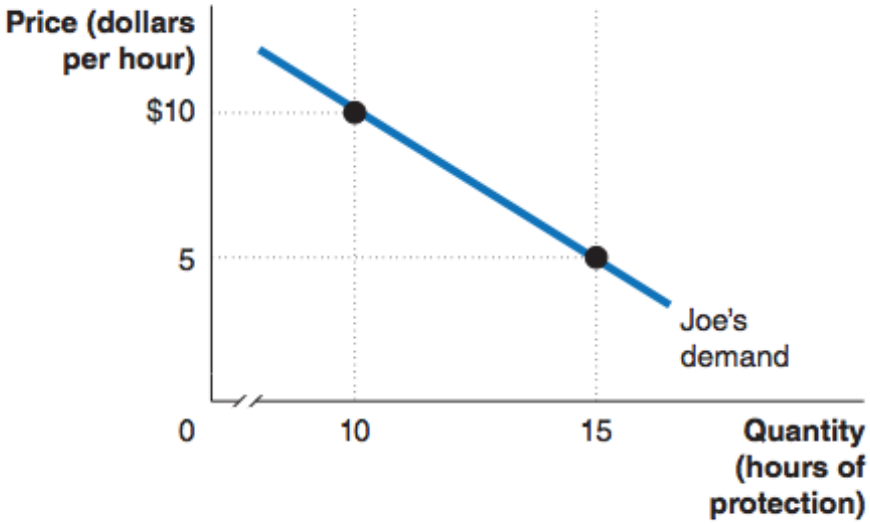
Demand for Private Good



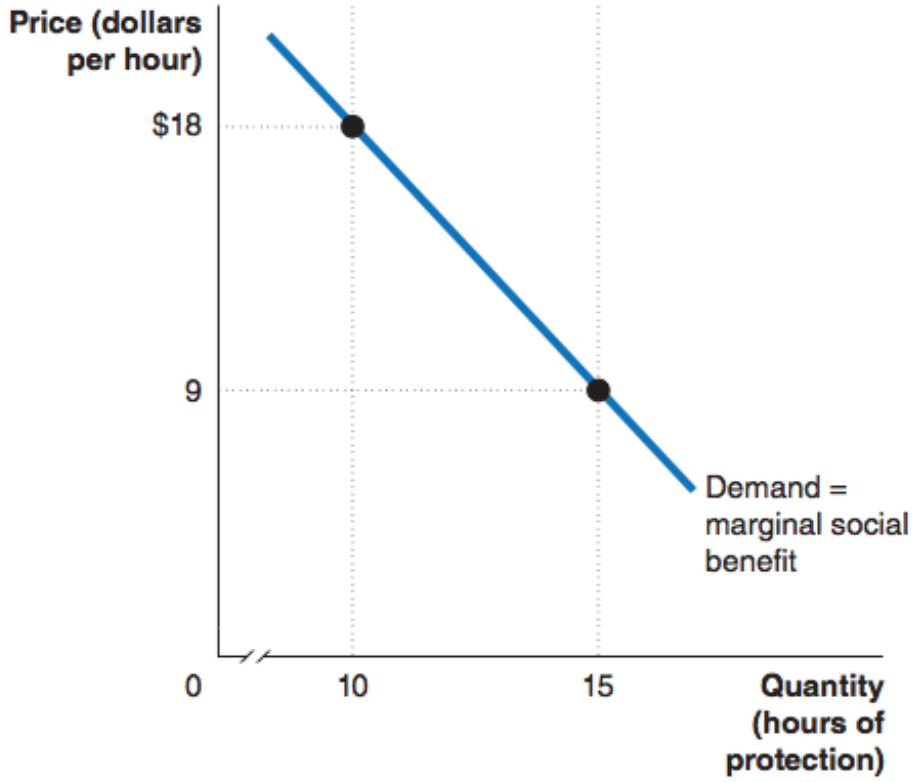
Demand for Public Good



(a) Jill's demand for security guard services

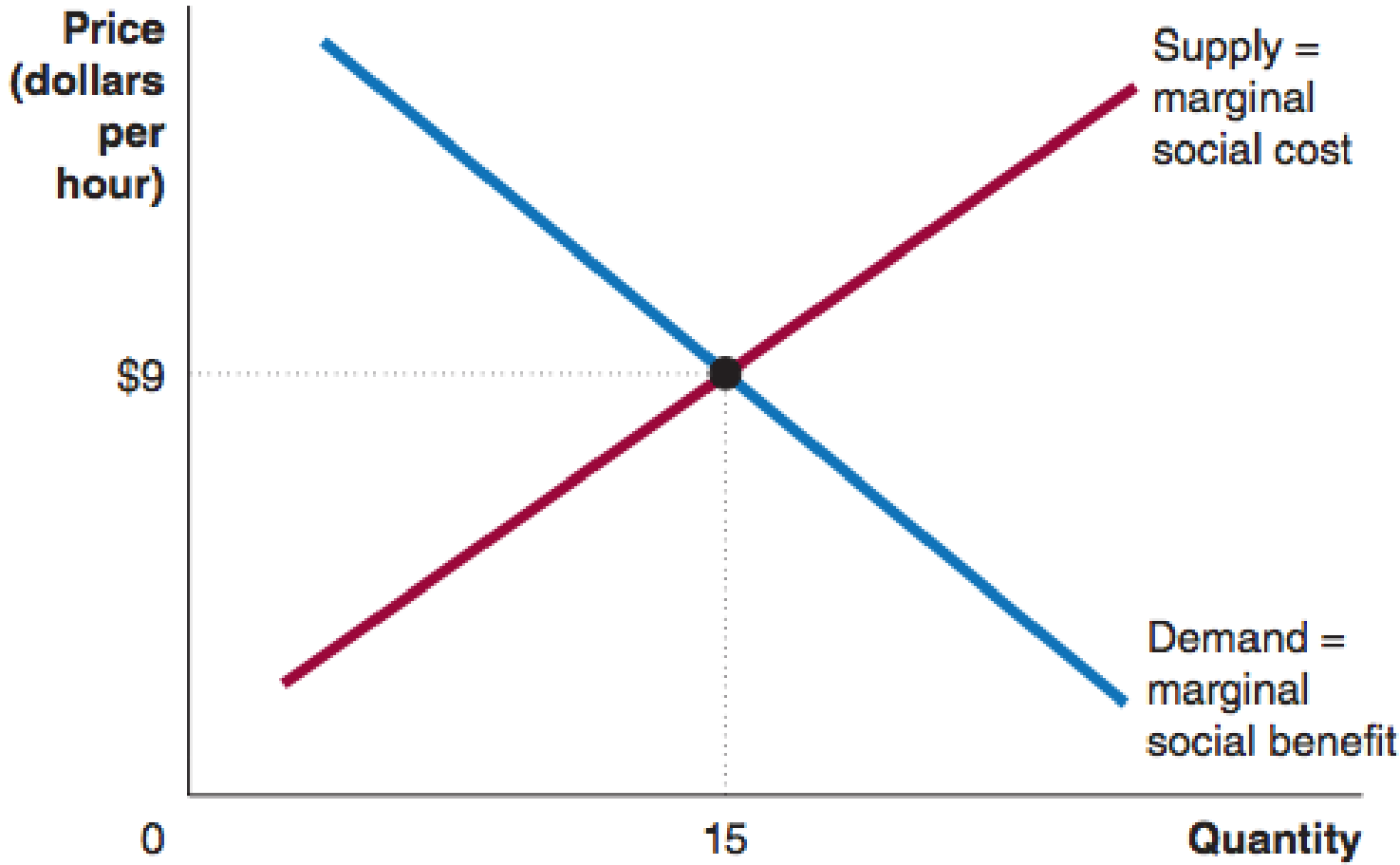


(b) Joe's demand for security guard services



(c) Total demand for security guard services

The Optimal Quantity of a Public Good



Club Good

- Because club goods are non-rival in consumption, their marginal social benefit curve is the same as that of public goods.
- Because club goods are excludable, there exists a market demand curve for club goods, which is

$$Q = \max\{q_1, \ldots, q_N\}$$

, where the maximum of individual quantity demanded is taken since club goods are non-rival in consumption.

Example 1

Adam and Eve live in the Eden. The gardening service in Eden is a public good. Adam and Eve's WTP for gardening are, respectively[a],

$$p_A = 200 - 2Q$$
$$p_E = 200 - Q$$

The marginal cost of providing gardening service is: $P = 100$.

Then the total WTP for gardening is:

$$P = 400 - 3Q$$

The sociall optimal level of gardening in Eden is: $Q^* = 100$

[a] As their respective demand curves show, Eve appreciates a beautiful garden more than Adam.

Example 2

Adam and Eve live in the Eden. Professor Snake teaches a course on Temptation in the University of Eden. The course is a club good: one must pay a tuition to attend Prof. Snake's lectures. Adam and Eve's WTP for Prof. Snake's lectures are, respectively[a],

$$p_A = 200 - 2Q$$
$$p_E = 200 - Q$$

The marginal cost of teaching for prof. Snake is: $P = 100$. The price Prof. Snake charges for attending his lectures is $P = 80$[b].

---

[a] As their respective demand curves show, Eve enjoys Prof. Snake's lectures more than Adam.

[b] Because he can.

Example 2 (Cont.)

The total WTP for Prof. Snake's lectures is:

$$P = 400 - 3Q$$

The sociall optimal level of lecturing Prof. Snake should provide is: $Q^{social} = 100$.

Example 2 (Cont.)

The market demand for Prof. Snake's lectures is:

$$P = 200 - Q$$

At $P = 80$,

- The number of lectures Adam will purchase is $q_A = 60$
- The number of lectures Eve will purchase is $q_E = 120$

Therefore the market quantity of lectures that will be produced is $Q^{market} = 120$[a]. Prof. Snake's profit is $80 \times 180 - 100 \times 120 = 2400$.

[a] i.e., Prof. Snake will produce 120 lectures. Adam will attend 60. Eve will attend 120.

Example 2 (Cont.)

What is the optimal price Prof. Snake should charge?

$$P^* = \arg\max_P \left\{ P \times \left[(200 - P) + \left(100 - \frac{1}{2} P \right) \right] - 100 \times (200 - P) \right\}$$
$$= \frac{400}{3}$$

Example 3

Adam and Eve live in the Eden. The apples in Eden are a private good. Adam and Eve's WTP for apples are, respectively[a],

$$p_A = 200 - 2Q$$
$$p_E = 200 - Q$$

The marginal cost of apples is: $P = 100$. There are many apple sellers so that seller-side of the market is competitive. As a result, each seller sells at her marginal cost, i.e. $P = 100$.

Then the market demand curve is:

$$Q = 300 - 1.5P$$

The equilibrium number of apples sold is: $Q^* = 150$

[a] As their respective demand curves show, Eve likes apples more than Adam.

Public Goods and Common Resources

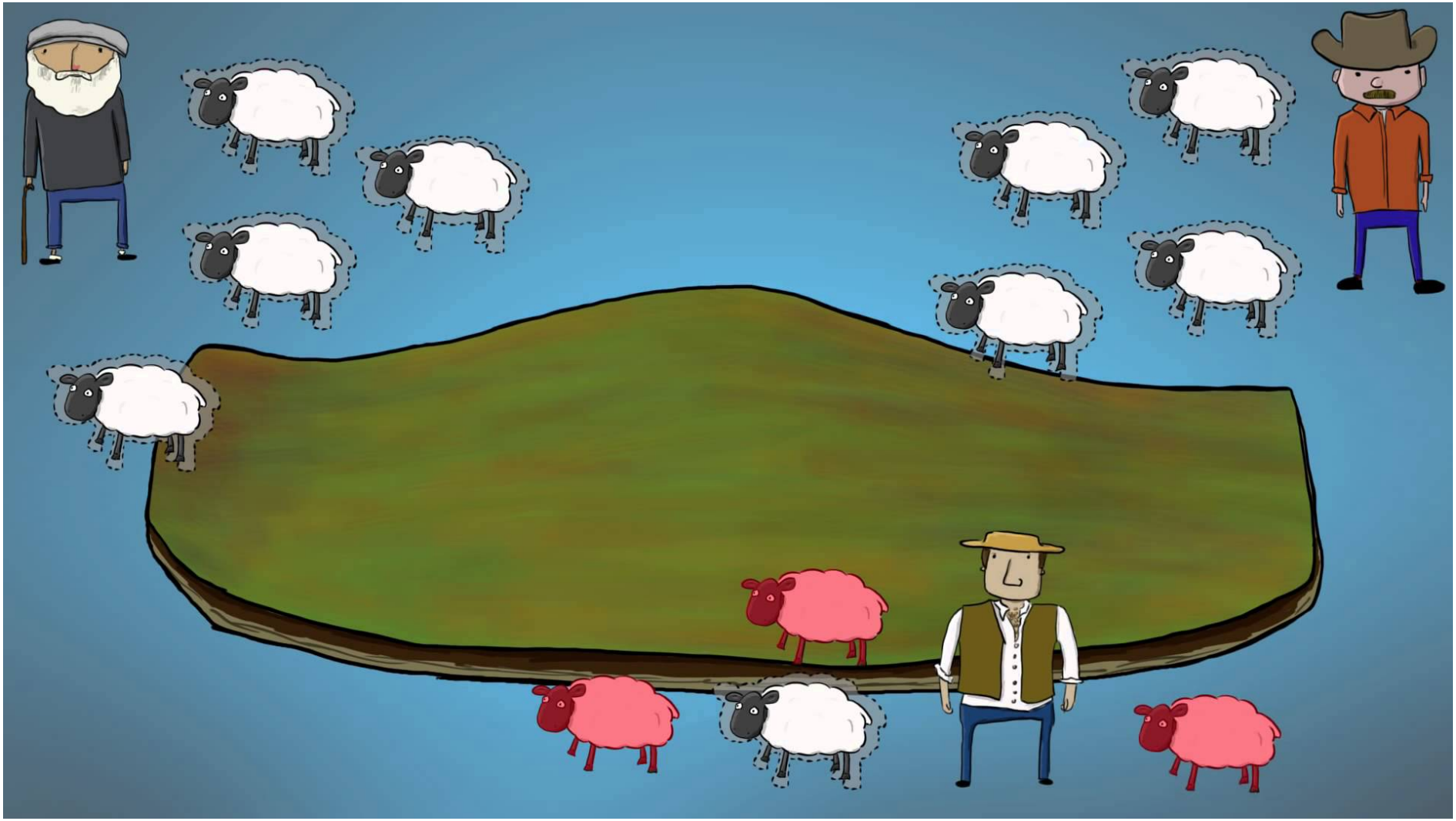
- Because of non-excludability, public goods tend to be under-provided[6] by the market.
  - The government doesn't know individual WTP for the public good and individuals may not have the incentive to reveal their WTP because of free-riding possibilities.
    - ★ **Free-riding**: benefiting from a good without paying for it.
- Like public goods, common resources are not excludable. In addition, because they are rival in consumption, common resources tend to be over-consumed[7].

[6] less than the socially optimal amount.
[7] more than the socially optimal amount.

The Tragedy of the Commons

- A medieval town where sheep graze on common land.
- As the town's wool industry becomes more prosperous, residents raise more and more sheep.
- The amount of land is fixed, as the number of sheep grows, the grass begins to disappear from overgrazing.
- Eventually the land becomes barren, people can no longer raise sheep, and the wool industry dies.
- The private incentives (using the land for free) outweigh the social incentives (using it carefully).

The Tragedy of the Commons



The Tragedy of the Commons

Policy remedies:

- Regulate the number of sheep in each family's flock
  - Command-and-control
- Tax sheep
  - Corrective tax
- Auction off a limited number of sheep-grazing permits
  - Cap-and-trade

The Importance of Property Rights

- The tragedy of the commons is a "tragedy" of social losses that emerges when property is "commonly" rather than privately owned.
- Recognizing the problem of externalities as a lack of well established property rights can encourage innovative government interventions.
- If it is feasible for the government to establish a system of property rights in resources that are not currently owned by anyone, such government interference can create additional markets that reduce the problem of externalities.

Private Solutions to Externalities

- Civil society organizations
  - e.g., the Sierra Club

Civil Society Organizations

Civil society organizations such as charities and other non-profit organizations arise as individuals try to use persuasion rather than the political process to address issues of concern that are not addressed in the market.

- relies on altruism and "enlightened self-interest."
- acts either *complementary to* or *in place of* the government in promoting social welfare.
- provides a decentralized way to address issues such as externality and poverty.
  - The government may not know what people want and care about.
  - Competition among charities could in theory promote efficiency.

Civil Society Organizations

- Suppose a local government is making funding decisions regarding the following projects:

  1. preserve an endangered species in the local river
  2. preserve a historical building
  3. fund a local school

  Which one should the government fund and how much?

- Instead of relying on the government, people can donate to their favorite charities. The money received by each charity is thus an "equilibrium outcome" and reflects how much each cause is valued by the local people.

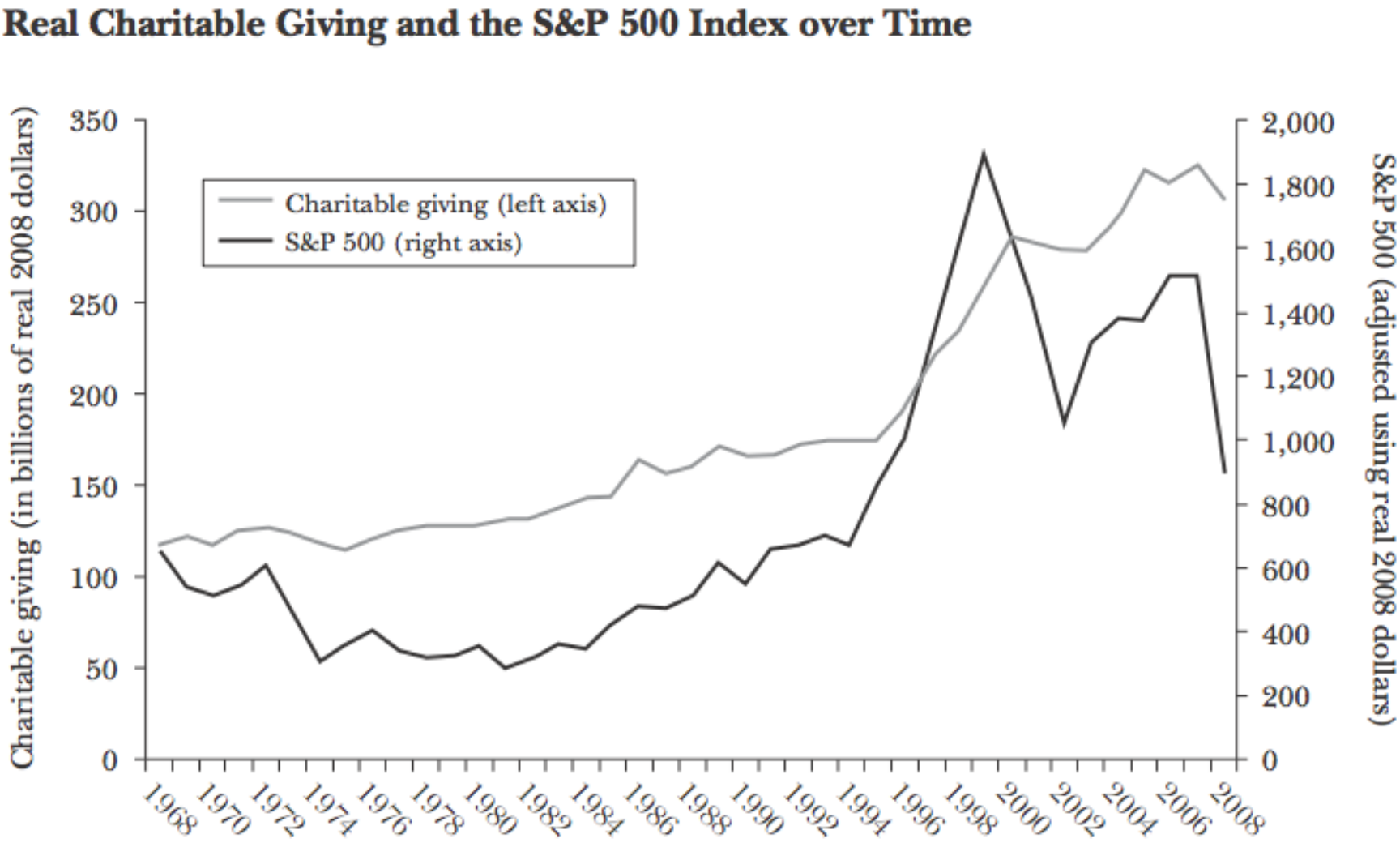
Civil Society Organizations

- In raising charitable donations, civil society organizations have to overcome the **free-rider problem**.
  - We want other people to donate money to solve the issues we want to solve.
- In addition, government spending could *crowd out* private spending on charitable causes.
  - For example, before the 1930s, charities in the U.S. used to focus on providing assistance to the poor (in the U.S.), but have largely shifted to other causes since the New Deal.

Civil Society Organizations

- The government can encourage civil society organizations by allowing an income tax deduction for charitable donations and granting tax exempt status to charities and other non-profits.
  - Thus, instead of designing explicit taxes and subsidies to correct externalities, the government can subsidize the efforts of civil society organizations in finding non-market, non-governmental solutions.
- However, the welfare effects of civil society organizations remain to be better evaluated.
  - It is difficult to say whether the quantity of charitable contributions is too low or too high; whether resources are spent on the "correct" mix of products; or whether the current tax incentives are too big or too small.

Charitable Giving



Source: List (2011)

Charitable Giving

Rank	Name/(state)	Assets	As of Fiscal Year End Date
1.	Bill & Melinda Gates Foundation (WA)	$41,310,207,525	12/31/2013
2.	Ford Foundation (NY)	12,259,961,589	12/31/2013
3.	J. Paul Getty Trust (CA)	11,110,918,337	06/30/2013
4.	The Robert Wood Johnson Foundation (NJ)	10,173,403,442	12/31/2013
5.	The William and Flora Hewlett Foundation (CA)	9,042,503,000	12/31/2014

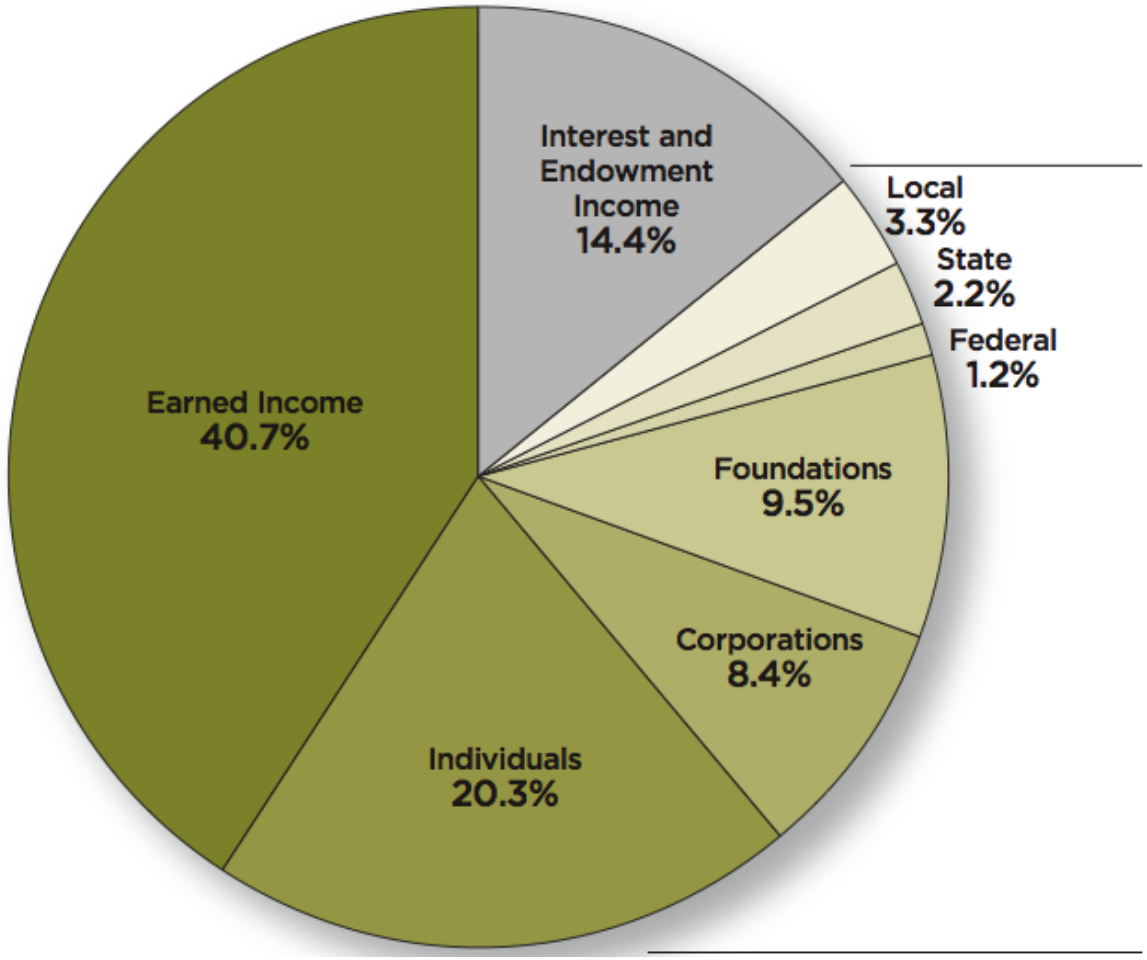
Top U.S. Foundations by Asset Size. Source: Foundation Center

Question

Should the government fund the arts and how?

Picasso, Guernica

Arts Funding



Revenue sources of non-profit performing arts groups and museums in the U.S.
Source: NEA (2012)

Arts Funding

	Budget per capita (U.S. dollars)	Data year
Arts Council of Wales	$17.80	2012/2013
Arts Council (Ireland)	$16.96	2012
Scottish Arts Council	$14.52	2009/2010
Arts Council of England	$13.54	2010
Arts Council of Northern Ireland	$12.36	2011/2012
Australian Council	$8.16	2010/2011
Canada Council for the Arts	$5.19	2011
Creative New Zealand	$2.98	2009/2010
National Endowment for the Arts	$0.47	2012

Government funding of arts councils and agencies by selected countries.
Source: NEA (2012)

Government, Markets, and Civil Society

All three types of institutions — government, markets, and civil society, face obstacles in achieving efficient outcomes in the presence of externalities.

- Markets tend to underproduce in the presence of positive externalities and overproduce in the presence of negative externalities.
- Governments face difficulties in collecting the information necessary for designing optimal taxes, subsidies, and other policies.
- Civil society efforts that rely on the voluntary engagement of non-market participants face the free-rider problem.

Private Solutions to Externalities

- Civil society organizations
- Private Contracts

Smaller Externalities and the Coase Theorem

- We have been focusing on externalities that affect many people – such as pollution and congestion. But we encounter many smaller externalities in our daily lives.
  - loud music in the room next to yours
  - baby crying in concert halls
- Externalities are everywhere that people operate within close proximity to one another.

The Coase Theorem

Theorem (The Coase Theorem)

In the presence of sufficiently low transactions costs, the efficient outcome will arise in the presence of externalities so long as property rights are sufficiently clear.

- **Transactions Costs**: the costs parties incur in the process of agreeing to and following through on a bargain.
  - One type of transaction cost is **coordination problem**: if the number of parties is large, coordinating them can be difficult and costly.

Coase Theorem: Example

Granny Dancing and Noise Pollution

Coase Theorem: Case 1

- **Granny has the right to dance**
  - Benefit of dancing to granny = \$500
  - Noise cost to me = \$800
- The socially efficient outcome:
  - Granny should stop dancing
- Private outcome:
  - I pay granny \$600 not to dance. Both granny and me are better off.
- Private outcome = efficient outcome

Coase Theorem: Case 2

- **Granny has the right to dance**
  - Benefit of dancing to granny = \$1000
  - Noise cost to me = \$800
- The socially efficient outcome:
  - Granny should keep dancing
- Private outcome:
  - I'm not willing to pay more than \$800
  - Granny is not willing to accept less than \$1000
  - So granny keeps dancing
- Private outcome = efficient outcome

Coase Theorem: Case 3

- **I have the right to peace and quiet**
  - Benefit of dancing to granny = \$800
  - Noise cost to me = \$500
- The socially efficient outcome:
  - Granny should keep dancing
- Private outcome:
  - Granny pays me \$600 to put up with her dancing
- The private market achieves the efficient outcome regardless of the initial distribution of rights.

Smaller Externalities and the Coase Theorem

- The Coase theorem says it is essential that property rights be clearly defined in cases when there are externalities, but it is not essential how the rights are initially distributed.
- Recall our discussion of how the problem of externalities arise due to a failure of markets to exist, which is in turn due to a lack of well established property rights.

Smaller Externalities and the Coase Theorem

- This is essentially the insight of Coase, except that Coase does not insist on the existence of competitive markets. Rather, the Coase theorem says that when transaction costs are low, there is no need for the government to do anything (other than defining and protecting property rights) – private bargaining will achieve the efficient outcome even in the presence of externalities.
  - Thus, we might not need to worry about every-day externalities that affect small numbers of people, as transactions costs tend to be low in these cases.

Acknowledgement

Part of this lecture is adapted from the following sources:

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