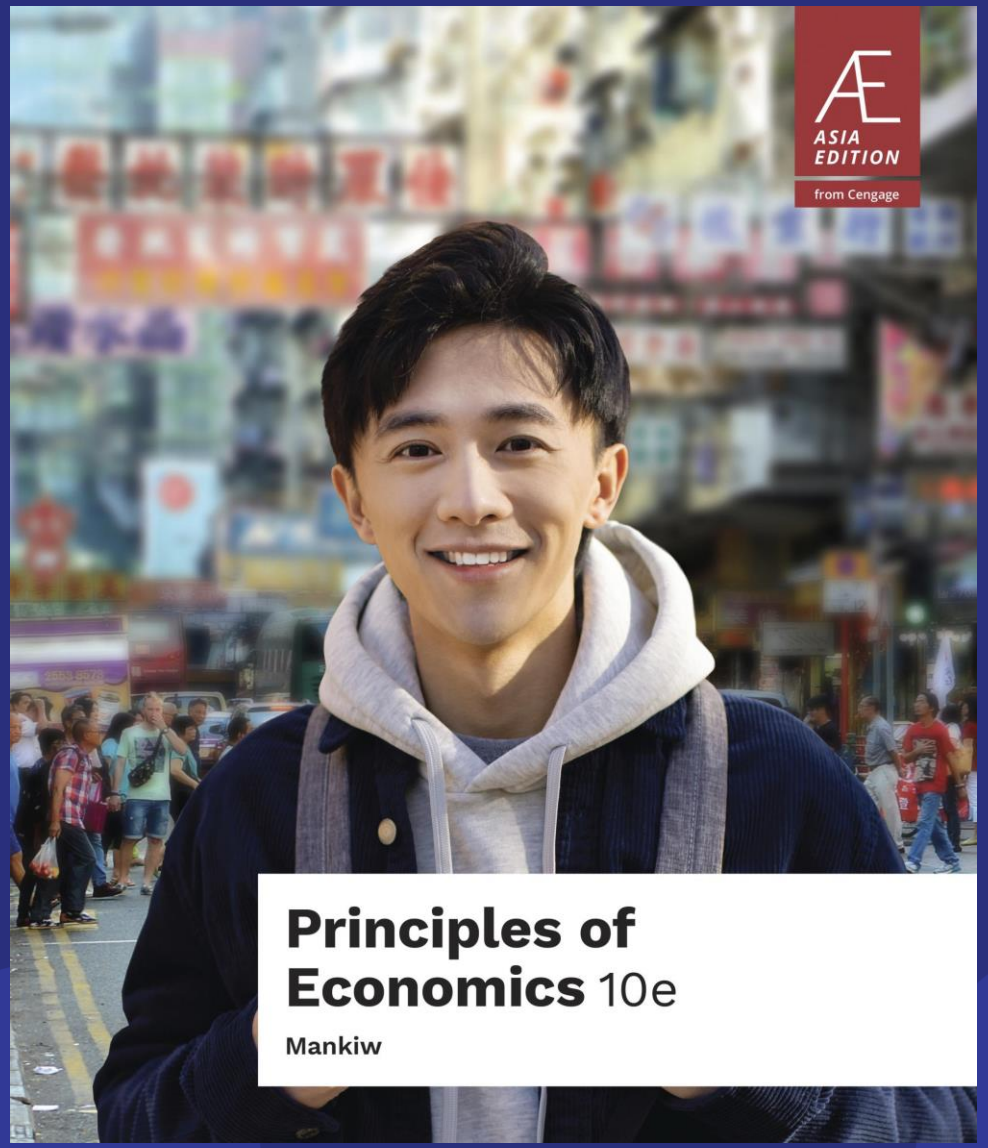


Principles of Economics, 10e

Chapter 10: Externalities

Chapter Objectives (1 of 2)

By the end of this chapter, you should be able to:

- Describe the differences between positive and negative externalities.
- Determine how negative externalities impact market efficiency.
- Explain the impact of regulation on negative externalities.
- Explain the impact of taxes on negative externalities.
- Determine how positive externalities impact market efficiency.
- Explain the impact of subsidies on positive externalities.
- Explain the impact of tradable permits on negative externalities.

Chapter Objectives (2 of 2)

- Explain how private solutions can correct for negative externalities.
- Explain the application of the Coase theorem, given a scenario.

10-1

Externalities and Market Inefficiency

Externalities (1 of 3)

- “Governments can sometimes improve market outcomes”
  - One of the Ten Principles of Economics
- **Externality***
  - The uncompensated impact of one person’s actions on the well-being of a bystander
- Negative externality: Impact is adverse
- Positive externality: Impact is beneficial

*Words accompanied by an asterisk are key terms from the chapter.

Externalities (2 of 3)

- Examples of negative externality
  - Pollution
  - Noise
  - Smoking
- Examples of positive externality
  - Education
  - Research
  - Technology spillovers

Externalities (3 of 3)

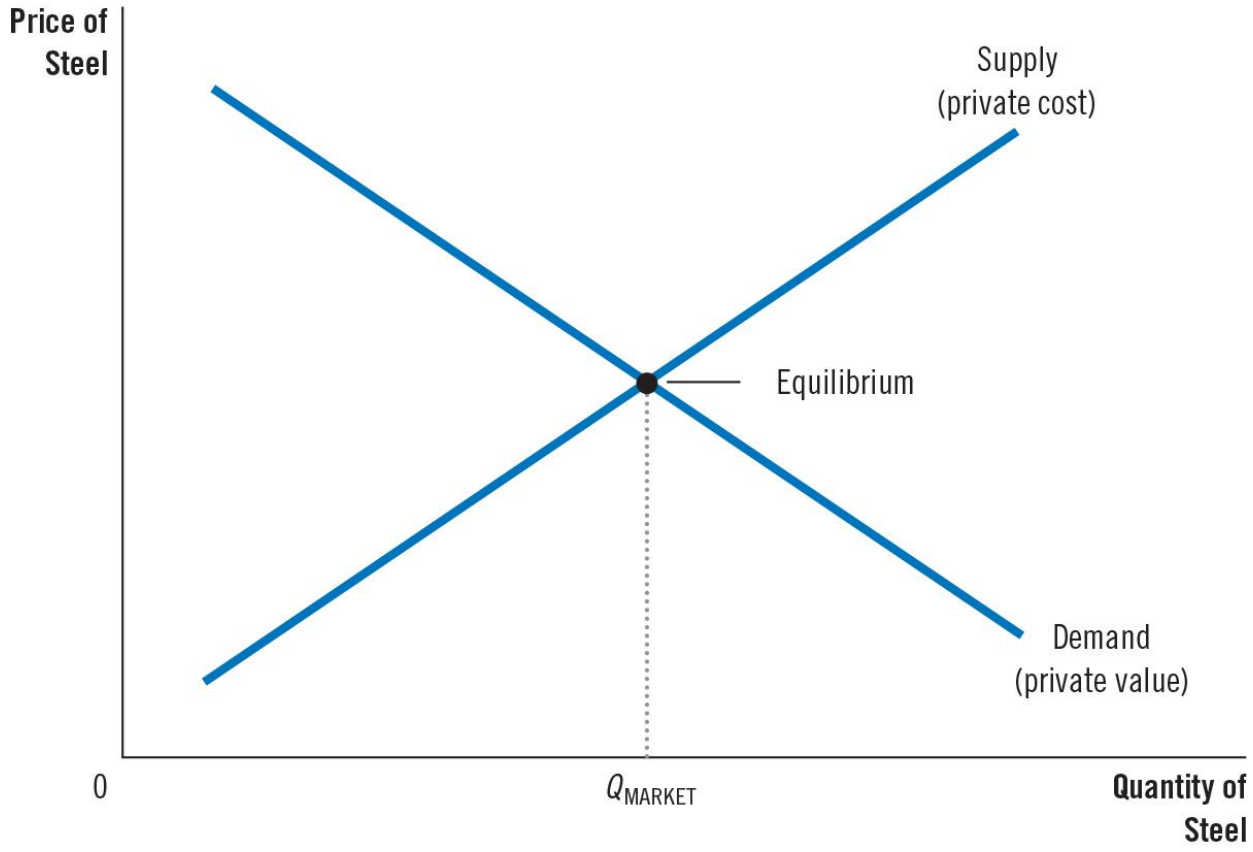
- When externalities are present, society's interest in a market outcome includes the well-being of bystanders
- The market equilibrium is not efficient
    - Societal well-being is not maximized and government policies can potentially correct the market failure

Welfare Economics: A Recap

- Supply and demand curves contain important information about costs and benefits
  - Demand curve reflects the *value* to consumers
  - Supply curve reflects the *cost* to producers
  - Market equilibrium maximizes sum of producer and consumer surplus
- The market allocates resources in a way that maximizes the total value to the consumers minus the total costs to the producers

Figure 1 The Market for Steel

- The demand curve reflects the value to buyers, and the supply curve reflects the costs of sellers.
- The equilibrium quantity, Q_{MARKET}, maximizes the total value to buyers minus the total costs of sellers.
- In the absence of externalities, the market equilibrium is efficient.

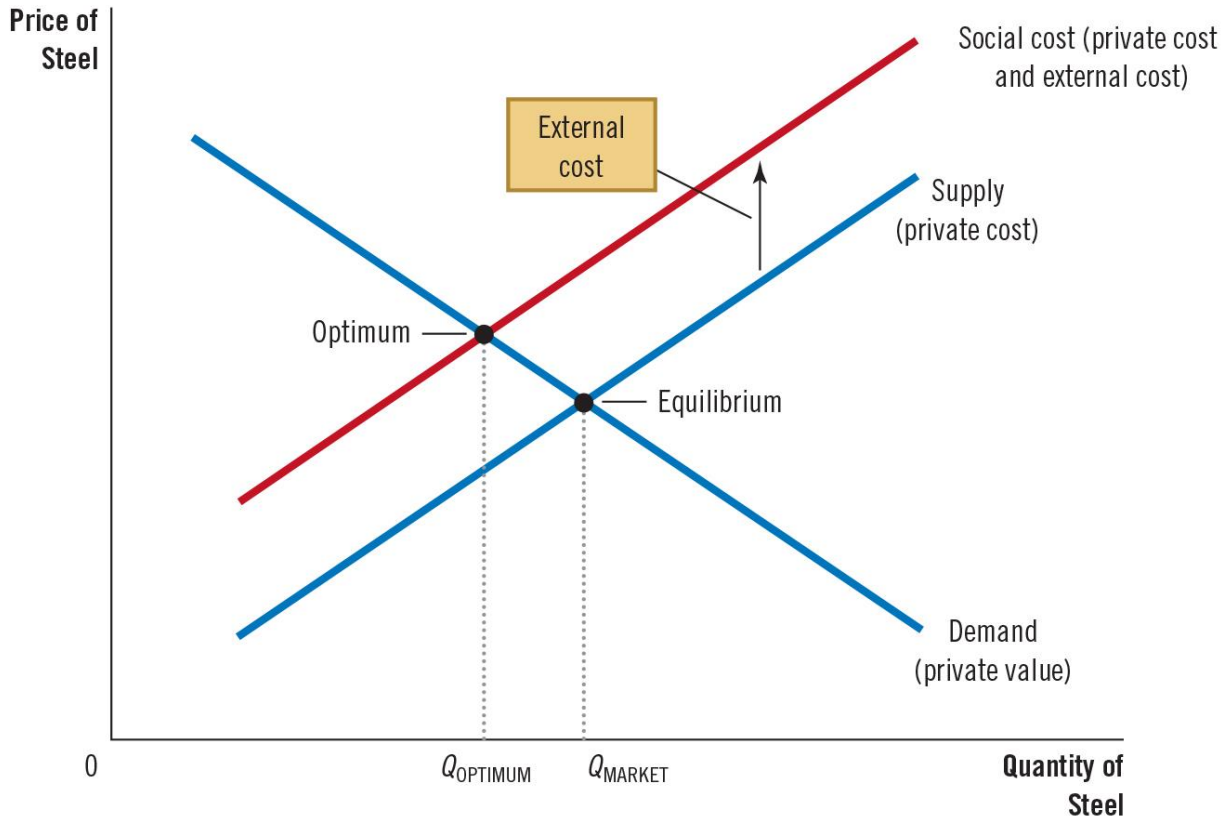


Negative Externalities

- Cost to society exceeds the cost to the good producers
- Social cost
  - Private costs of the producers
  - Plus the costs to those bystanders harmed by the negative externality
  - Social-cost curve is above the supply curve
    - Takes into account the external costs imposed on society

Figure 2 Pollution and the Social Optimum

- In the presence of a negative externality, such as pollution, the social cost of the good exceeds the private cost.
- The optimal quantity, $Q_{OPTIMUM}$, is therefore smaller than the equilibrium quantity, Q_{MARKET}.



Internalizing the Externality

- **Internalizing the externality***
  - Altering incentives so that people take into account the external effects of their actions
- If market participants pay social costs (tax on producers)
  - Tax shifts supply curve upward by the size of the tax
  - New supply curve would coincide with the social-cost curve
  - Market equilibrium = Socially optimal quantity

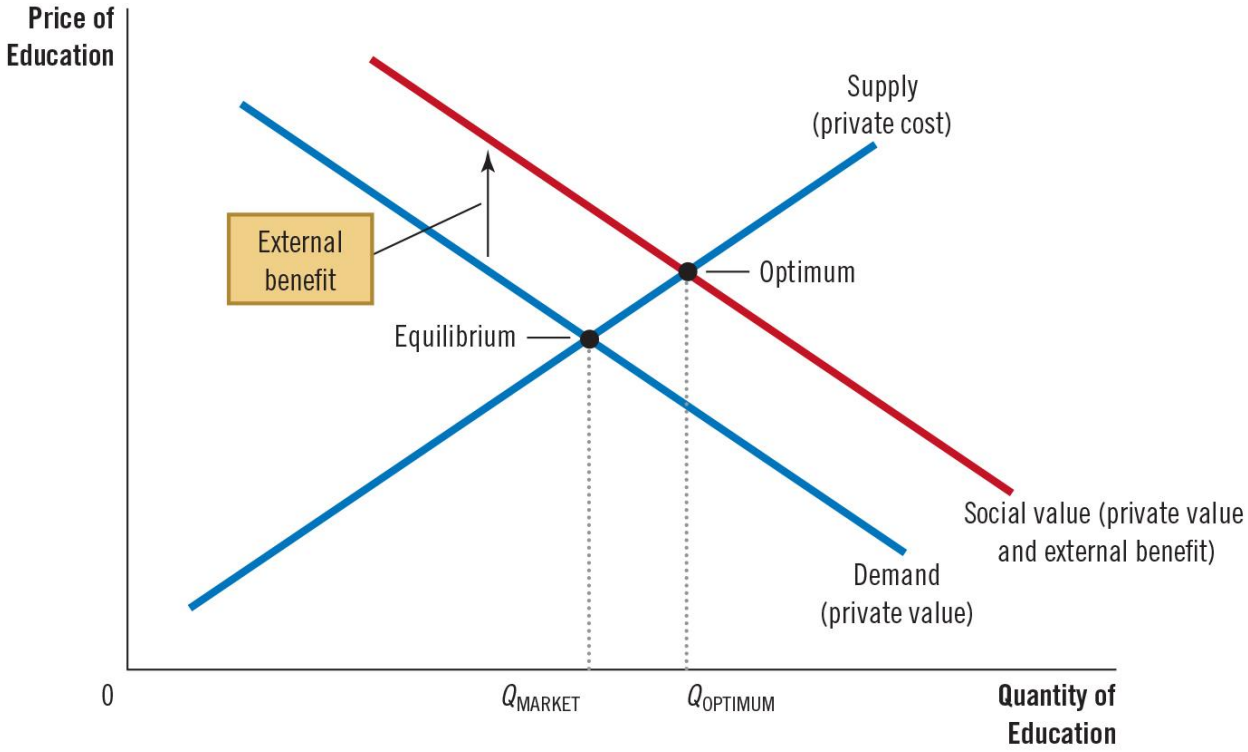
*Words accompanied by an asterisk are key terms from the chapter.

Positive Externalities

- With a positive externality
  - Demand curve does not reflect the value to society of the good
  - Social-value curve lies above the demand curve
  - Socially optimal quantity exceeds the market equilibrium quantity
- Government can correct market failure
  - Internalize the externality
  - Subsidy

Figure 3 Education and the Social Optimum

- In the presence of a positive externality, the social value of the good exceeds the private value.
- The optimal quantity, $Q_{OPTIMUM}$, is therefore larger than the equilibrium quantity, Q_{MARKET}.



Effect of Externalities Summary

- Negative externalities
  - Market quantity > Socially desirable
- Positive externalities
  - Market quantity < Socially desirable
- To remedy the problem, “internalize the externality”
  - Tax goods with negative externalities
  - Subsidize goods with positive externalities

10-2

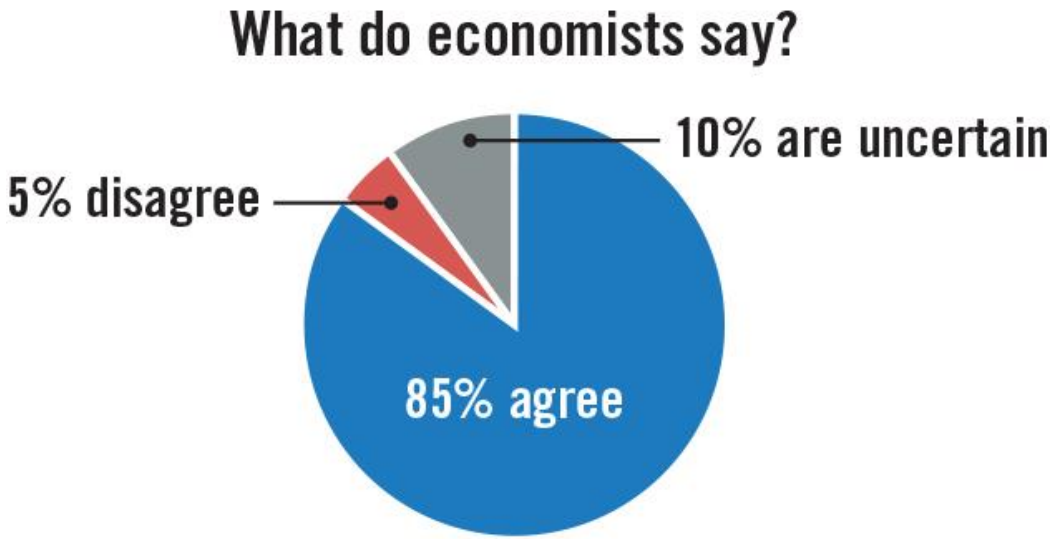
Public Policies toward Externalities

Command-and-Control Policies: Regulation

- Government can remedy an externality by either requiring or forbidding certain behaviors
- For example, environmental regulations
  - EPA (Environmental Protection Agency) may dictate the maximum level of pollution that a factory may emit or require firms to adopt a particular technology to reduce emissions
  - To design good rules, the government regulators need to know the details about specific industries and about the alternative technologies that they could adopt
  - Yet profit-seeking industries often have an incentive to conceal adverse health effects and exaggerate the cost of moving toward cleaner technologies

Ask the Experts: Covid Vaccines

"Given the positive externalities from vaccination, an effective Covid-19 vaccine should be mandatory for every US resident (except those with health exceptions, such as infants and people with compromised immunity) with the cost covered by the federal government."



Source: IGM Economic Experts Panel, June 23, 2020.

Market-Based Policy 1: Corrective Taxes and Subsidies (1 of 2)

- Provide incentives so that private decision makers will choose to solve the problem on their own
- Taxing activities with negative externalities (Pigovian taxes)
  - Ideal corrective tax = External cost
- Subsidizing activities with positive externalities
  - Ideal corrective subsidy = External benefit

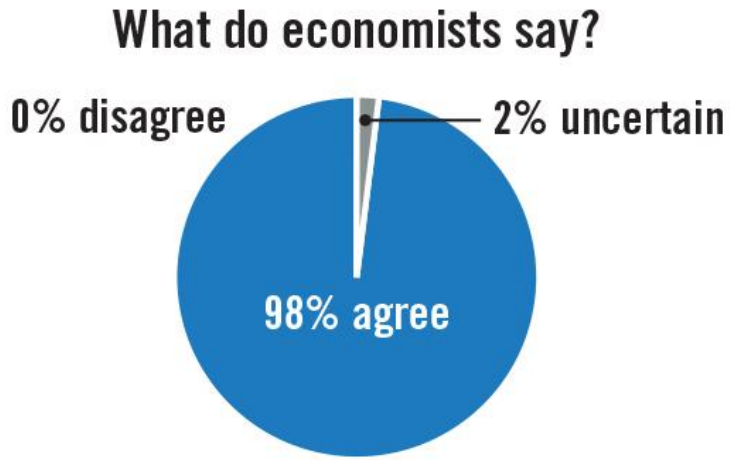
Market-Based Policy 1: Corrective Taxes and Subsidies (2 of 2)

- Economists usually prefer corrective taxes to regulations as a way to deal with pollution because they can reduce pollution at a lower cost to society
- **Corrective taxes***
  - Align private incentives with society's interests
  - Move the allocation of resources closer to social optimum
  - Raise government revenue
  - Enhance economic efficiency

*Words accompanied by an asterisk are key terms from the chapter.

Ask the Experts: Carbon Taxes—A

"The Brookings Institution recently described a U.S. Carbon tax of $20 per ton, increasing at 4 percent per year, which would raise an estimated $150 billion per year in federal revenues over the next decade. Given the negative externalities created by carbon dioxide emissions, a federal carbon tax at this rate would involve fewer harmful net distortions to the U.S. economy than a tax increase that generated the same revenue by raising marginal tax rates on labor income across the board."



Source: IGM Economic Experts Panel, December 4, 2012, December 20, 2011, and November 13, 2018.

Market-Based Policy 2: Tradable Pollution Permits (1 of 2)

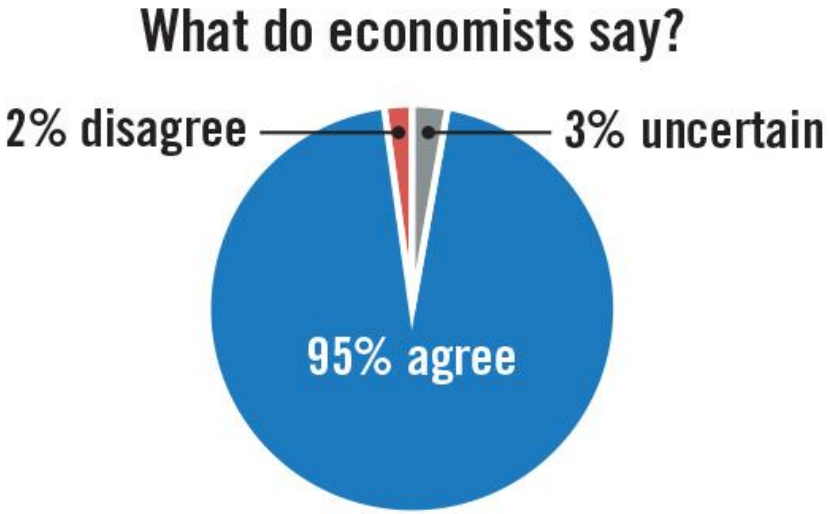
- Tradable pollution permits
  - Voluntary transfer of the right to pollute from one firm to another
  - New scarce resource: pollution permits
  - Market to trade permits develops
  - Firm’s willingness to pay depends on its cost of reducing pollution

Market-Based Policy 2: Tradable Pollution Permits (2 of 2)

- Advantage of a market for pollution permits
  - Firms that can reduce pollution at a low cost will sell whatever permits they get
  - Firms that can reduce pollution at a high cost will buy whatever permits they need
- Final allocation will be efficient regardless of initial allocation

Ask the Experts: Carbon Taxes—B

"A tax on the carbon content of fuels would be a less expensive way to reduce carbon dioxide emissions than would a collection of policies such as 'corporate average fuel economy' requirements for automobiles."



Source: IGM Economic Experts Panel, December 4, 2012, December 20, 2011, and November 13, 2018.

Active Learning 1: Reducing Pollution

Tiana's Paper Mill and Jordan's Tire Factory are both polluting the Blue River with 100 tons of green glowing glop per month (each).

Goal

- Reduce total green glowing glop pollution to 140 tons/month

Cost of reducing pollution

- $100/ton for Tiana's Paper Mill
- $200/ton for Jordan's Tire Factory

Which is more efficient, regulation or tradable pollution permits? Compute the cost of achieving the goal if Tiana's Paper Mill uses 40 permits and sells 30 to Jordan's Tire Factory for $150 each.

Active Learning 1: Answers

Policy option 1: Regulation

- Each firm must cut its pollution by 30 tons
- Cost to Tiana: 30 tons × ($100/ton) = $3,000
- Cost to Jordan: 30 tons × ($200/ton) = $6,000
- Total cost of reducing pollution = $9,000 per month

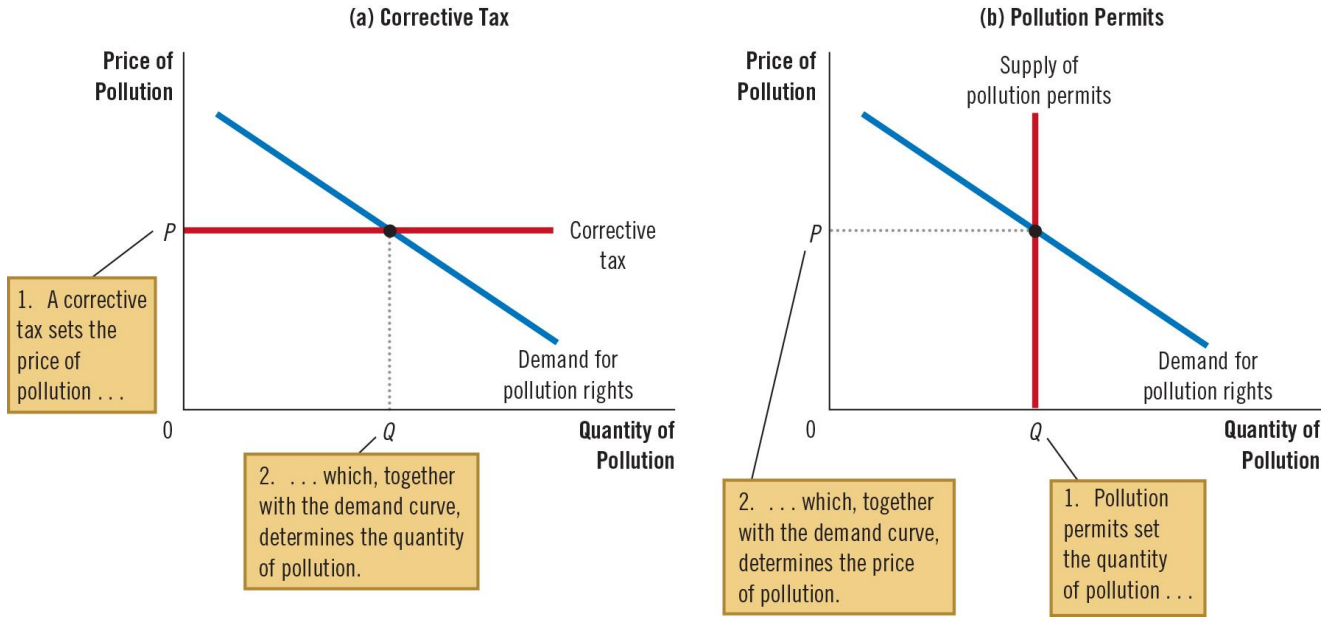
Policy option 2: Tradable pollution permits

- The government issues 140 permits
  - Gives 70 permits to each firm
  - Establish a market for trading permits
  - Tiana must clean 100 – 40 = 60 tons
- Cost to Tiana: $6,000 – $4,500 = $1,500
- Cost to Jordan: 30 × $150 = $4,500
- Total cost of reducing pollution

  = $1,500 + $4,500 = $6,000 per month

Figure 4 The Equivalence of Corrective Taxes and Pollution Permits

In panel (a), the EPA sets a price on pollution by levying a corrective tax, and the demand curve determines the quantity of pollution. In panel (b), the EPA limits the quantity of pollution by limiting the number of pollution permits, and the demand curve determines the price of pollution. The price and quantity of pollution are the same in the two cases.



Pollution Permits or Corrective Taxes?

- Firms pay for their pollution
  - Corrective taxes: pay a tax to the government
    - Firms can pollute as much as they want by paying the tax
  - Pollution permits: pay to buy permits
  - Internalize the externality of pollution

Objections to the Economic Analysis of Pollution (1 of 2)

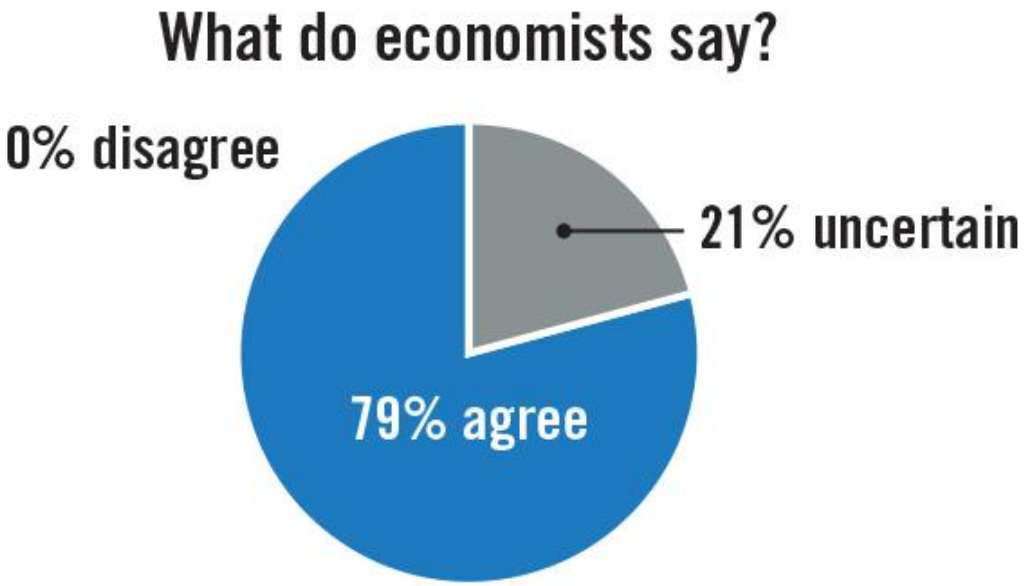
- "We cannot give anyone the option of polluting for a fee"
  - Late Senator Edmund Muskie
- People face trade-offs
  - Eliminating all pollution is impossible
  - Value of environmental measures must be compared with their *opportunity cost*

Objections to the Economic Analysis of Pollution (2 of 2)

- Clean environment is a *normal good*
  - Positive income elasticity
  - Rich countries can afford a cleaner environment, have more rigorous environmental protection
- Clean air and clean water obey the *law of demand*
  - The lower the price of environmental protection, the more the public will want it
  - Using pollution permits and corrective taxes reduces the cost of environmental protection

Ask the Experts: Carbon Taxes—C

"Carbon taxes are a better way to implement climate policy than cap-and-trade."



Source: IGM Economic Experts Panel, December 4, 2012, December 20, 2011, and November 13, 2018.

10-3

Private Solutions to Externalities

The Types of Private Solutions

- Moral codes and social sanctions
- Charities
- Self-interest of the relevant parties
  - Integrating different types of businesses
  - Negotiating a contract

The Coase Theorem

- **Coase theorem* (by Ronald Coase)**
  - If private parties can bargain *without cost* over the allocation of resources, they can solve the problem of externalities on their own
- *Whatever the initial distribution of rights*
  - Interested parties can reach a bargain
  - Everyone is better off
  - Outcome is efficient

*Words accompanied by an asterisk are key terms from the chapter.

The Coase Theorem: Example

- Emily owns a dog (Clifford) who barks and disturbs Horace (neighbor)
- Assume that Emily has the legal right to keep a barking dog
  - Emily can keep Clifford unless Horace pays her enough to induce her to give up the dog voluntarily
  - By bargaining over the price, Emily and Horace can always reach the efficient outcome
- Having this right works to Horace's advantage (Horace can legally compel Emily to get rid of the dog) will not change the outcome
- The distribution of rights only determines *who pays whom* in the final bargain

Why Private Solutions Do Not Always Work

- **Transaction costs***
  - Costs that parties incur in the process of agreeing to and following through on a bargain
- Bargaining simply breaks down
- Coordination problems
  - Large number of interested parties
  - Coordinating everyone is costly

*Words accompanied by an asterisk are key terms from the chapter.

10-4

Conclusion

Conclusion

- The invisible hand of the marketplace may fail to allocate resources efficiently
- When people cannot solve the problem of externalities privately, government intervenes
- Government can require market participants to bear the full costs of their actions by internalizing the externality
- Market forces, properly redirected, are often the best remedy for market failure

Think-Pair-Share Activity

Your father is reading your parents' property tax bill. On the property tax bill, there is a deduction if the property owner has done anything to beautify his property. For example, if your parents spent $2,000 on landscaping, they can reduce their tax bill by 0.50 × $2,000 = $1,000 so that the true cost of the landscaping was only $1,000.

Your father announces, "This is an outrage. If someone wants to improve his house, it is no one's business but his own. I remember some of my college economics and I know that taxes and subsidies are always inefficient."

A. What is the city government trying to subsidize with this tax break?

B. What is the externality that this subsidy is trying to internalize?

C. Although taxes and subsidies usually create inefficiencies, are taxes and subsidies always inefficient? Why or why not?

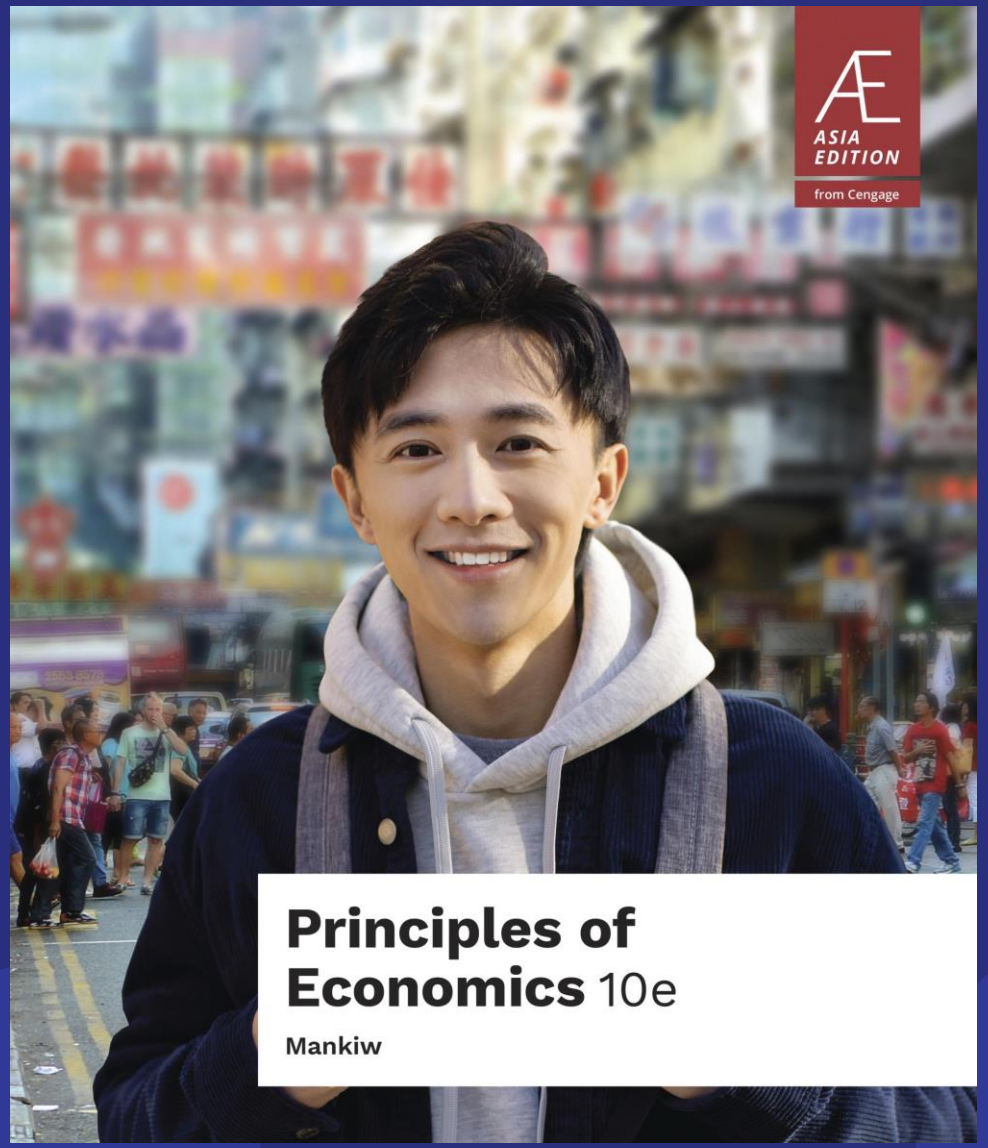
Self-Assessment

- What are some of the ways that the problems caused by externalities can be solved without government intervention?

Summary

Click the link to review the objectives for this presentation.

Link to Objectives



Principles of Economics, 10e

Chapter 11: Public Goods and Common Resources

Chapter Objectives (1 of 2)

By the end of this chapter, you should be able to:

- Examine the implications of excludability and rivalry on the market for a good.
- Identify a good as a public good, private good, common resource, or club good in a given scenario.
- Determine whether a good is excludable in consumption.
- Determine whether a good is rival in consumption.
- Explain the presence of the free-rider problem, given an example of a public good.
- Explain why private firms find it unprofitable to produce public goods.

Chapter Objectives (2 of 2)

- Name a problem associated with using cost-benefit analysis to determine the optimal quantity of a public good.
- Explain why consumers tend to overuse common resources, resulting in the tragedy of the commons.
- Explain the role of property rights on achieving market efficiency.

11-1

The Different Kinds of Goods

Introduction

- We consume many goods without paying
  - Rivers, mountains, beaches, lakes, playgrounds, parks
- Without prices, private markets cannot ensure that such goods are made available and used correctly for the maximum benefit of society as a whole
- How well do markets work in providing people with what they want? The answer depends on the good being considered

Characteristics of Goods

- **Excludability***
  - Property of a good whereby a person can be prevented from using it
- **Rivalry in consumption***
  - Property of a good whereby one person's use diminishes other people's use

*Words accompanied by an asterisk are key terms from the chapter.

Types of Goods (1 of 2)

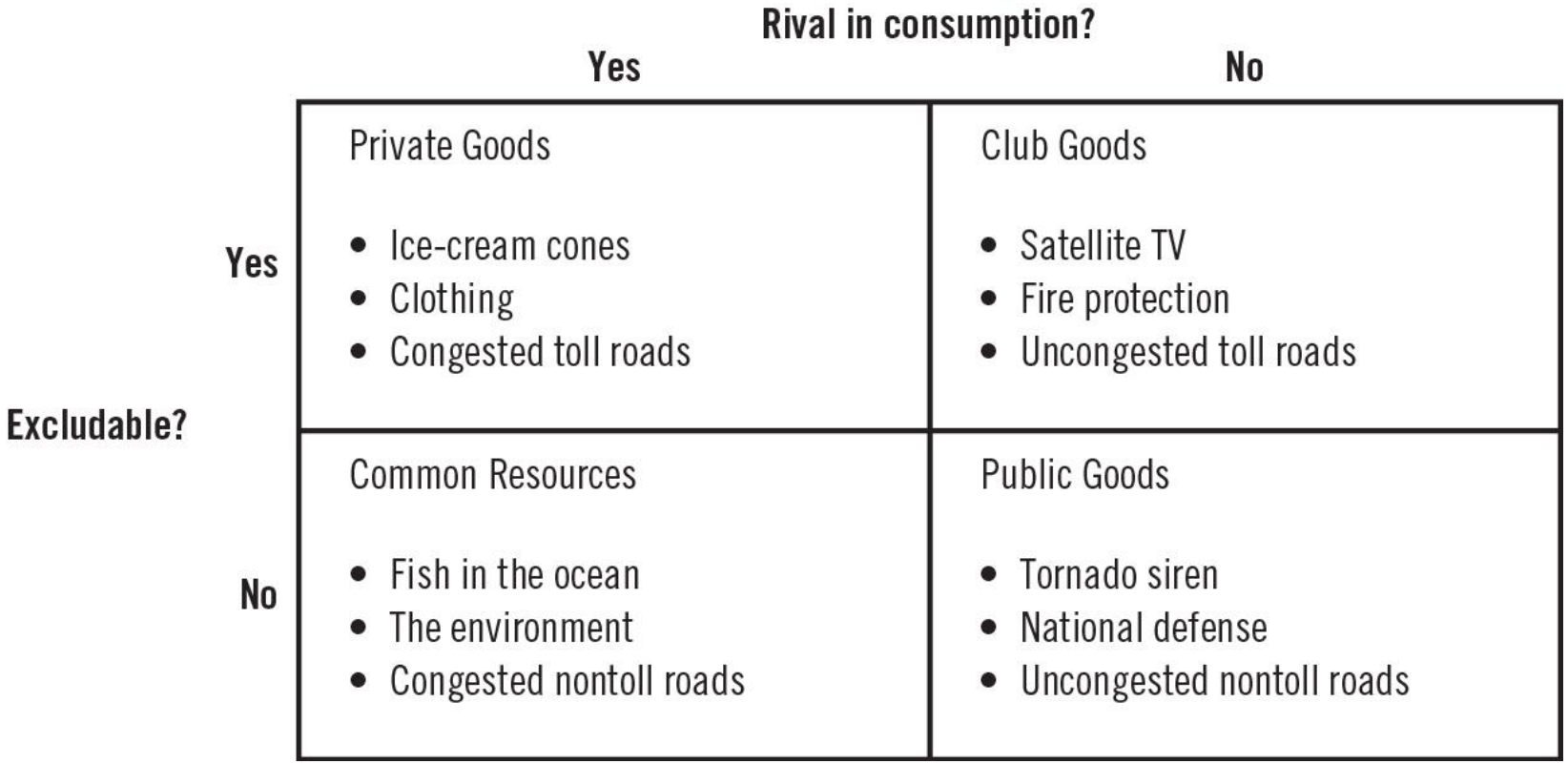
- Goods can be grouped into four categories accordingly:
- **Private goods***
  - Goods that are both excludable and rival in consumption
- **Public goods***
  - Goods that are not excludable nor rival in consumption

Types of Goods (2 of 2)

- **Common resources***
  - Goods that are rival in consumption but not excludable
- **Club goods***
  - Goods that are excludable but not rival in consumption

*Words accompanied by an asterisk are key terms from the chapter.

Figure 1 Four Types of Goods



Active Learning 1: Categorizing Roads

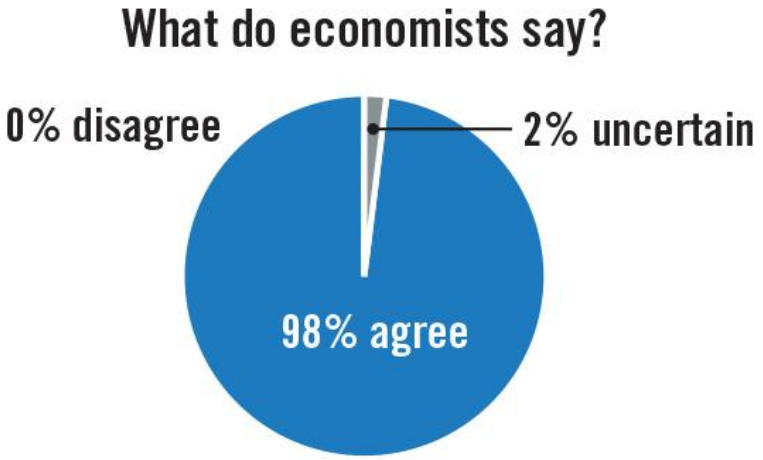
- A road is which of the four kinds of goods?
- Hint: The answer depends on whether the road is congested or not, and whether it's a toll road or not. Consider the different cases.

Active Learning 1: Answers

- Rival in consumption? Only if congested
- Excludable? Only if a toll road
- Four possibilities
  - Uncongested non-toll road: Public good
  - Uncongested toll road: Club good
  - Congested non-toll road: Common resource
  - Congested toll road: Private good

Ask the Experts: Congestion Pricing

"In general, using more congestion charges in crowded transportation networks—such as higher tolls during peak travel times in cities, and peak fees for airplane takeoff and landing slots—and using the proceeds to lower other taxes would make citizens on average better off."



Source: IGM Economic Experts Panel, January 11, 2012.

11-2

Public Goods

The Free-Rider Problem (1 of 2)

- **Free rider***
  - A person who receives the benefit of a good but avoids paying for it
- The free-rider problem
  - Public goods are not excludable
  - Prevents the private market from supplying the goods
  - Market failure
  - Positive externality

- *Words accompanied by an asterisk are key terms from the chapter.

The Free-Rider Problem (2 of 2)

- Government can remedy the free-rider problem if total benefits of a public good exceeds its costs
  - Provide the public good
  - Pay for it with tax revenue
  - Make everyone better off
- Problem: Measuring the benefit is usually difficult

Some Important Public Goods (1 of 2)

- National defense
  - Very expensive public good
  - Everybody agrees national defense is a public good the government should provide
- Basic research
  - Subsidized by government
  - The public sector fails to pay for the right amount and the right kinds
  - Difficulties: Hard to measure the benefits and decisions are made by politicians, not scientists

Some Important Public Goods (2 of 2)

- Fighting poverty
  - TANF (Temporary Assistance for Needy Families program)
    - Provides temporary income support for poor families with children
  - SNAP (Supplemental Nutrition Assistance Program)
    - Subsidizes the purchase of food for those with low incomes
  - EITC (Earned Income Tax Credit)
    - Provides tax rebates for those who work at low-wage jobs

The Difficult Job of Cost–Benefit Analysis

- The government
  - Provides public goods because the private market on its own will not produce an efficient quantity
  - Must determine what kinds of public goods to provide
  - Must determine what quantity of the public good to provide

Cost–Benefit Analysis

- **Cost–benefit analysis***
  - A study that compares the costs and benefits to society of providing a public good
- Estimate the total costs and benefits of the project to society as a whole
  - Are rough approximations at best
  - There are no price signals to observe

*Words accompanied by an asterisk are key terms from the chapter.

Active Learning 2: Let's Build a Fountain

- You and your neighbors (about 200 people) would love to have a water fountain in the neighborhood park. Each of you values having the fountain at $100. The neighborhood association finds a construction firm that will build the fountain for $7,000. A hat is passed around for the contributions, but once the money is counted, there are only $3,000 collected.

A. Should the fountain be built?

B. What happened? Will the fountain be built?

C. Can the government help build the fountain? How?

Active Learning 2: Answers

A. Should the fountain be built?
   - Yes, because the benefit (200 people × $100 = $20,000) exceeds the cost ($7,000)

B. What happened? Will the fountain be built?
   - The free-rider problem: some didn't contribute because they can still enjoy the fountain if built
   - Because only $3,000 were collected, the fountain cannot be built

C. Can the government help? How?
   - The government can tax every neighbor $35 and then use the money to build the fountain

How Much Is a Life Worth? (1 of 2)

- A town can spend $10,000 to install and operate a traffic light at an intersection that now has only a stop sign
- The benefit of the traffic light is increased safety
  - Based on data from similar intersections, it's been estimated that the light would reduce the risk of a fatal accident over the lifetime of the traffic light from 1.6 to 1.1 percent
- The benefit—the possibility of saving a person's life—is not directly monetary
- How to put a dollar value on a human life?

How Much Is a Life Worth? (2 of 2)

- One way to value human life is to look at the *risks that people are voluntarily willing to take* and *how much they must be paid* for taking them
- By comparing wages in risky and less risky occupations, economists can get some sense about what value people put on their own lives
  - Controlling for education, experience, and other determinants of wages
- Studies using this approach conclude that the value of a human life is about $10 million
- The expected benefit from installing the traffic light is $50,000> the cost of $10,000

11-3

Common Resources

The Tragedy of the Commons (1 of 3)

- **Tragedy of the commons***
  - A parable that illustrates why common resources are used more than is desirable from the standpoint of society as a whole
- Medieval town where sheep graze on common land
  - As the population grows, the number of sheep grows
  - The amount of land is fixed, the grass begins to disappear from overgrazing
  - With no grass left, raising sheep is impossible

*Words accompanied by an asterisk are key terms from the chapter.

The Tragedy of the Commons (2 of 3)

- Social and private incentives differ
  - The private incentives (using the land for free) outweigh the social incentives (using it carefully)
- The tragedy arises because of a *negative externality*
  - Allowing one's flock to graze on the common land reduces its quality for other families
  - People *neglect this external cost*, resulting in *overuse* of the land

The Tragedy of the Commons (3 of 3)

- Possible solutions:
  - Regulate the number of sheep per family
  - Internalized the externality by taxing sheep
  - Auction off a limited number of sheep-grazing permits
  - Make land private property: divide the land among town families

Some Important Common Resources (1 of 2)

- Clean air and water
  - Negative externality: pollution
  - Regulations or corrective taxes
- Congested roads
  - Negative externality: Congestion
  - Corrective tax: Charge drivers a tool
  - Tax on gasoline

Some Important Common Resources (2 of 2)

- Fish, whales, and other wildlife
  - Oceans: Least regulated common resource
  - Needs international cooperation
  - Difficult to enforce an agreement
- Fishing and hunting licenses
  - Limits on fishing and hunting seasons
  - Limits on size of fish
  - Limits on quantity of animals killed

Active Learning 3: Social Media

TikTok, Twitter, Instagram, and so on are examples of social media that most of us use

A. How is social media a common resource?

B. In your use of social media, have you had to deal with undesirable behavior of others? Is this an externality?

C. Do you think the providers of social media forums should regulate the behavior of users? If not, why not? If so, how?

11-4

Conclusion: Property Rights and Government Action

Conclusion

- Market fails to allocate resources efficiently
  - When something of value has no price attached to it
  - When property rights are not well established
- Government can potentially solve the problem
  - Help define property rights and unleash market forces
  - Regulate private behavior
  - Use tax revenue to supply a good that the market fails to supply

Think-Pair-Share Activity

While watching a nature documentary, you find that Kenya, Tanzania, and Uganda have made it illegal to kill elephants and sell their ivory. But countries like Botswana, Malawi, Namibia, and Zimbabwe allow people to kill elephants, but only those on their own property. Let's talk about elephants and chickens:

A. How is an elephant like a chicken? Different?

B. Which are going extinct: elephants or chickens?

C. How is it possible to turn an elephant into a chicken?

D. Where is the elephant population increasing?

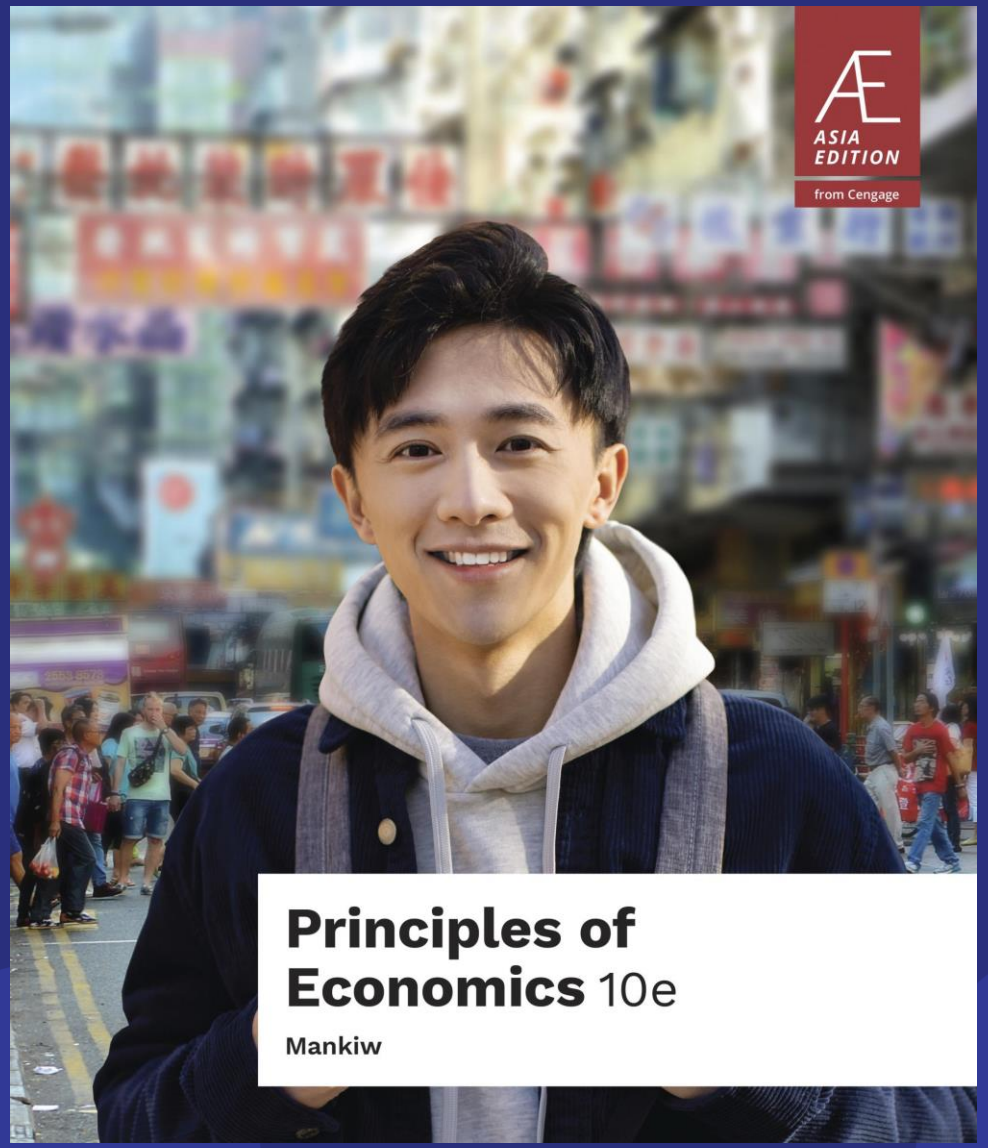
Self-Assessment

- What is a common resource that you make use of?
- Without government intervention, will you (among others) use this good too much or too little? Why?

Summary

Click the link to review the objectives for this presentation.

Link to Objectives



Principles of Economics, 10e

Chapter 13: The Design of the Tax System

Chapter Objectives

By the end of this chapter, you should be able to:

- Examine the design of the U.S. tax system.
- Determine the effects of a negative tax on an individual's tax liability.
- Classify a tax scheme as progressive, proportional, or regressive.

13-1

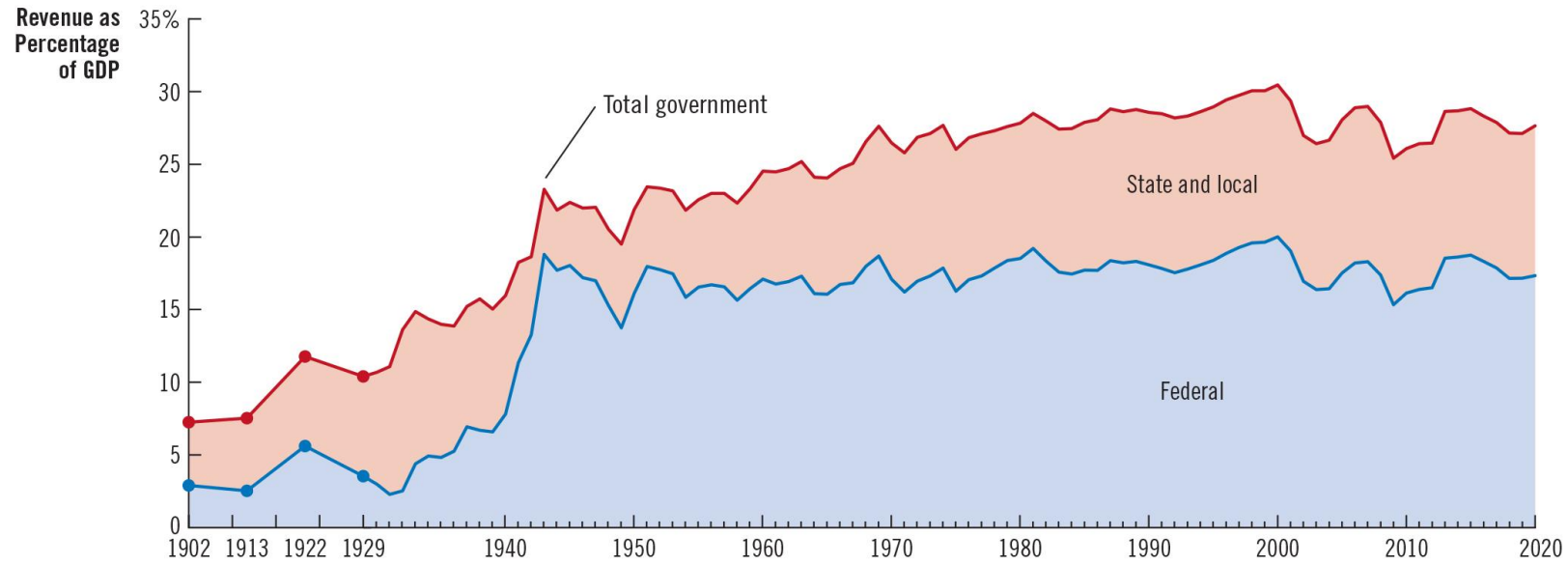
U.S. Taxation: The Big Picture

Government's Tax Revenue

- Role of government has grown substantially over past century
- As economy's income has grown, government's tax revenue has grown even more
  - 1902, government collected 7 percent of total income
  - Recent years, government has collected almost 30 percent

Figure 1 Government Revenue as a Percentage of GDP: Changes over Time

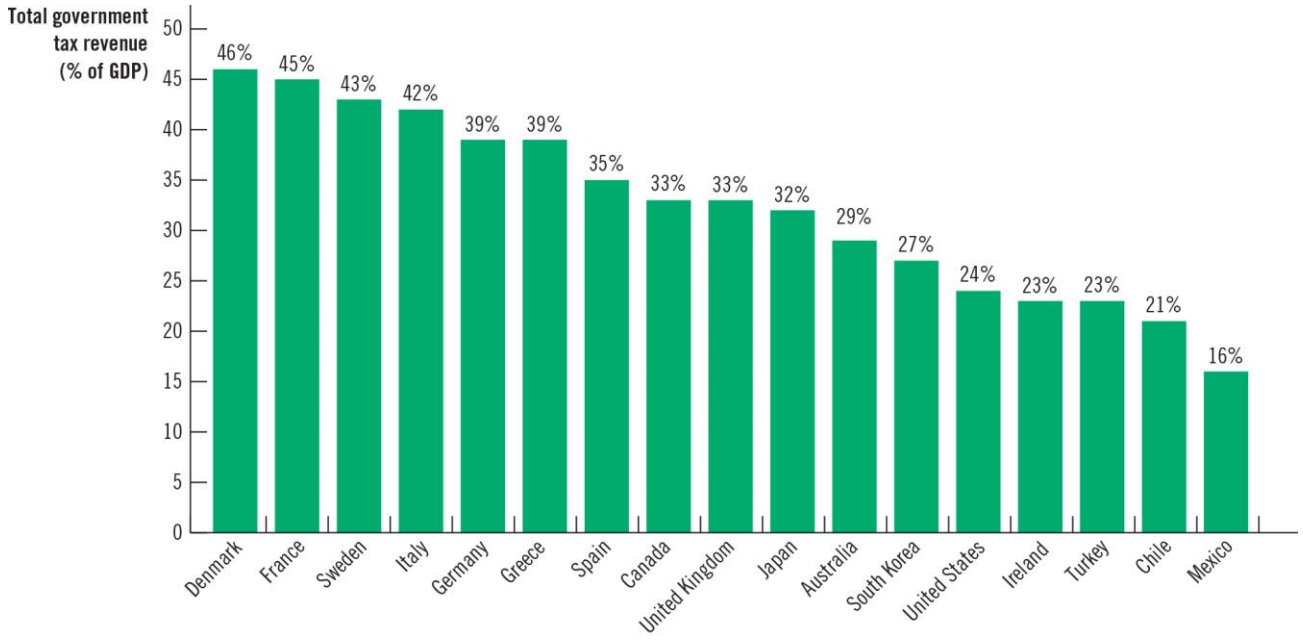
This figure shows the revenue of the federal government and of state and local governments as a percentage of gross domestic product (GDP), which measures total income in the economy. It shows that the government plays a large role in the U.S. economy and that its role has grown over time.



Source: Historical Statistics of the United States; Bureau of Economic Analysis; and author's calculations.

Figure 2 Government Revenue as a Percentage of GDP: International Comparisons

The percentage of income that governments take in taxes varies substantially from country to country.



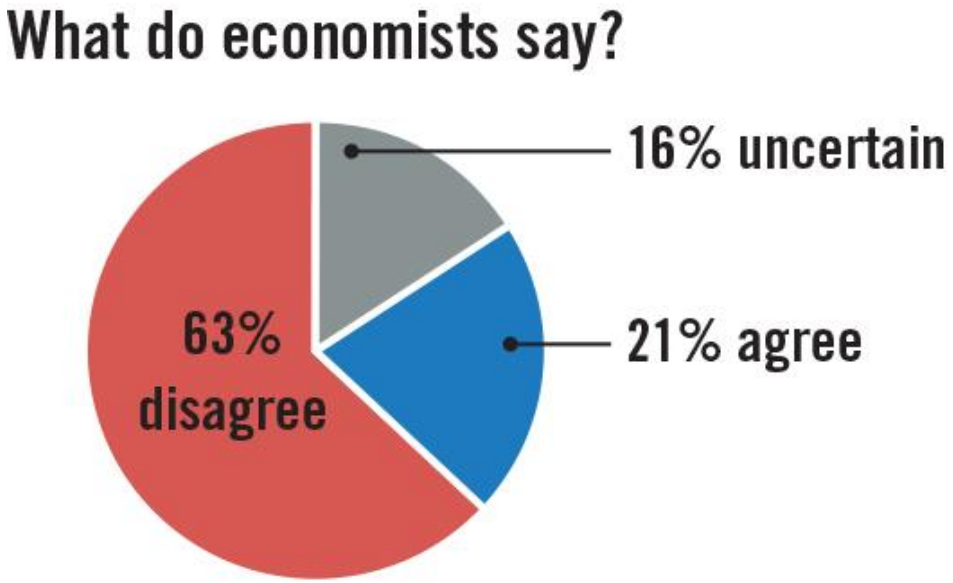
Source: OECD. Data are for 2019.

Taxes Collected by the Federal Government

- U.S. federal government collects two-thirds of taxes in the economy
- Personal income taxes
  - Largest source of revenue
  - Based on total income (wages, interest, dividends, profits)
- Marginal tax rate
  - Tax rate applied to each additional dollar of income
  - Rises as income rises, higher-income families pay a larger percentage of their income in taxes

Ask the Experts: Congestion Pricing

"Raising the top federal marginal tax on earned personal income to 70 percent (and holding the rest of the current tax code, including the top bracket definition, fixed) would raise substantially more revenue (federal and state, combined) without lowering economic activity."



Source: IGM Economic Experts Panel, January 16, 2019.

Table 1 Receipts of the Federal Government: 2020

Tax	Amount (billions)	Amount per Person	Percent of Receipts
Personal income taxes	$1,690	$5,106	46%
Social insurance taxes	1,421	4,293	39
Corporate income taxes	199	601	5
Other	354	1,069	10
Total	$3,664	$11,069	100%

Source: Bureau of Economic Analysis. Columns may not sum to total due to rounding.

Payroll Taxes

- Payroll taxes
  - Levied on the wages that a firm pays its workers
- Social insurance taxes
  - Pays for Social Security and Medicare
- Social Security
  - Income-support program for the elderly
- Medicare
  - Government health program for the elderly

Table 2 The Federal Income Tax Rates: 2020

- This table shows the marginal tax rates for single taxpayers.
- The taxes owed depend on all the marginal tax rates up to the taxpayer's income level.
- For example, a taxpayer with an income of $40,000 pays 10 percent of the first $9,875 of income and then 15 percent of the rest.

On Taxable Income . . .	The Tax Rate Is . . .
From $0 to $9,875	10%
From $9,876 to $40,125	15%
From $40,126 to $85,525	22%
From $85,526 to $163,300	24%
From $163,301 to $207,350	32%
From $207,351 to $518,400	35%
From $518,401 and above	37%

Corporate Income Taxes

- Corporation
  - Business set up to have its own legal existence
- Corporate profits are taxed twice
  - Corporate income tax when corporation earns the profits
  - Individual income tax when corporation uses its profits to pay dividends to shareholders

Other Taxes

- Excise taxes
  - Taxes on specific goods like gasoline, cigarettes, and alcoholic beverages
- Estate taxes
- Customs duties

Taxes Collected by State and Local Governments (1 of 2)

- State and local governments collect about a third of all taxes paid
- Property taxes
  - Percentage of estimated value of land and structures
  - Paid by property owners
- Individual and corporate income taxes

Taxes Collected by State and Local Governments (2 of 2)

- State and local governments also receive substantial funds from the federal government
- Redistribute funds from high-income states (which pay more taxes) to low-income states (which receive more benefits)
- Other receipts
  - Fees for fishing and hunting licenses
  - Tolls from roads and bridges
  - Fares for public buses and subways

Table 3 Receipts of State and Local Governments: 2020

Tax	Amount (billions)	Amount per Person	Percent of Receipts
Property taxes	$586	$1,770	19%
Personal income taxes	466	1,408	15
Sales taxes	426	1,287	14
Excise taxes	209	631	7
Corporate income taxes	76	230	3
Federal government	873	2,637	29
Other	395	1,193	13
Total	$3,031	$9,157	100%

Source: Bureau of Economic Analysis. Columns may not sum to total due to rounding

13-2

Taxes and Efficiency

Deadweight Losses (1 of 2)

- Well-designed tax policy avoids (minimizes)
  - Deadweight losses that result when taxes distort the decisions people make
  - Administrative burdens imposed on taxpayers as they comply with the tax laws

Deadweight Losses (2 of 2)

- Taxes distort incentives and entail deadweight losses
- Deadweight loss of a tax
  - Reduction in market participants' well-being in excess of the revenue raised for the government
  - Inefficiency as people allocate resources according to tax incentives rather than the costs and benefits of the goods and services
- Externalities
  - A market on its own can lead to inefficient outcome and the right tax can correct the problem

Administrative Burden

- Tax system's administrative burden is a cause of inefficiency
- Resources devoted to complying with tax laws are a type of deadweight loss
  - Can be reduced by simplifying tax laws
- Complexity of tax law results from political process as taxpayers with their own special interests lobby for their causes

Marginal Tax Rates versus Average Tax Rates

- **Average tax rate***
  - Total taxes paid divided by total income
- **Marginal tax rate***
  - The increase in taxes from an additional dollar of income

*Words accompanied by an asterisk are key terms from the chapter.

Lump-Sum Taxes

- **Lump-sum tax***
  - A tax that is the same amount for every person
- Most efficient tax possible
  - Does not distort incentives
  - Does not cause deadweight losses
  - Imposes a minimal administrative burden
- Most people would consider lump-sum tax unfair

*Words accompanied by an asterisk are key terms from the chapter.

13-3

Taxes and Equity

The Benefits Principle

- **Benefits principle***
  - The idea that people should pay taxes based on the benefits they receive from government services
- Tries to make public goods like private goods
- A person who gets great benefit from a public good should pay more for it than a person who gets little benefit

*Words accompanied by an asterisk are key terms from the chapter.

The Ability-to-Pay Principle

- **Ability-to-pay principle***
  - The idea that taxes should be levied on a person according to how well that person can shoulder the burden
- **Vertical equity***
  - The idea that taxpayers with a greater ability to pay taxes should pay larger amounts
- **Horizontal equity***
  - The idea that taxpayers with similar abilities to pay taxes should pay the same amount

*Words accompanied by an asterisk are key terms from the chapter.

Three Tax Systems

- **Proportional tax***
  - A tax for which taxpayers at all income levels pay the same fraction of income
- **Regressive tax***
  - A tax for which taxpayers with high incomes pay a smaller fraction of their income than do taxpayers with low incomes
- **Progressive tax***
  - A tax for which taxpayers with high incomes pay a larger fraction of their income than do taxpayers with low incomes

*Words accompanied by an asterisk are key terms from the chapter.

Table 4 Three Tax Systems

	Proportional Tax	Proportional Tax	Regressive Tax	Regressive Tax	Progressive Tax	Progressive Tax
Income	Amount of Tax	Percent of Income	Amount of Tax	Percent of Income	Amount of Tax	Percent of Income
$50,000	$12,500	25%	$15,000	30%	$10,000	20%
100,000	25,000	25	25,000	25	25,000	25
200,000	50,000	25	40,000	20	60,000	30

Table 5 The Burden of Federal Taxes

Quintile	Average Market Income	Taxes as a Percentage of Market Income	Taxes Less Transfers as a Percentage of Market Income
Lowest	$16,600	0.0%	−127.1%
Second	35,900	11.1	−44.0
Middle	63,900	15.5	−11.1
Fourth	104,000	18.8	4.6
Highest	310,000	25.4	21.3
Top	1,987,500	30.3	29.7

Horizontal Equity

- Taxpayers with similar abilities to pay taxes should pay the same amount
  - Determine which differences are relevant for a family's ability to pay and which differences are not
- U.S. tax code has special provisions that alter a family's tax based on its specific circumstances

Tax Incidence and Tax Equity

- Tax incidence—study of who bears the burden of taxes
  - Central to evaluating tax equity
- Taxes have indirect effects
  - Affect people beyond those who pay the tax
  - Alter supply and demand
  - Alter equilibrium prices

Active Learning 1: Taxes and Marriage

- The income tax rate is 25%. The first $20,000 of income is excluded from taxation. Tax law treats a married couple as a single taxpayer. Makena and David each earn $50,000.

A. If Makena and David are unmarried and living together, what is their combined tax bill?

B. If Makena and David are married, what is their tax bill?

Active Learning 1: Answers

A. If unmarried, Makena and David each pay

   0.25 × ($50,000 – 20,000) = $7,500

   Total taxes = $15,000 = 15% of their joint income

B. If married, they pay

   0.25 × ($100,000 – 20,000) = $20,000 or 20% of their joint income

- The $5,000 increase in the tax bill is called the “marriage tax” or “marriage penalty”

Active Learning 2: Taxes and Marriage, Again

- The income tax rate is 25%. For singles, the first $20,000 of income is excluded from taxation. For married couples, the exclusion is $40,000. Daniel earns $0. Ciara earns $100,000.

A. If Daniel and Ciara are living together unmarried, what is their combined tax bill?

B. If Daniel and Ciara are married, what is their tax bill?

Active Learning 2: Answers

A. If unmarried, Daniel pays $0 in taxes

   Ciara pays: 0.25 × ($100,000 – 20,000) = $20,000

   Total taxes = $20,000 = 20% of their joint income

B. If married, they pay 0.25 × ($100,000 – 40,000) = $15,000 or 15% of their joint income

- The $5000 decrease in the tax bill is called the “marriage subsidy”

13-4

Conclusion: The Trade-Off between Equity and Efficiency

Conclusion

- Equity and efficiency
  - The two most important goals of a tax system
  - Can conflict, especially when equity is judged by progressivity
- Policymakers often face a trade-off between efficiency and equity
- Much of the debate over tax policy arises because people give different weights to these two goals

Think-Pair-Share Activity

You are having a political debate with a friend. The discussion centers on taxation. You show your friend some data from your economics textbook that suggests that the average American paid about $11,000 in federal income tax in 2020. Your friend says, “If $11,000 per person is what it takes to run this country, then I think that it would be much simpler if we just billed each American $11,000 and eliminated the complex tax code.”

A. What type of tax is your friend suggesting? What is its appeal?

B. Is this type of tax supported by the “benefits principle” of tax equity? Explain

C. Is this type of tax supported by the “ability-to-pay” principle of tax equity? Is it vertically equitable? Is it horizontally equitable?

D. Your friend agrees that the tax is not equitable, so she now suggests that we simply tax rich corporations since they can clearly afford it and then people wouldn’t have to pay any taxes. Is she correct? Who would actually pay the taxes? Explain.

Self-Assessment

- Should people with high incomes pay more taxes than people with low incomes? Why?

Summary

Click the link to review the objectives for this presentation.

Link to Objectives