Chapter 17

Public Goods and Common Resources
A way to classify goods that predicts whether a good is a private good—a good that can be efficiently provided by free markets
- What public goods are, and why markets fail to supply them
- What common resources are, and why they are overused
- What artificially scarce goods are, and why they are underconsumed
- How government intervention in the production and consumption of these types of goods can make society better off
- Why finding the right level of government intervention is difficult
• What’s the difference between installing a new bathroom in a house and building a municipal sewage system?

• What’s the difference between growing wheat and fishing in the open ocean?

• In each case there is a basic difference in the characteristics of the goods involved.
  ▪ Bathroom appliances and wheat have the characteristics needed to allow markets to work efficiently; sewage systems and fish in the sea do not.

• Let’s look at these crucial characteristics and why they matter.
Characteristics of Goods

• Goods can be classified according to two attributes:
  ▪ whether they are *excludable*
  ▪ whether they are *rival in consumption*

• A good is **excludable** if the supplier of that good can prevent people who do not pay from consuming it.

• A good is **rival in consumption** if the same unit of the good cannot be consumed by more than one person at the same time.
Characteristics of Goods

- A good that is both excludable and rival in consumption is a **private good**.

- When a good is **nonexcludable**, the supplier cannot prevent consumption by people who do not pay for it.

- A good is **nonrival in consumption** if more than one person can consume the same unit of the good at the same time.
There are four types of goods:

1) **Private goods**, which are excludable and rival in consumption, like wheat

2) **Public goods**, which are nonexcludable and nonrival in consumption, like a public sewer system

3) **Common resources**, which are nonexcludable but rival in consumption, like clean water in a river

4) **Artificially scarce goods**, which are excludable but nonrival in consumption, like pay-per-view movies on cable TV
### Characteristics of Goods

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*Artificially scarce goods*
• Goods that are both excludable and rival in consumption are private goods.

• Private goods can be efficiently produced and consumed in a competitive market.
Why Markets Can Supply Only Private Goods Efficiently

- Goods that are **nonexcludable** suffer from the **free-rider problem**: individuals have no incentive to pay for their own consumption and instead will take a “free ride” on anyone who does pay.

- When goods are **nonrival in consumption**, the efficient price for consumption is zero.

- If a positive price is charged to compensate producers for the cost of production, the result is inefficiently low consumption.
 According to researchers, murder rates in Europe in 1200 were 30 to 40 per 100,000 people.
  - But by 1500 the rate had been halved to around 20 per 100,000; today, it is less than 1 per 100,000.

 What accounts for the sharp decrease in mayhem over the last 900 years?
  - Western Europe was able to move from mayhem to Renaissance through the creation of public goods like good governance and defense—goods that benefited everyone and could not be diminished by any one person’s use.
ECONOMICS IN ACTION

FROM MAYHEM TO RENAISSANCE

• Citizens began to organize and create institutions for protection.
  - In Venice, citizens built a defensive fleet to battle the pirates and other marauders who regularly attacked them.
  - Other city-states built strong defensive walls to encircle their cities and also paid defensive militias.

• Institutions were created to maintain law and order: cadres of guards, watchmen, and magistrates were hired; courthouses and jails were built.
As a result, trade, commerce, and banking were able to flourish, as well as literacy, numeracy, and the arts.

- By 1300, the leading cities of Venice, Milan, and Florence had each grown to more than 100,000 people.
- As resources and the standard of living increased, the rate of violent deaths diminished.
Most people believe crime prevention is a responsibility of government. However, individuals also take their own measures to prevent theft.

- Example: Putting locks on doors or hiring private security guards
A Policemen’s Lot: Public or Private Good?

• Then, why do we have police departments?

• Law enforcement, as opposed to self-protection, is a **public good**.

• The benefits of hiring security guards is **rival** and **excludable**. But the benefits of tracking criminals and policing public areas accrue to all law-abiding citizens.
The beginning of police departments can be traced to two eighteenth-century institutions that focused on public-good aspects of crime prevention:

- the Bow Street Runners
- the Thames River Police

In 1829, Sir Robert Peel, building on the lessons learned from these institutions, oversaw the creation of a unified London police force.
Public Goods

- A **public good** is the exact opposite of a private good: it is a good that is both nonexcludable and nonrival in consumption.

- Here are some other examples of public goods:
  - *Disease prevention*: When doctors act to stamp out the beginnings of an epidemic before it can spread, they protect people around the world.
  - *National defense*: A strong military protects all citizens.
  - *Scientific research*: More knowledge benefits everyone.
Providing Public Goods

• Because most forms of public good provision by the private sector have serious defects, they must be provided by the government and paid for with taxes.

• The marginal social benefit of an additional unit of a public good is equal to the sum of each consumer’s individual marginal benefit from that unit.

• At the efficient quantity, the marginal social benefit equals the marginal cost.

• The following graph illustrates the efficient provision of a public good.
A Public Good

(a) Ted’s Individual Marginal Benefit Curve

(b) Alice’s Individual Marginal Benefit Curve

Marginal benefit

Quantity of street cleanings (per month)

Marginal benefit

Quantity of street cleanings (per month)
The marginal social benefit curve of a public good equals the vertical sum of individual marginal benefit curves.
Providing Public Goods

• No individual has an incentive to pay for providing the efficient quantity of a public good because each individual’s marginal benefit is less than the marginal social benefit.

• This is a primary justification for the existence of government.
VOTING AS A PUBLIC GOOD

- As the economist Mancur Olson pointed out in a famous book titled *The Logic of Collective Action*, voting is a public good, one that suffers from severe free-rider problems.

- Imagine that you are one of a million people who would stand to gain the equivalent of $100 each if some plan is passed in a statewide referendum—say, a plan to improve public schools.
VOTING AS A PUBLIC GOOD

• And suppose that the opportunity cost of the time it would take you to vote is $10. Will you be sure to go to the polls and vote for the referendum?

• If you are rational, the answer is no!

• The reason is that it is very unlikely that your vote will decide the issue, either way. If the measure passes, you benefit, even if you didn’t bother to vote—the benefits are nonexcludable.
VOTING AS A PUBLIC GOOD

• If the measure doesn’t pass, your vote would not have changed the outcome. Either way, by not voting—by free-riding on those who do vote—you save $10.

• The result is that when a large group of people share a common political interest, they are likely to exert too little effort promoting their cause and so will be ignored.
  - Conversely, small, well-organized interest groups that act on issues narrowly targeted in their favor tend to have disproportionate power.
GLOBAL COMPARISON

Voter turnout rate (percent)

Singapore: 93.2%
Australia: 93.2%
Belgium: 89.2%
South Africa: 77.3%
United Kingdom: 66.0%
Canada: 61.4%
India: 58.2%
Pakistan: 44.6%
United States: 41.6%

Source: International Institute for Democracy and Electoral Assistance.
Cost-Benefit Analysis

• Governments engage in **cost-benefit analysis** when they estimate the social costs and social benefits of providing a public good.

• Although governments should rely on **cost-benefit analysis** to determine how much of a public good to supply, doing so is problematic because individuals tend to overstate the good’s value to them.
Old Man River

• The Mississippi River changes its course every few hundred years.

• By 1950, it was apparent that the river was about to shift course, taking a new route to the sea.
  ▪ If the Army Corps of Engineers (USACE) hadn’t gotten involved, the shift would probably have happened by 1970.
Old Man River

• A shift in the Mississippi would have severely damaged the Louisiana economy.
  ▪ So the USACE has kept the Mississippi in its place with a huge complex of dams, walls, and gates known as the *Old River Control Structure*.

• The Old River Control Structure is a dramatic example of a public good. No individual would have had an incentive to build it, yet it protects many billions of dollars’ worth of private property.
Common Resources

• A **common resource** is nonexcludable and rival in consumption: you can’t stop me from consuming the good, and more consumption by me means less of the good available for you.

• Some examples of common resources are clean air and water as well as the diversity of animal and plant species on the planet (biodiversity).

• In each of these cases, the fact that the good, though rival in consumption, is nonexcludable poses a serious problem.
The Problem of Overuse

- Common resources left to the free market suffer from *overuse*.

- **Overuse** occurs when a user depletes the amount of the common resource available to others but does not take this cost into account when deciding how much to use the common resource.

- In the case of a common resource, the *marginal social cost* of my use of that resource is higher than my individual *marginal cost* or the cost to me of using an additional unit of the good.

- The following figure illustrates this point.
A Common Resource

Price of fish

Quantity of fish

$P_{OPT}$

$P_{MKT}$

$Q_{OPT}$

$Q_{MKT}$

$O$

$E$

$MKT$

$D$

$MSC$
To ensure efficient use of a common resource, society must find a way of getting individual users of the resource to take into account the costs they impose on other users.

Like negative externalities, a common resource can be efficiently managed by:

- a tax or a regulation imposed on the use of the common resource.
- making it excludable and assigning property rights to it.
- creating a system of tradable licenses for the right to use the common resource.
A WATER FIGHT IN MAINE

• Since 2004, Mainers have been engaged in a fierce battle over one of their natural resources: groundwater.

• Maine’s groundwater, or natural water, is a valuable commodity as drinking water, long prized for its purity and taste.
  - In Maine, the principle of “capture” defines the ownership of water: a property owner can pump any amount of groundwater without regard to the effect on the underground aquifer, the naturally occurring underground reservoir of an area’s water.
A WATER FIGHT IN MAINE

• But with big companies like Poland Spring extracting groundwater to satisfy the demands of millions of customers across the country, some Mainers fear that they can no longer afford this policy.
A WATER FIGHT IN MAINE

• The concerns expressed over commercial water extraction are two fold.
  ▪ One is the problem of managing a common resource. Without oversight, what prevents water bottlers from overdrawing Maine’s aquifer, leaving too little water for its residents?
  ▪ Second, by law the underground aquifer belongs to the people of Maine.
A WATER FIGHT IN MAINE

• Why shouldn’t they revoke the principle of capture and receive some compensation from bottlers for the sale of their water?
FOR INQUIRING MINDS

A WATER FIGHT IN MAINE

• They point to the example of Alaska, with its huge oil reserves, where the state government imposes a 22.5% tax on oil company profits.

• Tax revenues are distributed to Alaska residents in the form of greater services and lower taxes (and even subsidies).

• The water bottlers counter that the property taxes and wages that they already pay bring millions of dollars into the Maine economy.
ECONOMICS IN ACTION

SAVING THE OCEANS WITH ITQS

• According to a 2011 study by the International Program on the State of the Oceans, there is an imminent risk of widespread extinctions of multiple species of fish.
  ▪ In Europe, 30% of the fish stocks are in danger of collapse.
  ▪ In the North Sea, 93% of cod are fished before they can breed.
  ▪ And bluefin tuna, a favorite in Japanese sushi, are in danger of imminent extinction.
SAVING THE OCEANS WITH ITQS

• Not surprisingly, the principal culprit is overfishing.
  - The decline of fishing stocks has worsened as fishermen trawl in deeper waters with their very large nets to catch the remaining fish, unintentionally killing many other marine animals in the process.

• The fishing industry is in crisis, too, as fishermen’s incomes decline and they are compelled to fish for longer periods and in more dangerous waters to make a living.
SAVING THE OCEANS WITH ITQS

- But, individual transferable quotas, or ITQs, may provide a solution to both crises.

- Under an ITQ scheme, a fisherman receives a license entitling him to catch an annual quota within a given fishing ground.

- The ITQ is given for a long period, sometimes indefinitely. Because it is transferable, the owner can sell or lease it.
• An **artificially scarce good** is excludable but nonrival in consumption.

• Because the good is nonrival in consumption, the efficient price to consumers is zero.

• However, because it is excludable, sellers charge a positive price, which leads to inefficiently low consumption.
Artificially Scarce Goods

• A good is made artificially scarce because producers charge a positive price.

• The marginal cost of allowing one more person to consume the good is zero.

• The problems of artificially scarce goods are similar to those posed by a natural monopoly.
An Artificially Scarce Good

The efficient quantity, $Q_{OPT}$, exceeds the quantity demanded in an unregulated market, $Q_{MKT}$. The shaded area represents the loss in total surplus from charging a price of $4.$

Deadweight loss

Price of pay-per-view movie

Quantity of pay-per-view movies watched

$4$

$0$

$Q_{OPT}$

$Q_{MKT}$
BLACKED-OUT GAMES

• You flip to the local channel that is an affiliate of the network that has a nationally televised game—but the game isn’t on.

• This blackout is at the insistence of the team’s owners, who don’t want people who might have paid for tickets staying home and watching the game on TV instead.
  - Often games that fail to sell out their stadium tickets are blacked out in local broadcast markets.
So the good in question—watching the game on TV—has been made artificially scarce.

- Because the game is being broadcast anyway, no scarce resources would be used to make it available in its immediate locality as well.

But it isn’t available—which means a loss in welfare to those who would have watched the game on TV but are not willing to pay the price, in time and money, to go to the stadium.
TED TALKS: James H. Kunstler dissects suburbia

1. Goods may be classified according to whether they are **excludable** and whether they are **rival in consumption**.

2. Free markets can deliver efficient levels of production and consumption for **private goods**, which are both excludable and rival in consumption.

3. When goods are **nonexcludable**, there is a **free-rider problem**: consumers will not pay for the good, leading to inefficiently low production.

When goods are **nonrival in consumption**, they should be free, and any positive price leads to inefficiently low consumption.
4. A **public good** is nonexcludable and nonrival in consumption. In most cases a public good must be supplied by the government.

The **marginal social benefit** of a public good is equal to the sum of the individual marginal benefits to each consumer.

The **efficient quantity** of a public good is the quantity at which marginal social benefit equals the marginal cost of providing the good.

Like a positive externality, marginal social benefit is greater than any one individual’s marginal benefit, so no individual is willing to provide the efficient quantity.
5. One rationale for the presence of government is that it allows citizens to tax themselves to provide public goods. Governments use cost-benefit analysis to determine the efficient provision of a public good.
6. A **common resource** is rival in consumption but nonexcludable.

It is subject to **overuse**, because an individual does not take into account the fact that his or her use depletes the amount available for others.

This is similar to the problem of a negative externality: the marginal social cost of an individual’s use of a common resource is always higher than his or her individual marginal cost.

Pigouvian taxes, the creation of a system of tradable licenses, or the assignment of property rights are possible solutions.
7. **Artificially scarce goods** are excludable but nonrival in consumption. Because no marginal cost arises from allowing another individual to consume the good, the efficient price is zero.

A positive price compensates the producer for the cost of production but leads to inefficiently low consumption.

The problem of an artificially scarce good is similar to that of a natural monopoly.
Key Terms

- Excludable
- Rival in consumption
- Private good
- Nonexcludable
- Nonrival in consumption
- Free-rider problem
- Public good
- Cost-benefit analysis
- Common resource
- Overuse
- Artificially scarce good