

Public Goods and Common Resources

In the market quantities are allocated by prices.

Goods without prices provide a special challenge for economic analysis. Most goods in our economy are allocated in market, in which buyers pay for what they receive and sellers are paid for what they provide. For these goods prices are the signals that guide the decisions of buyers and sellers, and these decisions lead to an efficient allocation of resources. When goods are available free of charge, however, the market forces that normally allocate resources in our economy are absent.

⇒ The different kinds of Goods

Jim thinking about the various goods in the economy, it is useful to group them according to two characteristics.

B Is the good Excludable?

The property of a good whereby a person can be prevented from using it.

e.g. You can prevent anyone eating ice cream that you eat.

i) Is the Good Rival in Consumption?

The property of a good whereby one person's use diminishes other persons' use.

e.g. You fishing in an ocean reduces the chances of catching fish for other people in the same ocean.

⇒ Using these two characteristics, Jim divides goods into four categories.

Rival in Consumption

	Yes	No
Yes	Private goods <ul style="list-style-type: none">Ice cream conesClothing	Club goods <ul style="list-style-type: none">Fire protectionCable TV
No	Common resources <ul style="list-style-type: none">Fish in OceanThe environment	Public goods <ul style="list-style-type: none">Tornado SirenNational defences

Excludable:

1) Private goods

Private goods are both excludable and rival in consumption.

For example,

An ice cream cone is excludable because it is possible to prevent someone from eating one - you just don't give it to her. An ice cream cone is rival in consumption because if one person eats an ice cream cone, another person cannot eat the same cone.

Most goods in the economy are private goods like ice cream cones: You don't get one unless you pay for it, and once you have it, you are the only person who benefits.

2) Public Goods

Public goods are neither excludable nor rival in consumption. That is, people can't be prevented from using

a public good, and one person's use of a public good does not reduce another person's ability to use it.

For example

Tornado Siren.

3) Common Resources, 8

Common Resources are Rival in Consumption but not excludable. For example.

Fish in the Ocean are rival in Consumption: When one person catches fish, there are fewer fish for the next person to catch. Yet these fish are not an excludable good because, given the vast size of an Ocean, it is difficult to stop fishermen from taking fish out of it.

4) Club Goods, 8

Club goods are excludable

but not rivals in consumption. For instance, consider the fire protection in a small town. It is easy to exclude someone from using this good: The firm department can just let her house burn down. Yet fire protection is not rival in consumption: Once a town has paid for the firm department, the additional cost of protecting one more house is small.

In this chapter, we examine goods which are not excludable: Public Goods and Common resources. Because people cannot be prevented from using these goods, they are available for everyone free of charge.

⇒ There is a relationship between public Goods and Common resources with externalities.

These kinds of goods are free of charge, and there is something that has value and don't pay for it.

- Tornado Siren \Rightarrow Positive externality because everyone benefits.
- Fishing \Rightarrow Negative externality because fishing is Rival in consumption which reduces the changes for other types of Fishing.

1) \Rightarrow Public Good &

To understand how Public Goods differ from other goods and why they present problems for society, let's consider an example of fireworks display. This good is not excludable because you can't prevent someone from seeing fireworks, and it is not rival in consumption because one person's enjoyment of fireworks does not reduce anyone else's enjoyment of them.

- The Free-Rider Problem & A person who receives

the benefit of good but avoids paying for it, it is called free Rider.

- On the 4th of July each other of the town's 500 residents places a \$10 value on the experience for the total benefit of \$5000. The cost putting on a firework display is \$1000 cost, it is efficient for small town to have a firework display on the 4th of July.
- Would the private market produce the efficient outcome? probably not, because of free riders.
- Although the private market fails to supply the fireworks display demanded by smalltown & residents, the solution to smalltown's problem is Obvious: The local government can sponsor a 4th of July Celebration. A town Council can raise everyone's taxes by \$2

tax bill and use the revenue to hire Ellen to produce the fireworks. Everyone in Smalltown is better off by \$8 - The \$10 at which the residents value the fireworks minus the \$2 tax bill. Ellen can help Smalltown reach the efficient outcome as a public employee even though she could not do as a private entrepreneur.

⇒ Some Important Public Goods

There are many examples of public goods. Here are three of the most important.

B) National defense

The defense of a country from foreign aggressors is a classic example of a public good. Once the country is defended, it is impossible to prevent any single person from

enjoying the benefit of this defense. Moreover, when one person enjoys the benefit of national defense, she does not reduce the benefit to anyone else. Thus, national defense is neither excludable nor rival in consumption.

i) Basic Research,

Knowledge is created through research. It is important to distinguish general knowledge from specific technological knowledge, such as the invention of a longer-lasting battery, a smaller microchip, or a better digital music player. Can be patented. The patent gives the inventor the basic right to the knowledge she has created for a period of time. Anyone else who wants to use the patented information must pay the inventor for the right to do so. In other words the patent makes the knowledge

created by the inventor
excludable.

By contrast, general knowledge
is a public good. For
example the mathematician
cannot patent a theorem. Once
a theorem is proven, the
knowledge is not excludable.
The theorem enters society's
general pool of knowledge
that anyone can use
without charge. The theorem
is also not rival in
consumption: One person's use
of the theorem does not
prevent any other person
from using the theorem.

iii) Fighting Poverty &

Because of the free-rider
problem, eliminating poverty
through private charity
will probably not work.
Yet government action can
solve this problem. Taxing
the wealthy to raise
the living standards of
the poor can potentially

make everyone better off. The poor are better off because they now enjoy a higher standard of living and those paying the taxes are better off because they enjoy living in a society with less poverty.

⇒ Cost-Benefit analysis &

A study that compares the costs and benefits to society of providing a public good.

Cost-benefits theorem &

Sum of all the total costs and compare with future incomes.
Difficult to measure.

2) ⇒ Common Resources &

Common resources like public goods, are not excludable; they are available free of charge to anyone who wants to use them. Common resources are, however, rivals

in Consumption : One person's use of the common resources reduces others people's ability to use it.

→ The tragedy of the Commons

A Parable (a short story) that illustrates why common resources are used more than is desirable from the standpoint of society as a whole.

Page 11.3a briefly explained with example.

↳ The tragedy of the commons is a story with a general lesson: When one person uses a common resources, she diminishes other people's enjoyment of it. Because of this negative externality, common resources tend to be used excessively. The government can solve the problem by using regulation or taxes to reduce consumption of the common

resources. Alternatively the government can sometimes turn the common resources into a private good.

⇒ Some important common resources. There are many examples of common resources. In almost all cases, the same problem arises as in the tragedy of the Commons: Private decision makers use the common resources too much. Government often regulate behavior or impose fees to mitigate the problem of overuse.

• Clean air and water
As discussed in previous chapter markets do not adequately protect the environment. Pollution is a negative externality that can be corrected with regulations or with corrective taxes on polluting activities. One can view this market failure as an example of market - resource problem. Clean air and clean water are

common resources like open grazing land, or excessive pollution is like excessive grazing. Environmental degradation is a modern Tragedy of Commons.

ii) Congested Roads (overflowing with blood) [~~roads~~ ~~over~~ ~~up~~ ~~to~~ ~~sp~~]

Roads can be either public goods or common resources. If a road is not congested, then one person's use does not affect anyone else's use. In this case, use is not rival in consumption, and the road is ~~not~~ a public good. Yet if the road is congested, then use of that road yields a negative externality. When one person drives on the road, it becomes more crowded, and other people must drive more slowly. In this case road is a common resource.

B) One way for the

government to address the problem of road congestion is to charge drivers a toll. A toll is, in essence, a corrective tax on the externality of congestion.

- ii) Another policy that responds to the problem of road congestion is the tax on gasoline.
- iii) Fish, Whales, and other Wildlife & Many species of animals are common resources. Fish and whales, for instance, have commercial value, and anyone can go to the ocean and catch whatever is available. Each person has little incentive to maintain the species for the next year. Just as excessive grazing can destroy the Town Common, excessive fishing and whaling can destroy commercially valuable marine population.

Within the United States,

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various laws aim to manage the use of fish and other wildlife. For example, the government charges for fishing and hunting licences, and it restricts the lengths of the fishing and hunting seasons. Fishermen are often required to throw back small fish, and hunters can kill only a limited number of animals. All these laws reduce the use of common resources and helps to maintain animal population.

⇒ Conclusion 8

All these kinds of problems are generated in the absence of the property rights, so in the absence you don't pay for that from which you have benefit, so then we are going to face tragedy of commons.

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Externality

Firms that make and sell paper also create dioxin as a by product in the manufacturing process. Scientists believe that once dioxin enters the environment, it raises the population risk of cancer, birth defects, and other health problems.

Is the production and release of dioxin a problem for society?

It is a negative externality. The paper firm will not consider the full cost of population they create in their production process, and consumer of the paper will not consider the full cost of the pollution they contribute as a result to as a result of their purchasing decisions. Therefore, the firm will emit too much pollution unless the government prevents

or discourages them from doing so.

⇒ The market failures examined in this chapter fall under a general category called externalities.

An externality arises when a person engages in an activity that influences the well-being of the bystander but neither pays nor receives compensation for that effect.

⇒ i) If the impact on the bystander is adverse, it is called a negative externality.

⇒ ii) If the impact on the bystander is beneficial, it is called a positive externality.

⇒ In the analysis of externalities we pay attention not only to consumer surplus and producer surplus. It is relevant the

surplus or benefit of the society (Bystanders).

- Buyers and sellers neglect the external effects on their actions when deciding how much to produce or buy, the market equilibrium is not efficient when there are externalities.

The government responds by trying to influence this behavior to protect the interests of bystanders.

Some examples of Positive and negative externalities.

Positive

Negative

i) Restored historic buildings convey a positive externality.

The exhaust from the automobiles is a negative externality.

ii) Research into new technologies provides a negative externality.

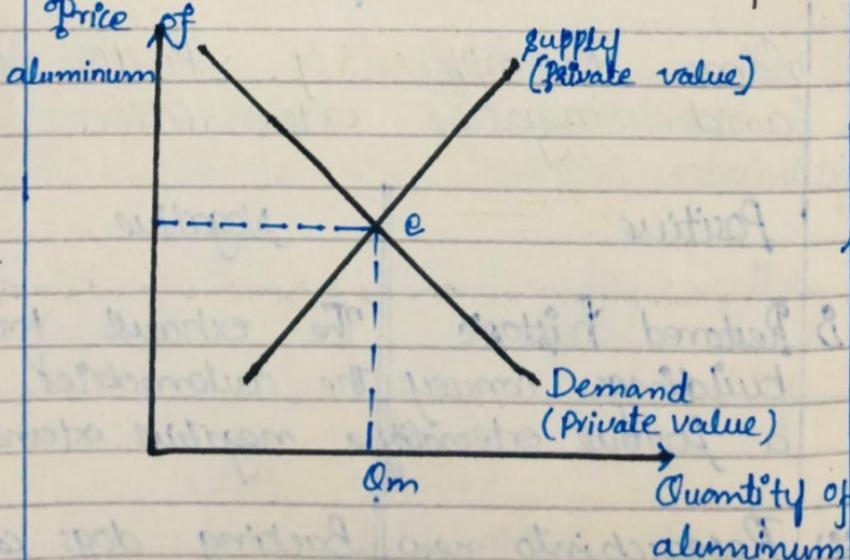
positive

Barking dogs convey a negative externality.

⇒ Externalities and market inefficiency.

In this section, we use the tool of welfare economics to examine how externalities affect economic well-being. The analysis shows precisely why externalities cause markets to allocate resources inefficiently.

⇒ Welfare Economics : A Recap



This graph shows the market supply and demand curves in the market

for equilibrium.

The supply and demand curves contain important information about costs and benefits.

- The demand curve reflects the value of Aluminum for consumers, as measured by the prices they are willing to pay.
- Similarly, the supply curve reflects the cost of producing aluminum.

In the absence of the government intervention, the price adjusts to balance the supply and demand for aluminum. The quantity produced and consumed in the market equilibrium shown as O_m is efficient in the sense that it maximizes the sum of producer and consumer surplus. So, there is no externality, therefore, the

market equilibrium is efficient.

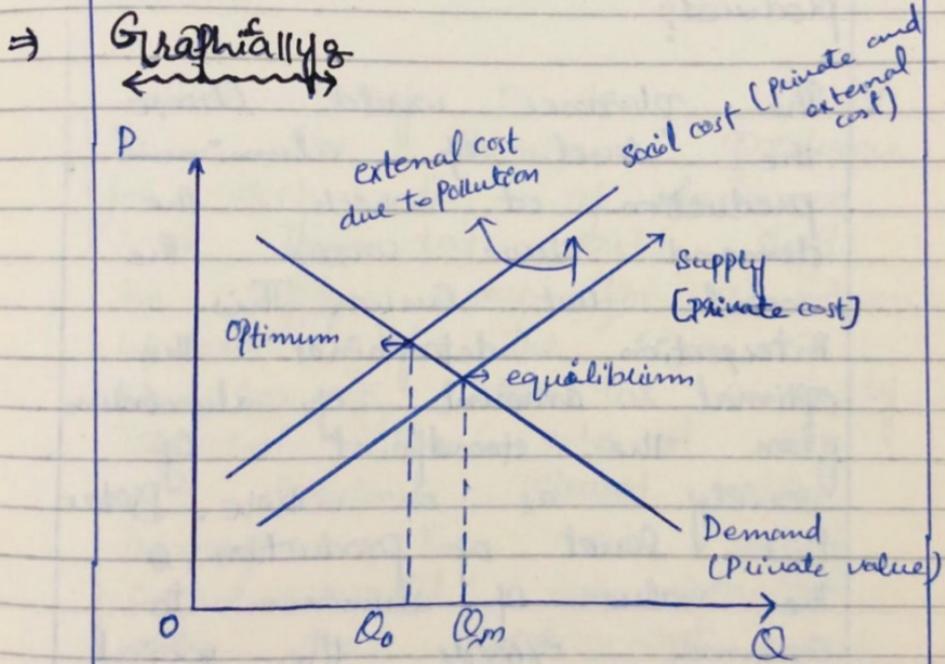
1) \Rightarrow Negative Externalities

So when we are talking about production so we automatically talk about supply curve.

Now let's consider that aluminium factories emit pollution. For each unit of aluminium produced, a certain amount of smoke enters the atmosphere. Because this smoke creates a health risk for those who breathe the air, it is a negative externality. How does this externality affect the efficiency of the market outcome?

Because of the externality the cost of society of producing aluminum is larger than the cost to the aluminum producers. For each unit of

aluminum produced, the social cost includes the private cost of aluminum producers plus the cost to those bystanders affected adversely by the pollution.



This graph shows the social cost of producing aluminum. The social cost curve is above the supply curve because it takes into account the external costs imposed on society by

aluminum production. The difference between these two curves reflect the cost of the pollution emitted.

What quantity of aluminum should be produced?

The planner would choose the level of aluminum production at which the demand curve crosses the social cost curve. This intersection determines the optimal amount of aluminum from the standpoint of society as a whole. Below this level of production, the value of aluminum to consumer exceeds the social cost of producing it. The planner does not produce more than this level because the social cost of producing additional aluminum exceeds the value to consumers. Thus, reducing aluminum

production and consumption below the market equilibrium level raises total economic well-being.

How can the social planner achieve the optimal outcome?

One way to do would be to tax aluminum producers for each ton of aluminum sold. The tax would shift the supply curve for aluminum upward by the size of the tax. If the tax accurately reflected the external cost of pollutants released into atmosphere, the new supply curve would coincide with the social cost curve.

In the new market equilibrium, aluminum producers would produce the socially optimal quantity of aluminum.

→ The use of such tax is called Internalizing the externality.

2) Positive Externalities

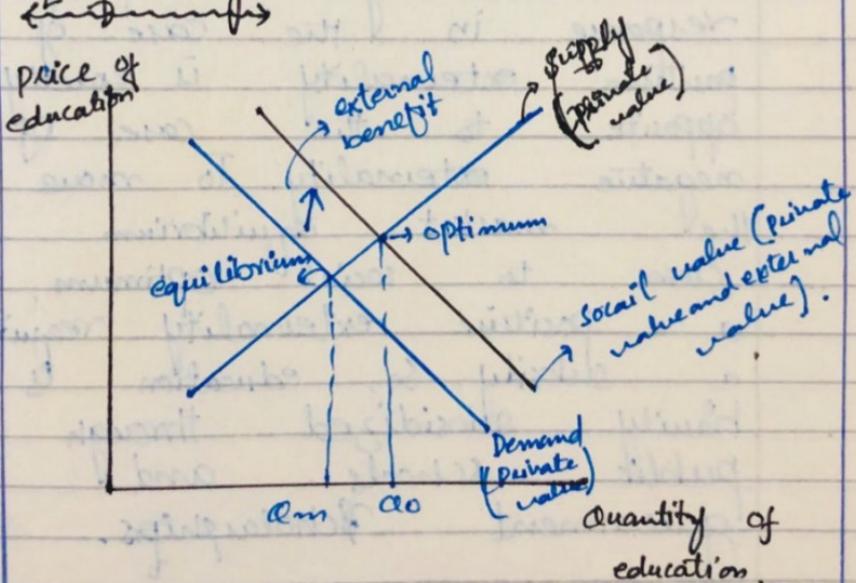
Now let's consider education which is considered as the positive externality.

- i) → To large extent, the benefits of education is private! The consumer of education becomes a more productive worker and thus reaps much of the wages as a form of benefit.
- ii) → Beyond however, education also yields positive externalities.
- * One externality is that a more educated population leads to more informed voters, which means a better government for everyone.
- * Another externality is that more educated population tends to mean lower crime rates. Literates with preliterates.

* A third externality is that a more educated population may encourage the development of technological advances.

The analysis of positive externalities is similar to the analysis of negative externalities.

→ Graphically



In the presence of a positive externality, the social value exceeds the private value. The optimal quantity, Q_{optimum} , is therefore

larger than the equilibrium quantity Q_m. Because the social value is greater than the private value, the social value curves lie above the demand curve.

Once again, the government can correct the market failure by inducing market participants to internalize the externality. The appropriate response in the case of positive externality is exactly opposite to the case of negative externality. To move the market equilibrium closer to social optimum, a positive externality requires a subsidy. So, education is heavily subsidized through public schools and government scholarships.

⇒ To summarize

i) Negative externality leads market to produce smaller

quantity than is socially desirable. To remedy the problem, the government can internalize the externality by taxing goods that have negative externality and subsidizing goods that have positive externalities, because the positive externality leads markets to produce a smaller quantity then is socially desirable.