

# Principle of Economics

## Public goods & common resources

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In this chapter, we will look at different kinds of commodities that exist in the marketplace.

In Chapter ten, we studied externalities and we said that externality problems can happen when market participants make actions without considering all of the consequences of their actions.

So that producers don't take into account all costs of production or consumers don't take into account all benefits of provision and consumption of the commodity in the marketplace.

In general, we can say that these problems happen when some resources in the real world don't carry a price tag with them.

One way to interpret Chapter ten is that because clean air or space on the roads didn't carry a price tag, anybody could use those resources without having to pay for them.

We can say that this property of commodities in the real world is the poor excludability of some resources.

Because clean air or space on the road is free of charge, market participants can use them and cannot be excluded from using them.

So we will distinguish different commodities in the marketplace by whether they are excludable, whether we can exclude people from consuming them or not.

And we will also say that another important property of commodities in the marketplace is whether the commodities are rival in consumption or rivaless in consumption or not.

Generally we will distinguish four kinds of commodities.

Private goods, public goods, common resources and natural monopolies.

So as I said, the first distinction that we can make is whether a commodity is excludable.

Generally if there is a price tag attached to consumption of unit of a commodity, we would say that commodities are excludable.

Only users who pay for the commodity get to use the commodity.

If users don't pay, they can be excluded.

Rivalry in consumption is the property whereas usage of the resource by one consumer prevents other consumers from using that unit.

So we would say that a commodity is a rival in consumption if usage by one consumer makes it the availability of resource to other consumers or the enjoyability of resource by other users smaller.

So we can draw this table where we have four, and we should, we can think of this table as a spectrum, where we can place different kinds of commodities in the market.

In one corner, we would have goods that are both excludable and rival in consumption.

These commodities carry a price tag.

Therefore they are excludable, it is easy to give unit of the commodity to people who pay and to not give it to people who don't pay.

These commodities are rival in consumption because one unit of the commodity can be only consumed by one person.

If one person eats ice-cream, other people cannot eat that unit of ice-cream.

But for some commodities, even though there is a price tag, these commodities may not be rival in consumption.

For example, with cable TV service or internet service or fire protection, these services carry a price tag but we can think that if another household gets connected to the cable TV service, that doesn't diminish the amount available to other households in the city.

And not let's look at some commodities that don't carry a price tag on them.

We can say that common resources are goods that are generally available for free so that it is difficult to exclude any particular person from using them.

And even among non-excludable goods, we can distinguish goods rival in consumption or non-rival in consumption.

We would say that fish in the ocean or congested roads are rival in consumption because another driver on a congested road makes the driving conditions worse for other drivers.

But for some services such as national defense or tornado siren, if there is another person in the country who is being protected by national defense or who can be warned by tornado siren that doesn't diminish the amount of the service available to others.

Okay? And so here the basic idea is that for any commodity in the real world we should be able to place them in one of these quadrants.

And another idea that I want you to keep in the back of your head is that this is not a binary table.

This is really a spectrum.

We can't have some commodities that are perfectly excludable and perfectly rival in consumption.

But for some commodities, we may not be so sure how, how much rival in consumption they are or how perfectly excludable they are.

So you should view this table as a spectrum where some commodities are on the edges of the table and some commodities might be closer to the middle.

We could look at some controversial examples and we could argue whether a particular commodity is a private good, public good, common resource or natural monopoly.

Let's look at an example.

For example, radio service.

Where would we put radio service in this table? Is radio service excludable? We may think that if radio service is available for free without any password, protection, if you don't need a special receiver to get radio signal, we could say that radio service is non-excludable.

Is radio service rival in consumption or not? It depends on whether we create any congestion or whether the fact that we are receiving radio service prohibits others from getting clear service.

With radio service, we might say that it is non-rival in consumption.

But maybe with, let's see, wireless internet, we could conclude that wireless internet is a common resource if it is available without any password protection.

But if the amount of downloading that we do prevents other people from downloading internet content.

Okay? So maybe with wireless internet, depending on the exact situation on our beliefs, we could place internet, wireless internet in this category or maybe in this category.

Okay? So generally, when some commodities are non-excludable, they're available for, effectively for free, a free rider problem arises because people can consume the commodity without paying for it.

In that case, consumers don't want to pay for the supply of the commodity, and perhaps free market would not provide this commodity at all.

Even though there is a demand, their consumers clearly want to consume and receive benefit from consuming the commodity, everybody wants to consume it for free and suppliers might not be willing to supply the commodity.

If there's no possibility of charging consumers for their usage, maybe the government could step in and provide the service for free.

And let's step back and think back to Chapter ten.

In Chapter ten, we assume that it was possible for the government to regulate number of drivers on the road or the usage of clean air.

So the government could impose a tax, a corrective tax on the amount of pollution cost.

If that's not possible, the government might choose to provide the service for free and without relying on free markets to provide this commodity.

In that case, the government must do cost benefit analysis.

It must compare the one-time costs of providing the service with the benefits received by all members in the society from consuming the service.

We can think that cost-benefit analysis is very difficult to conduct because there are no price tags attached to the commodity.

The government would have to ask consumers how much they are willing to pay for, how much they value consuming the commodity.

And generally if the government asks consumers about their valuation, consumers might have an incentive to lie.

They..If consumers are afraid that the government would ask them to pay something, they would not report their willingness to pay accurately.

Similarly, the government and even individual consumers might be unsure about the value of life, the value of consumer's time, the aesthetics of public good projects and so on.

So if the government is making a decision about the size of its military, the availability of public sirens and so on, the government faces issues in estimating these benefits and it may not be able to ask individual consumers about their valuation.

So to sum up, anytime a commodity is non-excludable, we can have the free riding problem.

If in addition, the commodity is rival in consumption, so we have a common resource.

We can have tragedy of the commons because the commodity is non-excludable so that people want to use a lot of the commodity.

And in addition, the commodity is rival in consumption so that everybody uses too much of the commodity, and as a result, too little is available for others, and so these resources might be exploited more than to their efficient level.

Right? The story of the tragedy of the commons is really the story of a negative externality studied in Chapter ten.

Too much of clean air is being used, too much of road space is used by selfish drivers.

To summarize, anytime goods are non-excludable, anytime the market doesn't provide clear price tags for commodity, we would have problem, between, if we want to match providers and consumers.

And we would have problem deciding on the efficient amount of the commodity provided.

In that case, the government can fix the problem by providing the commodity itself instead of relying on free markets and solve the efficiency problem.

As a final note, here, I want you to think that the government could only care about efficiency of the solution.

You know when the government decides to provide the commodity itself instead of relying on the markets that only achieves the efficient output level, maybe the efficient cost per unit of the commodity produced.

But this solution doesn't tell us anything about who pays for the service.

If we cared about fairness in the society, so if we wanted to assign the costs of the commodity to users based on their value of consumption, we would have a different problem.

Using the ideas in this chapter, we cannot, there's no telling how to allocate the cost of providing the service to different users.

In Chapter ten, it was assumed that we knew the externality effect of a unit of pollution.

In Chapter eleven, on the other hand, we look more generally at commodities where it is unclear what the costs of providing and benefits of providing the commodities are.