

Environmental and Resource Economics
Professor Sabuj Kumar Mandal
Department of Humanities and Social Sciences
Indian Institute Technology, Madras
Lecture 23
Coase Theorem and Incentive Design Part – 2

Welcome once again to our discussion on Environmental Economics and in our last class we were discussing about Coase theorem in the context of correcting market failure and externalities. We said that in presence of externality when market fails to efficiently allocate resources government intervention becomes necessary.

But Coase argued good that it is not required always, government intervention is not required always rather regulation is not to be imposed, if we can simply define and distribute property rights. So, if a property right is well defined and allocated among the polluters and the pollutee and if they can bargain costlessly then their bargain will lead to a situation wherein the society will get optimum amount of pollution.

But in reality, things do not work in that way, because in reality the number of polluters and number of pollutes is actually many, there are many polluters and many pollutee. In a situation when there are many polluters and many pollutee the Coasean bargaining becomes difficult to happen. Why? Because of this transaction cost what Ronald Coase pointed out.

It is difficult to identify the polluter, it is difficult to identify the pollutee as well. And since the number is huge you can understand that to have their bargaining there is required a huge amount of transaction cost. So, basically if you recall Coase also did not undermine the role of government intervention, rather he emphasized it indirectly. What is government's role?

(Refer Slide Time: 2:35)

Why is incentive required?

- Because there is a conflict between private interest and social interest

- ① Profit making private firm has no incentive to abate pollution
- ② A nation has very less incentive to curb its emission because other countries may not do so.
- ③ A consumer with tight budget has less incentive to buy environment friendly clean products when there are cheap and dirty products available in the market.

Incentives are given to align private objectives with the social one.

So, in Coase theorem, the question what I am asking, does Coase theorem undermine government's role? This is the question I am asking. Because apparently it may look like Coase actually undermine government intervention when he said without any government intervention this polluter and pollute, they can arrive at a solution which is socially desirable and socially optimum. But actually, he did not undermine government's role.

So, the answer is, the answer I will say no, the answer is no. Then what is government's role here? Number one, Who will assign property right? So, government only will assign property right. So, assigning property right and facilitating in their negotiation or bargaining.

So, government will assign property right and they will also facilitate the negotiation between the polluter and the pollute, these are the two roles. So, Coase never undermined this. But this framework was developed in a context assuming there is only one polluter and only one pollute who can easily identify each other and who can bargain or negotiate costlessly.

In reality in presence of n number of polluters and n number of pollute, so government intervention becomes necessary. And how does the government intervene? The government intervene in the form of providing incentives to correct this market failure. That is why what we are going to discuss today is basically incentive design.

What we are going to discuss? Incentive design, incentive design. What is the objective of incentive designing? Objective is correcting market failure in presence of externality and achieving socially optimum level of pollution. This socially optimum level of pollution is very important.

Because I have been telling you repeatedly that in economics, economists will never suggest a policy which will cut the pollution at 0 level that has never been the objective of the economist. Because economist they believe that society wants both clean air as well as marketable goods and services, we cannot survive only with marketable goods or only with clean air, that is why we need to have a optimum mix of these two.

That is why I am saying that incentives are designed to correct market failure in presence of externality and achieving socially optimum level of pollution. Now, the moment I say incentive. What is the idea of incentive that is coming in your mind? What is incentive actually?

By incentive generally we think incentive is some kind of reward or award, but that is not always the case. Incentive can be punishment as well. So, basically incentives are of two types. First type is reward, some kind of reward or award and this is called punishment. For example, I will give an example.

Emission tax is a punishment, I am imposing a punishment on the firm, polluting firms because the firms are polluting. And what is reward or award? Subsidy for adopting clean technology. So, it is not necessary that incentive is always some kind of reward or award that is one type of incentive other type of incentive is actually punishment and you can think about emission tax which is kind of punishment given to the polluting firms.

Now, why do we require incentives to be designed? What is the objective of incentives? The objective of providing incentive is to induce or motivate economic agents to behave in a specific way. And what is the assumption behind this?

The assumption what we make for this is rational people respond to incentives. In our principles of economics itself we studied one of the 10 principles was that rational people respond to

incentives that is why incentives are provided either in the form of reward or award or in the form of punishment to motivate the economic agents to behave in a specific way.

When I am providing incentive in the form of emission tax, I am encouraging the firms for pollution abatement because if they do not abate their pollution, they need to pay the tax. So, that means by imposing tax I am actually increasing the cost of environmental shirking.

That means the behavior to avoid pollution abatement. If you avoid pollution abatement, if you do not control your pollution then you need to pay tax. So, that means this type of behavior involves some kind of cost. So, that is why when I am providing incentives in the form of emission tax I am actually, I am actually increasing the cost of environmental shirking.

What I am doing, increasing the cost of environmental shirking, 's h i r k' to protect environment. Similarly, when I am providing reward or award in the form of subsidy, I am actually making it more attractive for the polluting firms to protect environment, by providing subsidy environmental protection becomes more attractive.

That means basically, why is incentive required, if you ask this question. Why is incentive required? Because there is a conflict between private interest and social interest. I will give you some examples. Example number 1, profit making private firm has no incentive to abate pollution. Why this is so?

Because if the firm goes for pollution abatement the cost has to be incurred by the firm itself. But the benefit would be enjoyed by the society at large, if that is the case why should a profit-making private firm go for pollution abatement, there is no incentive. That is why pollution abatement does not happen automatically and then government's role is to provide that incentive in the form of imposing tax. When tax is imposed now the profit making private player also has some incentive to correct pollution, otherwise the firm has to pay emission tax.

So, if the firm goes for pollution abatement the firm can actually avoid this emission tax and save some amount of money, that is why incentive is given. Similarly, a nation has very less incentive to curb its emission because other countries may not do so. Why should a country, a particular nation let us say India abate its own carbon emission if others are not doing it?

Because if India goes for emission control then India has to incur a huge amount of cost and others will enjoy at the cost of India, because it is not that if emission is going down in India the benefit would be only for India, no. When India's pollution is going down then others will also get a benefit of that and India is thinking if I go for pollution control then Nepal, Bangladesh, Japan, UK, US, Canada they may not be doing so.

So, that is why a particular country has very less incentive to go for pollution abatement thinking others may not go for such kind of activity. Then what is required? A global kind of arrangement or negotiation.

So, all the nations should come forward and have some kind of agreement that yes, we are forming an agreement that is why we see there are many agreements from time to time from Kyoto protocol to Paris agreement to Copenhagen, everywhere it is kind of agreement. That all of us collectively work towards correcting this emission and controlling global warming.

A consumer with tight budget has less incentive to buy environment friendly clean products when there are cheap and dirty products available in the market. Generally, environment friendly organic products are costly. So, when I am facing a tight budget how can I go for that type of product?

So, that is why consumer with a lower level of income, with a tight budget has very less incentive to go for environment friendly products when there are ample amount of huge supply of cheap dirty products in the market. Then the policy maker has to give some incentive that if you go for this environment friendly product, I will give you some kind of subsidy or you will get some kind of income tax benefit, so on and so forth.

What type of incentive you will give? That a different story altogether. But the point here is that means what we are trying to understand with all this example that at the private level, a private player has very less incentive to go for pollution abatement or to correct externality.

Incentive has to be given so that private objective, incentives are given to align private objective with the social one. When there is no disparity, no mismatch and no conflict between private

objective and social objective, then pollution abatement will happen. So, the role of incentive is to bridge the gap between private objective and social objective.