

Introduction to Environmental Economics
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Lecture – 58
Environmental Regulation and Basic Regulatory Instruments – Market Based
Instruments / Approaches – IV


Hello everyone, we are continuing with the earlier discussion that is the Market Based Instruments and here we are talking about the role of subsidies right. So, what we have discussed, we discussed what is the role of subsidies or how subsidies can be used as an instrument to internalize the externalities. Then in the earlier lectures we have already discussed how the taxes can also be used as an instrument and to internalize the taxes.

So, today we will be discussing a hybrid form of instrument that is the combination of both the taxes and the subsidies. And how this new form of instruments can be a mechanism for regulating this pollution control or you can say internalize the externalities that we will be discussing ok.

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Deposit-refund system (DRS)

- Robert Solow (1971) and Edwin S. Mills (1972) separately advanced the idea of a materials-use fee to be levied.
- This fee was seen to be equivalent to refundable deposit to encourage recycling.
- This is the combination of a tax (deposit) and subsidy (refund).
- This deposit-refund systems work well where a product is widely dispersed when it is purchased and used, but it is difficult to monitor, detect and observe environmental damage for its disposal.
- The very objective of the subsidy is to incentivise people to refrain from disposing of those items in environmentally damaging manner.



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So, in this regard, today we will be discussing a topic as you understand it is a mixture of tax and subsidy. So, that mechanism is known as the deposit refund systems right. So, now, we will be talking about what exactly is this deposit refund systems and how it is going to help in controlling the pollutions right.

So, as you understand this deposit refund system is a combination of the tax and the subsidy right. So, here tax is known as the deposits and this subsidy is known as the refund that is why the name is deposit refund system. So, this for therefore, if you take into account this mechanism the very idea we can pick from the writings of Robert Solow, in his 1970 article.

And under the writings of Edwin S. Mills it was his article was published in 1972 and both these literatures they are dealing with the idea of materials use fee right. That how we can put a fee if ah some kind of use over is there which is known as the material use fee right. So,

based on this understanding that this is the theoretical underpinnings of this deposit refund systems and we have this idea that we can also put the same.

So, that is why these the these two ideas propounded by both Solow and Mills; it was to seen to be an equivalent for this approach deposit refundable approach. And generally this kind of practice is very encouraged, in recycling the materials and recycling processes right. And basically you can say that, where you can apply this deposit refund system, where you can create this deposit refund system, what is the characteristics or what are the situations where you can put the system for controlling the emissions or the pollutions right.

So, we can say some of the characteristics must be available over there in a situation where right; where a product is widely dispersed right. So, when the product is purchased, it is widely dispersed maybe the product a product can be purchased in northern part of India or Southern part or Eastern or Western. So; that means, it is widely dispersed it is purchase during it is purchase it is widely dispersed.

And; obviously, after it is use it is very difficult to monitor right, where it is used and what happened then. And it is that is why and because of it is geographical locations on special variable it is a is a assigned to what they are, that is why it is very difficult to monitor and detect that what kind of repercussions are harmful effects it is it is creating on the environment right.


So, in order to observe this environmental damage, that the said ah product is impacting right, that is why we need to be careful about it is disposal. So, given this situation this deposit refund system can be helpful in recycling the product and that is why the environmental impacts can be minimized. So, that is why the very objectives of subsidy is used here right.


So, what is the very objectives of the subsidy to incentivize the people to refrain from disposing those harmful substances in the environment itself right. So, here in this deposit refund systems, we are taking to account both these taxes and subsidy in order to incentivize

the users right; to refrain from disposing this kind of products which are which are purchased and used dispersely in a very large scale of ah geographical locations ok.

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- Example: a subsidy is paid to consumers when they return and item to a designated collection point. 
- In case of some sectors, it may be difficult as well as costly for the regulator to monitor the activities of polluting companies-, i.e., dumping of waste in to the deep sea by the shipping companies.
- In this case, potential offenders should be required to leave an appropriate deposit with the environmental authorities.

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So, we can take some example that, when a subsidy is paid to a particular consumer then; obviously, it will be it will be serving as an incentives right. And here this consumers will be incentivized to return the product right or the particular substances or particular item to a designated collection point right.

So, here suppose say you have purchase something, it is new branded new branded. So, after it is use, you must know where the collection points are there where you can put the garbage over right. And during once you are putting your junk after the use of this particular material in this in this collection point then you will be getting some subsidy or money back ok. So, that is why this system is a kind of incentive for the consumers to return their garbage or

return their junk of out what is produced out of their newly used materials and they can deposit the items in a collection designated collection point.

And basically if you are talking about some sectors right, then we will be finding that it is very difficult to manage the and monitor this kind of polluting activities. So, for a regulator it is becoming a very difficult challenge that how to monitor this kind of activities right. So, for example, you can take into account dumping of waste right, dumping of waste into the sea into the deep of the sea right. And generally we are finding this shipping companies they do dump waste in the deep of the seas and no one is there to monitor.


And even though there is some regulating authority to monitor this, but it is a very challenging and difficult job right. It is very difficult to see in which part in which part of the sea a particular shipping companies has dumped some waste. So, in order to avoid this kind of a difficulty, this refund subsidy mechanism can help the consumers to get some incentive and that is why they can actually refund or return their waste in a particular designated collection points right.

So, in this case, the what will happen? The potential offenders, those who are going to the ship and or the shipping companies they are required to live an appropriate deposit right with the regulatory body or the environmental authorities right.

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- DRS can also be used to encourage the consumers to return back the used containers, bottles, packaging, products or their residues.
- It requires paying a deposit on the purchase of potentially polluting products, which is refunded when the products or their residues are returned for recycling or disposal.
- It aims to give a (financial incentive) for consumers to return the product or the wastes back to retailers or producers for reuse, recycling or disposal.



And therefore, this deposit report refund system it can be used by the by the consumers right. And the consumers will be will be getting incentive to return back the used materials, let us say containers or bottles or packaging items or any of the products and the residues once it is used right; it can be collected it can be deposited to a designated pool right.

So, therefore, this DRS system is requiring that we need to pay a deposit or the consumers whosoever using this particular item particular product, he is required to pay a deposit on the purchase of purchase of those items which are having potential polluting impacts or polluting effects right. And then, this payment or this deposit is refunded when the products or their residues they are returned for recycling or disposal centers right.

So, this is how you can say that the merit of this system lies that it is giving incentives, which incentives. So, it is a kind of financial incentives for the users right they will be interested to

return these products or the residues or the waste back to the retailers or the producers for recycling or reuse or disposing at a proper place where further treatment can happen right.

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Some Examples

DRS = ()

- A number of states in the US have enacted DRS for beverage containers to reduce litter and encourage recycling.
- Same is also practiced in Europe.
- Germany also has DRS on waste lubricating oil. Each year large quantities of waste oil are disposed improperly threatening the very components of the environment.
- New lubricating oil face tax and is channelized into a fund.
- This fund is then used to subsidize a waste oil recovery and reprocessing system.

(tax)

(fund)

(subsidize)

(waste oil recovery and reprocessing system)

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So, some of the other examples that we can take into account now, when we are talking about the examples we are finding this DRS system all through the globe right. So, it is not that this system is having its application for a particular sector, but across sectors and throughout the globe itself right.

We can find the examples in the United States itself and we are finding for individual state states some of the individual states in the United States itself they have enacted this deposit rate refund system for the sector beverage sectors right. So, in beverage sectors, in order to reduce the litter so, just like your bottle or packaging they this DRS system has been initiated and it is promoting the recycling itself right. And the similar practice it is also been

followed in European countries. And if you are talking about the Germany especially it has a well defined DRS system deposit report system refund system and it is applicable for the waste lubricating oil case right.



So, what happens every year a large quantities of the waste they are disposed improperly into the environment. And when the this oil are disposed this waste oil they are disposed; obviously, it is threatening the very environment including the biodiversity including the air, water and the soil itself right.


So, therefore, this when you are purchasing this lubricating new lubricating oil, so you are facing a tax over there so, this is a deposit. And this deposit when it is tax, it is in a form of deposit and this deposit is channelized into this special fund right. And then we will be wondering about how this fund what is the use of this fund, how this collected amount is utilized.

So, this fund now it can be used as is subsidizing the waste oil recovery. So, when you are recovering the waste oil or you are processing the waste oil right in a particular systems, then you are you can get this subsidy right; that you are ah recycling the particular waste amount ok.

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- DRS have been instituted for cars in Sweden and Norway. 
- New car buyers pay deposit at the time of purchase and can refund if these cars after use are sent to an authorised junk dealer.
- It can also be applicable for consumer products having hazardous substance like mobile batteries , laptops, electronic gadgets, etc. 

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And not only that this DRS has also been followed in case of cars for seizing cars, new cars in Sweden as well as Norway and you can know that who are the polluting countries and who are less polluting countries in the European continent itself. Then you can find that the things will be clear that how the legal system can also be an important mechanisms to reduce the cases of pollutions itself right.

So, here we are talking about two countries; the Sweden and Norway and here DRS system is also there for newly purchased cars in this two countries. So, when you are buying a new car, in each of in any of these countries you need to pay a deposit or tax right at the time of purchase. And this deposit you can get it refund right you can you can get it back if this oh used cars or the cars after you are use after a particular point of time, if you are sending to a

particular authorized junk dealer then you can get this amount of refund right and you can get it back.

So, when they see the kind of the kind of cycle for this fund so, here during the during the purchase of this new car you are paying this amount right. And after just say that you use this car for 5 years right, after 5 years you are now no more you are not going to use it anymore.

So, what you are doing it has become a kind of junk right. So, what you are doing, you are selling this or depositing this junk to a or to an authorized dealer right. So, if you are depositing this to an authorized dealer here after a point of time after the life of the car or after the use of your car, then you can get this money whatever the money you are you have deposited here during the purchase you can get it back ok.

So; that means, again it is a kind of incentives right. So, now, the user of the car they will be getting some incentive that yes the financial gain is there then we need to be careful instead of disposing this old used car here and there that are having a potential threats to environment it can be deposited to a particular authorized dealer and if you are doing so you can get the refund the deposit money back right.

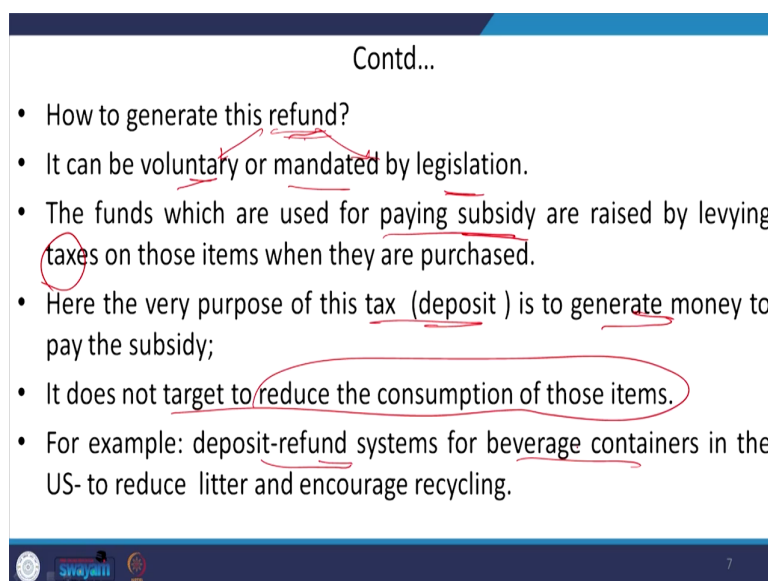
And similarly, this deposit refund system has a wider application it can be applicable for consumer products which are having this hazardous substances ok. So, we can take into account this waste management like your batteries we are using in our mobile phones or your laptops or some electronic gadgets even right. So, there these batteries they are containing some hazardous substances ok.

So, when the kind of deposit or tax is imposed on these on these items during it is purchase, then when you are again depositing or you are actually giving to some authorized dealer or these batteries or laptops or electronic gadgets after it is life, then you can get this money back right. So, it is a kind of incentives for the users and in that way it is going to create less pollutions or control the pollutions.

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- How to generate this refund?
- It can be voluntary or mandated by legislation.
- The funds which are used for paying subsidy are raised by levying taxes on those items when they are purchased.
- Here the very purpose of this tax (deposit) is to generate money to pay the subsidy;
- It does not target to reduce the consumption of those items.
- For example: deposit-refund systems for beverage containers in the US- to reduce litter and encourage recycling.



So, now, from this examples we can we can be clear that how we are generating this deposit or how to generate this refund itself. So, we are saying that so, the thing is that you are asking because when you are saying we need to pay some money back that is the deposited money they have given in terms of tax. So, it will be a very large amount funds are required. So, that is how the question is that how to generate this fund. So, that we can pay the users this subsidy.

So, this refund can be voluntary and sometimes it can be mandated by these legislations. So, it is compulsory. So, it can be voluntary right, it can be made compulsory through the legislation itself right. And the funds which are used for paying this subsidy right, they are raised by the taxes itself when they are purchased that we discussed about through different examples.

And here the very purpose of this tax is to generate the money or paying back in terms of subsidy itself right, see the very objectives of this systems. So, by doing this kind of process or exercise these DRS system is not targeting to reduce the consumption of those goods or those services or those materials, rather it is going to control or reduce the pollution itself right. So, example we have already taken deposit refund system for beverage containers in the some states in the United States and they are targeting to reduce the litter and encourage the recycling that is why this DRS system has been initiated in the beverage sectors.

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- If the deposit return is higher than the cost of deposit this can increase the incentive to return the item and reduce consumer resistance to the scheme where there is a long period between paying the deposit and receiving the refund.

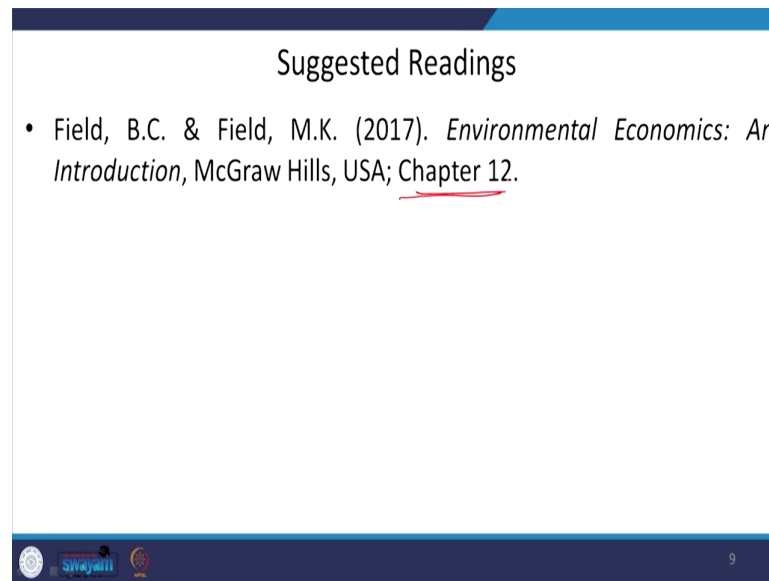
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And moreover, we can find from many observation we can find some very features that how this deposit return refund system be successful right. So, that it can be in this process of subsidizing can be sustainable ok, it can this process can be repeated without depending some other sources for finance.

So, from the observation we find that, if the deposit return is higher than the deposit amount right. So, the deposit return is higher than the deposit amount during the purchase right, then this increases the very incentives of the users to return the particular item and it also reduces the consumers resistance to this DRS scheme sometimes the consumers they also resist that why to pay right now because it is brand new and we do not know whether we will be able to deposit or use the particular material it is for it is life till the completion of the lives and maybe we can it is termed as second hand sells so, sometimes the situation forces. So, in this case the consumers will be resisting that this system is not actually friendly for consumers right.

But when you are finding this deposit return amount it is it is greater than it is higher than the deposit that the consumers have made during the purchase then this will be acting as an as an increase in incentives to return the particular item after use. And it is all it is also going to reduce the consumers resistance towards this scheme right.

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Suggested Readings

- Field, B.C. & Field, M.K. (2017). *Environmental Economics: An Introduction*, McGraw Hills, USA; Chapter 12.

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So, for this particular system market based instrument depository refund system which is a combination of tax and subsidy, you can follow Chapter 12 of this book *Environmental Economics and An Introduction* right ah. So, in the next class we will be talking about the other market based instruments for controlling the environmental pollutions or reducing the and the pollutions. So, they are the liability and the emission trade. So, this two mechanisms are left that will we are going to discuss in the next lecture.

Thank you.