

13.02.24

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Date _____

Page _____

Unit 3 :- Environment economics

(Chandana Ma'am)

Common and control approach (CAC) (Non-market instrument)

A govt. authority tell a polluting agent how much population it can emit and what particular production method to be adopted for reducing emission. This method in which the govt. agency tell a firm or a individual how much or by what method emission must be adjusted is called CAC approach.

~~CACA~~ When the US started passing comprehensive emission law in the late 1960's and early 1970's, a typical law specified how much pollution could be emitted out of a drain pipe and impose penalties if that limit was exceeds. Other law require the installation of certain equipment - for eg:- on an automobile tail pipes, to reduce pollution. This type of law which specify allowable quantities of pollution and which may detail pollution control technologies must be used, fall under the category of common and control regulation. In fact CAC regulation require that firms increases their cost by installing anti-polluting equipment, firms are then require to take social cost of pollution into account.

C and C regulation has been highly successful in protecting and clearing up the US environment. In 1970 the environmental protection agency (EPA) was created to oversee all environmental law. In the same year the clean air act was enacted to address air pollution. Just 2 years later in 1972 congress passed and the president sign the far-reaching ~~CACA~~ Clean Water Act. This CAC environment law ~~was~~ their amendment and updates have been largely responsible for America's cleaner air and water.

in recent decade.

There are some advantages and difficulties with CAC environmental regulation.

Advantages of CAC approach :- A CAC approach in policy is used for several reason. It has been propose that by simply imposing fixed standard with the force of law behind them, CAC can response more quickly to activities. It also has benefit politically as a regulator.

Disadvantage of CAC approach :-

- ① CAC regulation offer no incentive to improve the quality of the environment beyond the standard set by a particular law. Once the CAC regulation has been satisfied polluters have no incentive to do better.
- ② CAC regulation is inflexible. It usually require the same standard for all polluters and often the same pollution control technology as well. This means that CAC regulation draw no distinction between firms that would find it easy and inexpensive to meet the pollution standard or to reduce pollution and firms that might find it difficult and costly to meet the standard. Firms have no reason to rethink their production methods in fundamental way that might reduce pollution even more and at lower cost.
- ③ CAC regulation are written by legislators and the EPA and so they are subject to compromise in the political process. Existing firms often argue that environmental standard should apply to them, only to new firms that wish to start production.

(Chandana Ma'am)

Q:- What are market based instruments and what are its types?

Ans- MBIs also refer to as market based economic instrument or economic instrument are tools for govt. to implement environmental policy. These tools affect estimates of cost and benefits of alternative action upon the economic agent or its put it more simply if a tool affect the cost or price of goods and services in the market, then it is a market based economic instrument. This definition focus on the economic signal and incentive the instrument provide. If it changes the cost or price of a goods (for eg- plastic bag), service (for eg- waste collection), activity (for eg- waste dumping), input (for eg- material), or output (for eg- pollution) then it is a market based instrument.

MBI can classified in different way for eg- according to where sector of implementation (for eg- transport, energy) or by environmental medium (for eg- water, air). Alternatively the European environmental agency (EEA) has classified MBIs into five main types based on their aims and functioning :-

- ① Environmental tax (also environmentally related tax) that have been design to change price and thus behaviours of producer and consumer as well as raise revenue.
- ② Environmental charges that have been design to cover the cost of environmental services and are abatement and measure such as waste water treatment and waste disposal.
- ③ Tradable permits that have been design to achieve reduction in pollution such as emission of CO₂ or use of resources such as fish quota in the most effective way through the provision of market incentive to trade.

4/1/20

classmate

Date _____

Page _____

- ④ Environmental subsidies and incentive that have been design to stimulate development of new technology to help create new market for environmental goods and services including technologies, to encourage changes in consumer behaviour and to temporarily support achieving higher level environmental protection from companies.
- ⑤ Liabilities and compensation scheme that aims at ensuring adequate compensation for any damage resulting from dangerous activity to the environment and provide prevention and re-instatement.

18.02.24

CLASSMATE

Date _____

Page _____

(Chandana Ma'am)

Q:- Explain the main principle in using market based instruments?

Ans- The main principles in using market based instruments are :-

- a) Environmental effectiveness ^{most} the important point to underline is that any environmentally related MBI should cause change in consumption or production pattern which will lead to reduce environmental burden. If an instrument fails to do that, it should be considered whether to change or even abandon the instrument.
- b) Economic efficiency one of the advantages of MBIs is their effectiveness on every unit of population. Taxes encourage both static (abatement at ^{the} lowest-cost source) and dynamic (continuous reduction of pollution abatement costs and pollution levels) efficiency gains.
- c) Equity / income distribution policy makes need to consider the impact of such taxes also on sensitive groups such as low-income households or pollution intensive, trade-exposed businesses. Lower tax rates or exemption are sometimes put into place to limit impacts on such groups. Generally it is advised not to make assumptions exemption into tax system itself, but rather use other policy instrument to cover the distributional problems.
- d) Competitiveness the aim of economic instruments (especially taxes) is to make activities with higher environmental impact less profitable in an economic sense. It means that, at the enterprise level, there are always companies that are better off than others - those who pollute less.

or are more efficient in their resource use. The competitiveness issue arises more sharply at a sector or national level, where taxes or tradable allowance schemes imposed may have a negative impact on international efficiency competitiveness (if the instrument is implemented only at local / national level).

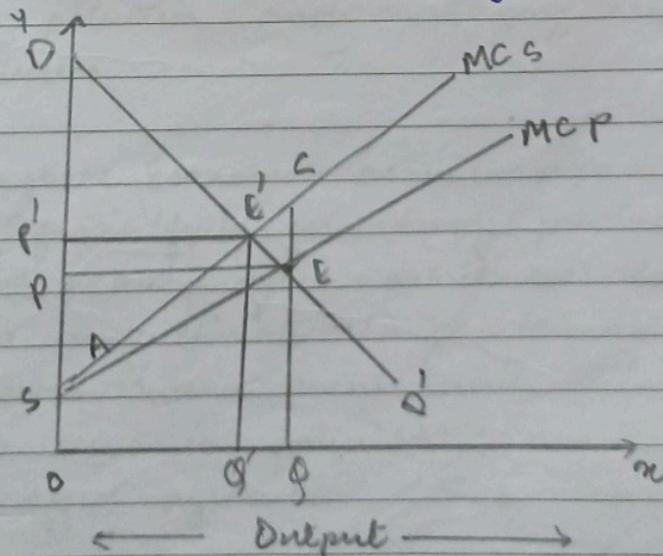
- e) Acceptance, stakeholder involvement the acceptance of environmental taxes ~~was~~ is in good correlation with awareness about environmental problems in society. Opposition to ~~the~~ environmental taxes may be caused by not enough information about the purpose of the tax, little trust of ~~an~~ assurance in how the revenue is used, fear of loss of competitiveness or other reasons. Well-design taxes are highly transparent in terms of their coverage and costs. It should be clear what is taxed, which polluters are exempt, and what the cost to polluters will be per unit of pollution generated.

19.04.24

(Chandana Ma'am)

Q:- Explain the Pigeonian tax as economic instrument of controlling pollution?

Ans- The price based instrument was first suggested by Pigou in the form of tax and subsidies to deal with detrimental and beneficial environmental externalities in production and consumption. They are pollution taxes on a polluting commodity either through its production or consumption or on polluting input. Pigou argue that for the imposition of taxes on generators of pollution since the social cost of pollution is an excess of the private cost to the polluter. The govt. should intervene with a tax making pollution more costly to produce then polluters may produce less pollution. This tax has come to be called a pigeonian fee or pigeonian tax. A Pigeonian fee is a fee paid by the polluters per unit of pollution which is exactly equal to the aggregate marginal damages caused by the pollution when evaluated at inefficient level of pollution. The fee is generally paid to govt. This has been explain with the help of following diagram,



In the above figure DD' is the market demand curve, MCP is the private MC curve MCS is the social

marginal cost curve. At the private optimum E where $MC_p = \text{price} = P$ the marginal social cost is higher than marginal private cost by the amount EG , the social optimum at E' where $MC_s = P'$. The MC_s is the sum of ~~MPC~~ marginal private cost g' and the external cost (AE'). Therefore the Pigouvian tax per unit of output is equal to AE' . It is assumed that the pollution per unit of output is constant and hence the tax on the output is equivalent to a pollution tax. When production is at E the net social welfare is the sum of consumer surplus and producer surplus and minus the external cost i.e. $SE'D < SEC$. The social welfare at E' is D which is higher than one at E by $E'EC$. The producer bears the external cost and the consumer pay a higher price P' instead of P .

(Chandana Ma'am)

Q:- Explain the different economic instruments for pollution control?

① Price rationing or taxes

(a) Emission charge :- This are fees on the discharge of polluted air or water or on the social or on generation of noise. This charge design to reduce the quantity or improve the quality of pollution inputs by making polluters pay atleast part of the cost of the harm. Emission charge the producer and incentive to develop and adopt newer and better pollution control technology as a means of bring down the charges they must pay.

(b) Ambience charge :- This charges combines penalties and reward for hitting beating a specific level of total ambient consumption. The ambience charge scheme has its part unit or subsidy based on the deviation from some ambience standard. As a lumpsum penalty for non-achieving the standard.

(c) Product charge :- An alternative form of price rationing is product charge. It is an indirect attempt to influence behaviours by putting a charge directly on the product or input, i.e. pesticide is the cause of the problem. Product charge are fees or tax levied upon output and input that are potentially hazardous to human or the environment when used in production or when they are the containers that carry them become wastage later.

(d) Subsidies :- They are form of the financial assistance offered to a producer by regulator. Subsidy can be used as an incentive to encourage pollution control

or to mitigate the economic impact of regulation by helping firm's to meet the compliance cost. Subsidies normally take the form of grant loan or tax allowance.

(2) Liability rules :- They are set in such a way that this is an incentive for producer to follow some prescribed mandate, technological restriction or acceptable behaviour.

(a) Non-compliance ^{once} fees :- If total ambient concentration exceeds the target standard at a common site the regulator select atleast one producer randomly find him. The regulator then redistribute a portion of his fine minus the damage to society from non-compliance back to the other producer.

(b) Deposit refund system :- Under this scheme a charge is levied on a product at the point of payment when pollution is avoided by returning the product or its polluting component to a specified collection stream the charge is refunded. This economic incentive have been used most often for drinks containers, batteries and packaging etc.

(3) Quantity rationing *

(a) Marketable permits :- D.H Sales (1968) suggested an alternative to the pollution tax a system of pollution right for the management of the environment. He has proposed that property right be assigned to environment to the environment and offer for sale to the highest bidder. In this process a market for pollution permit is created in which trading is in permitted take place to the point at which the

aggregate supply of permit is equal to aggregate demand of the permit and the equilibrium permit price is equal to the MC of abatement to each firm. This system like tax can achieve the specified environmental target at minimum cost.

Q1: Explain the main concern about using MBI?

Q2: State the incentive to sources to comply with environmental regulation.

Ans-1 However, although there are many successful examples of using MBIs, there are studies indicating that MBIs are not always the best instruments for achieving change in behaviour. There are various reasons or situations where MBIs may not succeed and regulatory and other instruments might be more successful in achieving the objectives :-

a) Emergency conditions :- When problems have severe implications, emergency conditions arise, and behaviour needs to stop immediately, direct bans may be more appropriate.

b) Excessive monitoring costs :- When there are a large number of very small transactions (e.g. emission trades) monitoring costs may be very high so regulations may be a better fit.

c) Fragmented authorities :- Where authority to set and enforce regulations is highly fragmented across institutions, oversight of market based instruments might become quite difficult.

d) Equity/distributional issues :- Increasing prices to recover their full resource cost will impact on ~~cost~~

consumer groups where they cannot switch to alternative goods and services, and this may be of concern where they are sensitive groups such as low-income households.

- e) **Illegal activities** :- MBIs can encourage cost-avoiding damaging activities, such as illegal waste dumping.
- f) **Strong opposition** :- Where political power and interest group factions remain strong, policy makers need to judge the most prudent course.
- g) **International competitiveness** :- Taxes on industrial inputs increase the cost of production. If the domestic production with the foreign producers (without the tax) then it may harm the competitiveness of domestic firms.

Ans-2 Firms may voluntarily comply with environmental standards due to various reasons. The managers may care about the firm's public image and therefore voluntarily works towards meeting the standards. Firms may feel that compliance is simply the right thing to do because of the operation of social norms.

Incentives provided by ~~the~~ the environmental agency to the firms can also help explain voluntary compliance. For eg, the agency can discriminate between the firms found to be in compliance and the firms not found to be in compliance during the last inspection are subjected to either higher monitoring probability or higher fines. This scheme allows the regulatory agency to increase the proportion of firms in compliance for a given level of monitoring or penalties.

27.02.24

(Chandana Ma'am)

Q1:- Explain the instrument of mixed pollution control?

Q2:- Explain the effect of penalty and emission?

Q1:- Define pollution credit?

Ans- It means tradeable permit issue to polluters firm for emitting below and established standard. If the polluter actually produce pollution below assign level that firm become eligible to receive credit. If a polluter cross the limit or standard fixed by regulatory authority he will be penalised.

Q2:- What is emission reduction credit (ERC)?

Ans- ERC are cap and trade meaning there is no said limit on the maximum allowable on the within a regulated area.

Q3:- Define capped allowance system?

Ans:- Capped allowance system or capped trade system set a maximum allowance.

Q4:- Mention the type of trading program currently used in US?

Ans- Emission reduction credit and capped allowance system.

Q5:- What is environmental subsidy?

Ans- It is define as "any measure that gives price for consumer below market level or for producer above market level or that reduce cost for consumer and producer."

Q6:- What is deposit refund systems?

Ans:- A DRs or advanced deposit fee is a charge on a product when purchase and a rebate when it is return.

(CrPP)

Q7:- Define green public procurement?

Ans- CrPP is "a process whereby public authorities seek to procure goods, services and works with a reduced environmental impact throughout their lifecycle when compare to goods, services and work with the same primary function that would be procure".

Ans-1 MBIs are seldom used ~~independently~~ individually and are often used as part of a package of a number of MBIs or they are combined with regulatory (command-and-control measures). The main reason for using an instrument mix is that in most cases environmental problems are of multi-aspect nature and no one single policy instrument can achieve the goals set alone. For eg, in order to achieve the goal of reducing CO₂ emissions, govt may use explicit and implicit carbon pricing as well as create energy efficiency standards for housing and vehicles. Using complementary MBIs can also reinforce their incentive effects. For eg, ETS can be complemented with energy taxation. Supplementing ETS with CO₂ taxes can help limit compliance-cost uncertainty by giving polluters the opportunity to pay the pre-determined tax instead of buying a tradable permit, the price of which can be rather volatile at times. In most cases policy mixes are not initially designed as such but rather individual instruments are created separately and over time new instruments are added to address the inefficiencies of the existing policies.