ENVIRONMENTAL CHALLENGES IN THE PROCESS
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THE ROLE OF ECONOMIC INSTRUMENTS IN THE IMPLEMENTATION OF ENVIRONMENTAL POLOCIES: THE CASE OF THE BALTIC REGION

Approaches to environmental policy

Like any other policy, an environmental policy has to compromise between different demands and expectations, many of which often in conflict with one other. **Conservationists** would like to protect natural habitats from economic development. On the other hand **industrialists** demand that protection measures do not hamper growth and do not impose excessive burdens on firms. **Social critics** are concerned with distributing environmental protection costs fairly between groups and strata. In this regard three notions are crucial: effectiveness; efficiency; equity.

A policy is called ***effective***, if it solves the problem it was supposed to. Effective policies are those which clean the air, restore lakes and save species from extension. The question of effectiveness does not refer to the costs which such policies may imply, nor does it take into account any social problems, which may arise as a result of their implementation.

In contrast, economists are concerned with the idea of ***efficiency***, which attempts to take into account both costs and effects of a given policy or action. This implies that effects are made commensurate with costs by evaluating the former in the same units as the latter. A policy is said to be efficient, if its costs are justified in terms of its effects, or to put it more precisely – if it maximizes the net effects of the costs. As in the case of effectiveness, the idea of efficiency leaves aside the question of fairness, that is who pays the cost, and who benefits from the effects.

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Unlike effectiveness, however, efficiency addresses the question of whether a policy is worthwhile. Thus an efficient air quality policy raises emission abatement requirements as long as the incremental (marginal) benefits resulting from the cleaner air exceed the costs of the cheapest alternative to meeting such requirements.

Efficiency is a difficult concept to apply, as environmental benefits are often difficult to evaluate in economic terms. This is why a somewhat less stringent concept of ***cost-effectiveness*** has been in common use. A cost – efficient policy achieves any given effect in a least- cost way. Thus, if one objective is to clean up a lake, of all the effective policies the cost effective policy will be the one that restores the lake to life at the minimum cost. It should be stressed here that neither effectiveness nor cost efficient per se provide a criterion for judging whether a policy is worthwhile pursuing, that is – in the example above – whether the lake should be restored or should the economy's scarce resources be spent on something else. Efficiency provides such a theoretical criterion but, of course there are additional aspects of environmental policy that have to be taken into account.

Fairness has been another important issue raised in connection with environmental policies ever since such policies started to be formulated and implemented. There is no universally accepted definition of fairness and economists prefer to talk about ***equity*** whenever they discuss the distribution of costs and benefits among the parties concerned.

Making a policy equitable means balancing costs and benefits across all the parties concerned by appropriately distributing benefits and/or letting beneficiaries pay an adequate share of the costs. For instance, a policy aimed at biodiversity preservation will be judged inequitable, if its costs affect the local populations in the areas adjacent to protected habitats – for example, by constraining development opportunities – without offering them a fair share of the benefits of conservation.

As seen this brief overview above, environmental policies can be judged from several different perspectives. Economists tend to focus on efficiency questions. Whilst difficult to answer, for two reasons these are extremely important.

Firstly, it is not sufficient to design a set of cost – efficient policies to address environmental problems, such as specific levels of acid- rain abatement, solid- waste disposal and so on. Even though each of these problems should be individually solved in a least cost way, there is no reason to believe that the composite outcome will be what people would prefer to have, given the costs to be borne. It might turn out for instance, that euthropication control becomes too strict in relation to waste disposal measures. And that it would be better to relax the euthropication

controls a little and to switch the resources saved in this way to improve the sustainability of the waste disposal system.

Secondly, the combined society resources spent on the environment as a result of the series of cost – efficient sectoral policies might turn out to be too little or too much in comparison with what was spent on meeting other needs.

Optimizing Economic Policy

If economists were to advise on designing environmental policies, the most likely suggestions would be to **achieve efficiency by maximizing net aggregate benefits**. In principle, this approach does not have to contradict equity considerations. For if a policy is efficient, it is always possible to distribute its net benefits in such way as to make everybody better off than under a non- efficient scenario.

However, studying real-life policy cases proves that the distribution of costs and benefits is most often ignored. Not only might this imply that the benefits do not match the costs borne by various individuals, but also that some individuals are sometimes even worse off.. This is a typical outcome of the of many policies aimed at increased efficiency – especially in countries without social security arrangements. Thus the **core of efficiency** – that is the possibility of enjoying the maximized sum of net benefits – **turns out to be a privilege distributed** in a not necessarily fair way. Despite that, many economists have viewed efficiency as an ideal reference point for designing sound environmental policies. If a policy is to be efficient, it should aim at equating marginal costs (MC) to the marginal benefits (MB) of environmental protection. The MB = MC criterion has largely remained only a theoretical reference point for various policy instruments. One reason why policy makers have not followed this economic prescription is that any estimates of the marginal costs and marginal benefits are affected by a wide margin of uncertainty. For different reasons, however, neither benefits nor costs can usually be known with accuracy sufficient to adopt the MB = MC rule as a practical guide. The criterion that marginal costs for abating different sources of pollution should be equal, the **MCi = MCj** rule, is easier to apply since it requires cost data only.

Theoretically, it is possible to introduce any policy instrument in an economically optimal way. Nevertheless, environmental standards and other regulations are most often justified in non- economic terms. As a result, they are unlikely to be sufficient or even cost-effective. For instance, an efficient pollution permit should allow emissions up to the point where the marginal abatement costs equate to the marginal damage caused by

the remaining (unabated) pollution. In real life, pollution permits are issued following an evaluation which obviously takes into account some cost and benefit considerations although in a very rough way.

Similarly, a cost – effective pollution standard should allow every source to emit an amount, such that the sum adds up to a total which does not exceed the policy objective, while letting all sources equate their marginal abatement costs. In real life, standards are usually independent of the number of sources they apply to. Thus, the more polluters, the less likely is the achievement of an environmental objective; thus standards may fail to be effective. Moreover, the same standards applied to various emission sources typically imply different marginal costs and thus fail to be cost effective.

Choosing policy instrument

Apart from standards and traditional permits, a number of economic and market oriented instruments are also applied. Environmentalists know however there are always two sides to a problem. Indeed a lot of destruction is observed within the framework of market forces both in the developed and the less- developed world. It is, therefore, necessary to investigate as objectively as possible what can be expected from markets, what information they can successfully process and where they may do more harm than good.

The distinction between **scale and allocation decisions** has proven to be a useful methodological starting – point. To regulate the environment means to decide to what extent a given environmental resource could be used and what portion of the resource should be allocated to any of its potential users. The first decision addresses the **scale aspect**, the second the **allocation.**

These two aspects can also be addressed separately. But they can also be treated jointly by starting with the allocation of tasks and arriving at the overall scale as a result of individual contributions. Also, market forces can be utilized to determine either of the aspects. However, there is a clear distinction between the role which markets are capable of playing in either case.

This separation principle is well illustrated by so called marketable permits. They differ from traditional pollution permits in that, under certain conditions, they can be treated as commodities, that is, bought and sold. The volume of all the permits issued by the government agency determines the scale aspect of a policy. The allocation, however, is left to market forces either by auctioning the permits, or by making them transferable after having them distributed in an administrative way.

Marketable permits utilize market forces in the exact domain where the latter can play an outstanding role and keep them away from where they might sometimes bring more harm than good.

The reason why marketable permits can achieve cost–effectiveness is that they go to those who are the most willing to pay for them, that is, to where environmental protection would have been most expensive. On the other hand, those who sell these permits do not need them since presumably they can afford environmental protection at a lower cost than the permit price. In this way marketable permits stimulate the undertaking of protection measures where they are cheap and help to avoid them where they are costly.

Pollution taxes, are perhaps, the best known economic instruments designed for environmental policies. In principle, by raising such taxes to the level of marginal benefits(MB) from reduced pollution we can achieve economic efficiency. This is because a tax whose rate is MB would motivate polluters to abate, as long as they incur marginal costs (MC) lower than the tax rate. Thus such a tax makes ii possible for the MB = MC rule to work. A pollution tax charged at this optimal rate is called a Pigou (Pigouvian) tax after the name of an economist who analyzed pollution taxes in the 1920`s.

The choice between marketable permits and other economic instruments, such as charges or taxes, is a choice between assigning priority to the economy or the environment. With taxes, in an uncertain world where the exact values of MB and MC are not known, there is less likelihood of being surprised by the financial outcome of environmental policy. On the contrary with marketable permits there is less likelihood of being surprised by the scale of protection even though its costs are sometimes difficult to predict.

The cases of Sweden, Poland and Lithuania

A major role, which economic instruments are supposed to play, is to lower the cost of achieving environmental objectives by efficiently or cost – effectively allocating abatement tasks. This can be achieved either by distributing marketable permits or levying Pigouvian taxes.

There are almost no practical applications of Pigouvian taxes. The sulphur dioxide and nitrogen oxide taxes adopted in Sweden in 1991 provide perhaps the only two exceptions to this rule. Set at 40 SEK/kg (~5.30 USD), the Swedish charges are quite unique. At first glance, the sulphur charge seems to be biting. It was established at this high level only after the sulphur emissions problem had been largely solved in Sweden. Emissions is fairly low and the tax is not a heavy burden on

polluters. Nor does it provide substantial revenues for the budget. The nitrogen charge is a different story. Nitrogen oxide emissions continue to be high and difficult to abate (road traffic). The Swedish charge is levied on power plants only. The money collected is paid back to the polluters, yet in proportion to the electricity sold, not to the pollution emitted. The charge therefore acts as a Pigouvian tax levied above a certain threshold limit. The limit is the average emission per unit of electricity produced. Those power plants that emit more than average are net payers. Those that emit below the average receive more than they pay.

In accordance with what is expected by economic theory, the Swedish nitrogen tax has turned out to be an excellent tool of environmental policies. It vividly depicts the fundamental problems with implementing ecological taxes. These taxes cannot provide sustainable revenues as they instantly erode their tax base, namely polluting.

In other countries pollution taxes either do not exist or they are set at much lower levels. Lithuania and Poland are examples of countries where hundreds of pollutants, wastes and other forms of environmental degradation are subject to fees.

In Poland these rates are high, usually higher than in western Europe. For instance the sulphur dioxide and nitrogen oxide fee is 0.24 PLN/ kg (~0.09 USD/kg). This is almost two orders of magnitude less than in Sweden, but still higher than in virtually any other country. Given the conditions prevailing in Poland, it is estimated that the theoretical Pigouvian rate of the sulphur dioxide tax should be around 1.50 PLN/kg. Does the existing lower rate play any useful role at all thought?

All together Polish environmental fees produce slightly over 1 bln PLN a year. They raise special purpose funds, which operate independently of the state budget and their total revenues are too low to be a serious alternative to traditional taxation. Nevertheless, for environmental protection, which in the recovery phase needs the support of a public fund, this money is substantial. It is because of the availability of this money that Poland has enjoyed visible progress regarding the state of the environment, especially when compared with the rest of Central and Eastern Europe. Presently in Poland environmental funds finance around 40% of environmental investments.

In Lithuania, virtually all pollutants emitted into the air or water are subject to fees whose nominal rates are rather high. These rates are somewhat lower than in Poland, but also higher than almost anywhere else. However, because of the system of waivers and lowered rates for certain source categories, the actual payments of firms are rather small.

In both the Polish and Lithuanian systems, the revenues from pollution charges are at least partially channelled to special purpose funds and earmarked for environmental protection.

If fees are set below the Pigouvian levels, the pollution fees do not perform the role envisaged by economic theory. Instead they play a role of raising revenues that later could be spent on the environment. That is why under these circumstances marketable permits seem to be a reliable instrument in abating pollution at a time of rapid structural changes. Marketable permits actually create a new market and do not require special administration, while taxes do. Of course the lack of an adequate legal framework hinders the implementation of marketable permits in everyday practice. However, the experiment carried out in Poland in 1991 serves as an excellent example of the application of marketable permits.

Pigouvian taxes and marketable permits do not exhaust the list of market – oriented policy instruments. All European countries have implemented at least some economic instruments. Their role is to lower the cost of meeting environmental requirements by offering incentives, instead of changing specific actions, technologies or equipment. While it is possible to demonstrate the savings thus obtained, in general, achieving efficiency is rather unlikely. To achieve efficiency by equating MC and MB, policy makers ought to rely either on Pigouvian taxes or on marketable permits.

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