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§ School of Economics, The University of Queensland, Brisbane QLD 4072, Australia.
E-mail: c.tisdell@economics.uq.edu.au

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For more information: write to Professor Clem Tisdell, School of Economics, University of Queensland, Brisbane 4072, Australia.

ECONOMIC POLICY INSTRUMENTS AND ENVIRONMENTAL SUSTAINABILITY: A SECOND LOOK AT MARKETABLE OR TRADEABLE POLLUTION OR ENVIRONMENTAL - USE PERMITS

Abstract

There has been a recent tendency to extol tradeable or marketable pollution permits or similar permits to use or exploit some natural resources, such as fish. They are often seen as a very effective way of maintaining environmental conditions in a desired way. However, considerable care is required in adopting such systems. If they are inappropriately designed, the government will lose its flexibility to control the state of the environment. Permits which give their owners absolute rights to emit certain quantities of pollution in perpetuity or entitle holders to use or appropriate a particular quantity of a natural resource in perpetuity can cause particular problems for government. They can for example, involve expensive buy-back schemes. There are, however, ways around the problem. Furthermore, holders or rights may have to pay fees to cover enforcement costs. Where tradeable permits have a very long-life, the question arises of how they should be allocated and whether those allocated these rights should be allowed to capture the rents. As discussed, changing ambient conditions may have to be allowed for in designing systems involving tradeable permits.

1. Introduction

The introduction of marketable environmental-use rights, such as pollution rights, are considered by many to be an efficient way of satisfying environmental standards e.g., air and water quality standards, or of achieving sustainable use of natural resources, such as fish stocks, to which there is some degree of common access. It is frequently argued that they result in environmental standards or targets being met at minimum cost because the market will ensure that rights to use the environment are distributed between users so that the marginal net benefit of each from this use is equal (Dales, 1968). Consequently, social benefits from use of the environment are maximised relative to the aggregate environmental use permitted.

In principle, a similar result could be obtained by the introduction of suitable taxes or government charges on the use of the natural environment (Dales, 1968; Tisdell, 1993 a, Ch. 4).

However, it is not easy to predict the level of tax or user-charges necessary to achieve a particular degree of use of the environment or to achieve an environmental standard. Marketable rights or quotas are advantageous in that regard (Pearce and Turner, 1990; Tisdell, 1993 b). Secondly in order to meet the environmental targets set, taxes or charges need to be altered with changing conditions. Politically and administratively this is not easy. Consequently, they tend to be "sticky". On the other hand, the price of marketable pollution permits automatically changes as the demand for these alters. Nevertheless, marketable environmental-use rights have been subjected to substantial criticism as a means of environmental regulation (Livingston et al., 1996; Russell and Powell, 1996; Sterner, 1994).

2. Political Aspects

Politically it is easier in most cases to introduce marketable environmental-use rights than taxes or government charges on environmental use. This is so provided that 'grandfathering' is used to distribute rights. In this case the rights are distributed to those already involved in use of the environmental resource in question usually in proportion to their use at no charge or at a nominal charge. Consequently, any rents from rights to use the resource are captured by the existing users and there is little or no income transfer to the government. This reduces political opposition from environmental users such as producers. However, the question of whether such a distribution of property rights is just remains unresolved.

Rents from use of environmental resources in a system of marketable environmental-use rights need not be captured by the original users of the environment. Whether they are depends on how the system for such rights is designed and operated. If for example, rights are not in perpetuity but are auctioned say each year by the government then the government would capture the rents. However such a system is likely to be unpopular with existing environmental users. There are a variety of different possible schemes involving marketable rights to use the environment. They have different consequences for income distribution, economic efficiency and flexibility of policy and this aspect will be discussed below.

3. Marketability of Rights

If marketable pollution or environmental-use rights are to achieve the efficiency benefits

ascribed to them, then the market in such rights needs to be relatively competitive. In practice markets in these rights tend to be "thin" because there may be few holders of such rights particularly if rights are differentiated by region (see below).

Sale of rights can also be used to restrict competition and new entry. If rights are held by those already in an industry, they may retain them as a way of restricting new entrants. Supply in an industry could also be restricted by one or a few firms cornering environmental-use rights.

4. Enforcement and Agency Costs, Allocation of Rights

If a system of marketable environmental-use permits is to be effective, it is necessary to ensure that only those who have permits use the environment in question and do so only to the extent allowed by their permits. Failure to enforce the rules of the system can be expected to result in increasing violations and a breakdown of control. How does one ensure compliance?

One possibility is to allow permit-holders to sue violators for damages. This will however involve costs and legal uncertainty for any permit-holder bringing a court action against a violator and other permit-holders may free ride on the litigant. The system may therefore not result in sufficient enforcement to protect property rights through permits and to achieve environmental targets. Consequently, the government or an agency of the government may be called upon to enforce the regulations.

Considerable costs of enforcement may be incurred by the agency. It may for example have to keep a register of rights including transfers, and guard against the issue of fraudulent certificates. It will also need to monitor compliance and take legal action against violators. The question arises of who should pay for those costs and how. A common practice is to impose a levy on permit-holders and a fee on transfers to meet such costs. Thus the user appears to pay although the full incidence of these charges may not fall on permit-holders because they may be passed on to some extent to others further along the economic chain e.g., the buyers of the commodities of permit-holders.

Ideally the enforcement agency should minimise its costs for the degree of enforcement achieved. However, it may fail to do so. In fact, like many public agencies, it may try to maximise its budget, although possible criticism from permit-holders may curb its behaviour in

this respect. Nevertheless, its goal may be to maximise its budget subject to account being taken of the possible political pressures generated.

Another possible institutional means for obtaining compliance is co-management (Pomeroy, 1994). This approach involves the government agency and those involved in the use of the environment in co-operating to draw up and ensure enforcement of environmental regulations. This can have a number of advantages. It improves information flows between the parties involved and can reduce enforcement costs (Kuperan and Sutinen, 1996). On the other hand, there are circumstances in which it would give rise to socially unacceptable results. This may occur when all relevant interest groups are not involved in the management of environmental use. For instance if co-management only involves members of the public service and permit-holders, those damaged by pollution are unrepresented. At least this is so if only permit-holders are polluters.

Note that it is sometimes considered to be an advantage of a system of tradeable pollution or environmental use-permits, that those who wish to prevent the activity can buy permits and withhold these from the market and from use. This action will be effective provided that it is not counteracted by an increased issue of permits by the government. The latter is always a political possibility. Secondly, benefits from environmental conservation are often greatly diffused and can be relatively small for each individual. No or few conservationists might find it worthwhile to buy environmental-use permits for withholding purposes, even though collectively it may be worthwhile for them to do so. Because of free riding and the cost of organising collective action to buy environmental-use permits for withholding purposes, it is unlikely to occur. Thus the system is not fully effective in achieving conservation goals.

The buy-back proposed for conservationists also raises the question of justice. Should environmental-user rights be given to conservationists in which case those wishing to use the environment would need to purchase rights from conservationists or should those permits be allocated to users of the environment, or should the initial allocation involve an allocation to both parties. Despite the suggestion of Coase (1960), environmental use is likely to vary with the initial allocation of rights to use of the environment (Tisdell, 1991, p. 136). In addition, the nature of this allocation affects the distribution of incomes in very different ways.

5. Locational Factors and Environmental Rights

The sustainable level of environmental use or the socially optimal level of environmental use can vary from region to region. Thus different levels of environmental control may have to be executed in different regions and this calls for variation and differentiation in environmental-use rights by location (Tietenberg, 1974). Furthermore, this can be expected to result in variations in the market price of pollution rights between regions. Thus regional diffentiation in pollution rights in Southern California results in permits for air pollution rights having a higher price in coastal areas than inland. Because the prevailing winds blow from the sea more damage is done by air pollutants originating near the coast in Southern California than by those emitted further inland. Similarly, it is possible that water pollutants originating upstream may do more environmental damage than those released near the mouth of a river.

While regional differences in rights to use the environment are often necessary, one problem in the case of marketable permits is that this reduces the breadth of markets for rights because it creates regional submarkets. This can affect market competition for such rights and make it easier to corner rights in some regions. Ownership of rights can be used as a barrier to entry of new regional competitors or in certain cases as a means to restrict regional supplies.

In some cases, regional rights to use the environment need to be varied seasonally e.g., depending on the seasonal direction of prevailing wind flows or water currents. In principle, environmental-use rights can be designed to take seasonal variation into account.

6. Duration of Environmental - Use Rights and their Nature

Transferable environmental-use rights can vary significantly in their direction and in their nature. The following are some of the possibilities:

(i) The permit-holder has the right in perpetuity to use the environment to a fixed absolute extent e.g., the right to a specified absolute catch of a fish species annually, rights to emit a particular quantity of pollutants per year.

(ii) Rights may be as above but for a finite period e.g., for one year or for five years.

(iii) The rights may be in perpetuity but only for a fixed *proportionate* level of use of the environment, e.g., rights to emit a fixed proportion of the total or aggregate level of emissions of a pollutant allowed in each period of time for instance a year, rights to a fixed proportion of the total allowable catch of a species. This method is used for example to allocate rights to catch southern bluefin tuna in Australian waters.

(iv) Another possibility is for the above rights not to be in perpetuity but for finite duration.

(v) Still another possibility is for the above absolute or relative rights to be discounted or diminished in a regular fashion with the passage of time. For example, 10 percent of rights per year may have to be surrendered to the government. The government could re-issue these or it may decide not to do so or only re-issue a portion of the surrendered rights. A system of this type was proposed at one time for permits for amateur fishermen in New South Wales.

(vi) In some cases, rights may be restricted in terms of their transferability e.g., they may be restricted to use in a particular region or regions.

(vii) The method by which permits are issued or re-issued can vary. For instance, their issue could be by open tender or auctioning with a variety of conditions applying or they may be allocated administratively taking into account pre-existing use of the environment by the parties concerned.

From the above, it should be clear that a large range and complex set of possibilities exist for systems of transferable or tradeable environmental-use permits. Differences in these systems are liable to have different implications for economic efficiency and for the impact generally of environmental regulation. Take case (i) above, absolute rights in perpetuity. This provides considerable security to permit-holders but provides the regulator with virtually no flexibility. This can create difficulties. For example, suppose that after the absolute rights are issued it becomes clear that the aggregate level of environmental-use allocated is unsustainable or not optimal and needs to be reduced. Given the nature of the rights, this can only be achieved by

the government buying back rights which can be expensive. This is not just a hypothetical possibility. The New Zealand Government in a bold experiment introduced such a system for some of its fisheries. Subsequently, it was found that the total allowable catch for some species exceeded the level that was sustainable. The Government therefore, at considerable expense to New Zealand taxpayers, purchased back some of the rights and did not re-issue these.

Schemes of shorter duration or in which rights 'depreciate' or are discounted with the passage of time provide environmental regulators with more flexibility but create greater uncertainty for users of the environment. In practice a compromise between security of rights for environmental users and the need for some flexibility in regulation needs to be reached. Systems of marketable permits should be designed with this in mind. In doing this, it is important to bear in mind that businesses may have to make long-term investments to curtail pollution efficiently or limit their use of the environment. The greater the degree of uncertainty about allowable future environmental use, the less likely businesses are to commit themselves to investments reducing environmental degradation because they need to retain flexibility as a hedge against uncertainty.

7. Ambience

In many cases, the impact of use of the environment depends upon ambient conditions. Since these can often vary considerably, ideally permitted use of the environment should be altered as their conditions change. However, the transaction costs of such variations can be high and they may be so high that it is not worthwhile trying to achieve the absolute ideal.

Where it is not practical to vary user rights as ambient conditions alter, the level of use allowed by the permits may have to be adjusted to take this into account. Thus, if for example, there is expected to be a period of the year when ambient conditions are expected to be such that air pollutants cause much greater environmental damage than usual, rights to emit air pollutants may be curtailed more than otherwise for the whole period in which the rights apply. This is the most likely approach when the period of environmentally dangerous ambient conditions is uncertain and variable.

If this period is relatively certain, for example, occurs in the summer season only, then the rights to use the environment can be specified in a regularly varying manner. For example, users of the environment may be issued with permits to emit a specified quantity of air pollutants per month but the quantity allowed in the summer period may be 20 percent less than in the remainder of the year. Other possibilities also exist e.g., the 20 percent reduction applies only when this is announced in advance by the regulator.

8. Concluding Comment

Some writers extol the virtues of marketable environmental-use rights in comparison to other means to control the use of the environment. Their argument is usually based on highly simplified models and situations. In particular, they give insufficient consideration to the complexities of systems of marketable rights to use the environment and the possible diversity of such systems. There is a need to give much more attention to the varied possibilities for such permit systems and the consequences of different types of these systems. Otherwise, little practical progress will be made in devising effective and efficient policies for environmental management.

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