

# Intervention of governments and means of pollution control

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## Introduction

Economists consider environmental pollution as an economic problem and it is the result of a market failure. This term is used broadly to cover both situations where a market, and hence a market price, does not exist and where the price is a defective index of value. In the context of environmental economics the most important source of market failure is the divergence between the producer's evaluation of the costs of his activities and the evaluation by society as a whole. This divergence typically arises because of the presence of what are called "external effects" and "third-party effects".

With regard to private markets, they can provide inadequate environmental protection when environmental values are externalities inadequately reflected in the prices consumers pay for goods and services or, when environmental values are public goods, all individuals benefit but no single individual has an adequate incentive to invest.

In order to correct the market failure economists would require private decision makers to internalise the externalities through governmental intervention. The efficiency argument for public intervention to reduce pollution or ameliorate its damage is well established in theoretical literature. Pollution is an example of a negative external effect and it imposes harmful effects and costs on people other than the polluters. The free market does not motivate the polluters to reduce damage since the costs are largely paid by others. The market, if it is left to itself, is consequently not the most effective mechanism for keeping pollution at reasonable levels.

## Instruments of control

The leading instruments of control to be considered are:

- 1) regulations;
- 2) subsidies;
- 3) taxation.

Regulations, in the sense of "command and control" by

*L'argomento di questa nota è l'adozione di strumenti correttivi da parte del settore pubblico dovuta al fatto che i costi ambientali imposti a terzi non sono pagati da chi di fatto li genera. Il prezzo che viene pagato dall'utente del servizio di trasporto non riflette il costo sociale, di qui l'intervento del settore pubblico avente come obiettivo la correzione o l'eliminazione delle esternalità provenienti dal settore dei trasporti. La soluzione alle esternalità suggerita da Pigou prevede l'imposizione di un'imposta al soggetto inquinante al fine di imputare correttamente i costi considerati come espressione dei prezzi d'uso delle risorse naturali. Il principio "inquinatore-pagatore" dovrebbe dunque essere applicato al settore dei trasporti al fine di ristabilire l'efficienza economica attraverso l'internalizzazione dei costi ambientali.*

governments, rely on uniform, inflexible, technology-based standards coupled with monitoring and sanctions. In this case the polluter has an incentive to comply with regulations otherwise sanctions are imposed for non-compliance. This type of regulatory system has been severely criticised by many experts for being cost-ineffective, inflexible and for discouraging innovation and investment.

Another form of governmental intervention is represented by subsidies. They are widespread in transport and are often justified as an instrument by which to encourage the use of more environmentally friendly public transport modes.

As for taxation, this is another indirect tool that can be used to reduce pollution. If a polluter's emissions can be fully determined by the con-

sumption of one good then the good, according to marginal external costs, is equivalent to an emission tax. Indirect pollution taxes applied to fuels, such as carbon taxes, are an example. In fact the external effects are independent of both source location and combustion process. But if a pollution good cannot be fully taxed then a related good should be taxed if it is a complement to the polluting good and subsidised if it is a substitute good. For example if we suppose that private vehicle use in urban areas is polluting but it cannot be taxed sufficiently, or only at a prohibitive cost, then a "clean" substitute, such as a subway, should be subsidised but a "clean" complement, such as central parking facilities, should be taxed.

Nevertheless taxation of complements and subsidisation of substitutes are efficient under fairly general assumptions, but counterintuitive results can take place because they depend on own-price and cross-price elasticities of demand. These happen when indirect instruments have involuntary distortions. In the example mentioned above if public transport and central parking facilities are sufficiently strong substitutes for each other, subsidising subways and taxing parking spaces can have the