

E

THE ECONOMICS OF EXTERNALITIES

INTRODUCTION

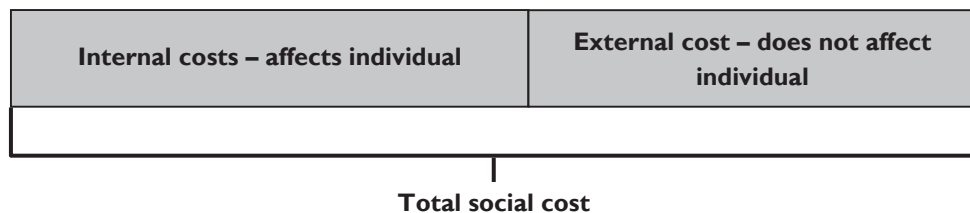
E.1 Poor health imposes costs on individuals and society. These costs include, inter alia:

- the resources required to cure or prevent poor health;
- lost production whilst the individual is incapacitated, or after he or she has died;
- the discomfort from pain and poor quality of life; and
- anti-social costs e.g. cost of related crime.

ECONOMIC TYPES OF COST

E.2 All these costs impact on society. Some affect the individual concerned; others do not. This distinction provides the division between internal and external costs. The total cost to society is the sum of both the internal and external costs (see chart E1).

Chart E1 Internal and external costs



DECISION-MAKING AND COSTS

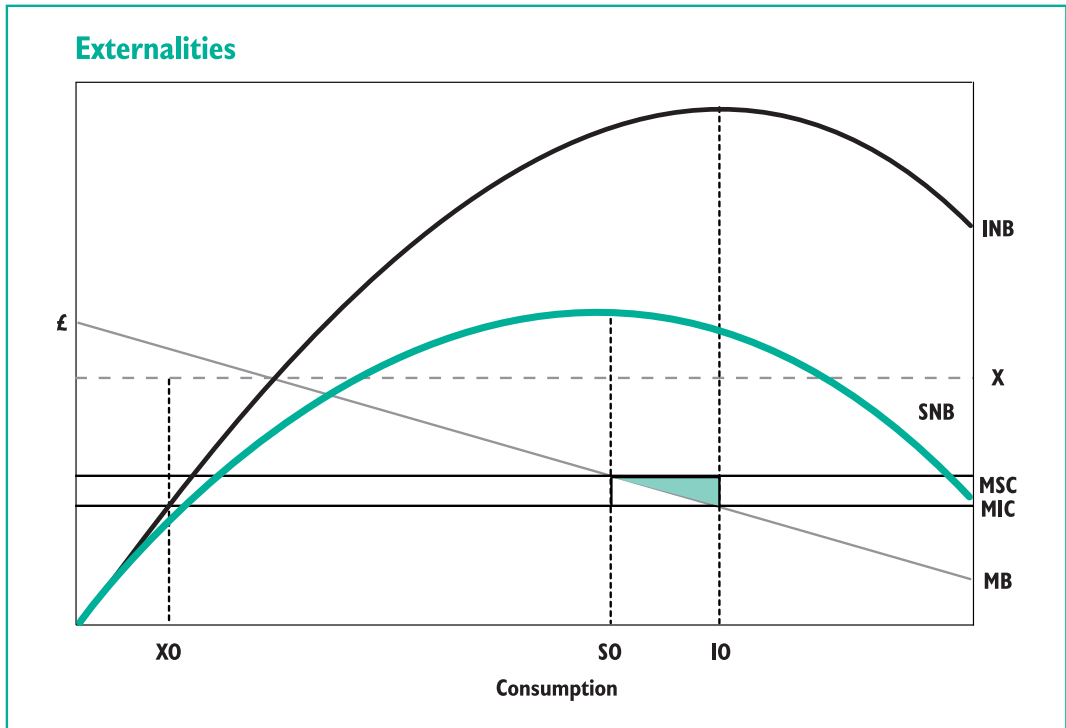
E.3 It is assumed that individuals are rational and base their decisions on the desire to maximise their utility. For a single good, this would mean that they will increase the consumption until the benefit derived from consuming an addition amount, the marginal benefit, is less than the extra cost, the marginal cost. For instance, an individual would consume more of an alcoholic drink until the benefit derived from an extra unit would be less than the cost of a unit.

E.4 This decision is represented in chart E2, where the optimal consumption for an individual is the point IO, where the marginal benefit line (MB) intersects the marginal individual cost (MIC). At this point, the individual's net benefit (INB) is the highest.

E.5 However, in this example, from society's perspective, the individual is over-consuming the good, as he or she is not bearing the external costs. If the full marginal social cost – i.e. both internal and external costs – is considered, the individual would stop consumption when the marginal benefit is less than the full marginal social cost. So, taking the example of alcohol, the individual would stop drinking once the benefit of an extra pint is less than the cost of the pint to him and society (for example, from health costs).

E.6 In figure E2 the socially optimal point is shown as SO, where the marginal benefit line intersects the marginal social cost (MSC). The external cost is the additional cost of the MSC above the MIC line. At this level of consumption, the individual's net benefit is not at its maximum level, but society's net benefit (SNB) is.

Chart E2 Representation of an individual's choice of the level of consumption of a good.



CORRECTIVE TAXATION

E.7 What the economic analysis above describes is the problem caused by external costs. An individual rationally seeking to maximise their own utility will consume up to IO. However, from society's perspective, this is over-consumption, and they should be consuming up to SO. The loss of social welfare is shown as the shaded area.

E.8 The economically efficient response to such a situation is to internalise the externality, i.e. cause the individual to bear the external cost, through levying a tax set at the marginal external cost. By levying the tax, the cost to the individual will equal the social cost of the good. At the new higher cost, it is rational for the individual to reduce consumption to the socially optimal level.

E.9 It should be noted that to influence an individual's behaviour, the tax should be set at the level of external costs, not the total social cost. As they already bear their own internal costs, these do not need to be included in the tax. If the tax is based on the social cost of a good, the good's price will rise so much that an individual will under-consume.

E.10 In figure E2, if the tax were set at the social cost of the good, its total cost would rise to line X, reducing consumption to XO¹. This level of consumption is neither optimal for the individual or society.

E.11 Applying this analysis to, for instance, alcohol consumption by levying a tax on alcohol set at the marginal external cost (for example, to include the costs of health services, anti-social behaviour and possibly increased absenteeism), consumption of alcohol would fall to a socially optimal level. However, if the tax included costs that are already borne by the individual (for example, cost of lost wages due to unemployment or death), the cost of alcohol would be raised to a level such that consumption would fall below the socially optimal level.

PUBLIC SERVICE PROVISION AND COST-BENEFIT ANALYSIS

E.12 When the Government is providing a public good or service, it is typical to conduct a cost-benefit analysis to determine whether the cost of providing a service is less than the associated benefits. In these cases, it is appropriate to consider the total social cost (or benefit) of an intervention, i.e. both internal and external costs.

E.13 For instance, the value of a treatment to stop excessive drinking would be based on the reduction in both the future external (for example, health care costs) and internal (e.g. lost economic production) costs. If this value outweighs the treatment's cost, it would be worthwhile to provide. In this case, it is appropriate to include all the saved future costs of poor health, not just externalities, as the public service is to be provided free at the point of delivery. As there is no economic transaction between the individual and the service provider, there is no opportunity for these saved future costs to be considered by the individual. Therefore, the Government's analysis must include both the saved internal and external costs.

E.14 If the individual is charged for the use of any services, it is economically efficient for the Government to offer subsidies equal to the marginal external benefits (for example, saved health costs), but not marginal internal benefits (for example, increased economic production). The reasoning is the same as discussed above. The individual will consider the benefits to himself of any service during the purchase. To include these benefits in the subsidy would decrease the cost of a service to a degree that there will be over-consumption.

¹ In the figure, the line X represents the situation when a tax is set at the total social cost of a good, i.e. the internal and external cost. This includes the cost of the actual good itself. To include the cost of the good in the tax is obviously absurd, but any internal costs included in the tax will increase the price of a good to a level above the social cost line (MSC), by definition, and hence cause under-consumption. As long as it can be assumed that individuals are rational and informed about the full cost to themselves of consuming a good, there is no need to include the internal costs in a tax as individuals will already include them in their decisions. Of course, it can be argued that individuals can be neither fully rational nor informed, but these market failures can ideally be tackled more efficiently by other measures (e.g. education).

SUMMARY

E.15 All costs are costs on society. Some costs affect the individual making a decision – internal costs – whilst others affect others without affecting the individual – external costs.

E.16 In a free market, a rational, fully informed individual seeking to maximise their utility, will consume a good until the benefit of consuming an extra unit of the good is less than the extra cost to themselves.

E.17 From a society's perspective, because the individual does not bear the external costs, he or she will over-consume the good. Social welfare would be increased if the individual reduces consumption.

E.18 To correct this failure, a tax can be levied on the individual at a rate equal to the marginal external cost of consumption.

E.19 As the individual already considers the internal costs when deciding their level of consumption, including any internal costs will lead to under-consumption of a good, where both the welfare of the individual and society is not maximised.

E.20 However, when the Government is valuing the provision of a public service, which is free at the point of delivery, it is appropriate that internal costs and benefits be included in any analysis, as the individual has no opportunity to consider these as no economic transaction exists between them and the service provider.