

Economic Valuation and Environmental Decision-Making in Europe[†]

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This paper looks at the way economic valuation has been integrated into decision-making at (i) the pan-European level, using the European Commission as an example, and (ii) the national level within Europe, using the United Kingdom as an example. The focus is on the use of economic valuation for policy-making purposes. A definition of economic valuation is provided, with an overview of its potential uses in decision-making. This is followed by a summary of the various valuation techniques available, and how they are related. Legal developments in Europe and the U.K. affecting economic valuation are reviewed, as is the execution of formal appraisals for policy-making purposes. A retrospective look at the emergence of economic valuation shows that while great advances have been made at the European and U.K. national levels through introducing environmental appraisals in recent years, in the past policy has not always been informed by systematic appraisal techniques. Today, economic valuation is enjoying a revival and is probably more widely used than is realized. However, ideological and practical obstacles still inhibit its wider use, and its implementation lags significantly behind, for example, the United States.

Introduction

In environmental policy, economic valuation involves the assignment of money values to changes in environmental services and functions and to stocks of environmental assets. These money values are, effectively, prices. Where environmental assets are marketed, e.g., with crude oil or natural gas, the notion of valuing stocks and flows in terms of money values is widely understood and accepted. More controversially, the notion of assigning a price can be extended to assets and services that have either no obvious market or no market at all. Peace and quiet is not obviously bought and sold in the market place. But closer inspection shows that there are indirect or “surrogate” markets in peace and quiet. The housing market balances the supply and demand for housing, and the demand for housing is in turn a demand for a bundle of “attributes” possessed by housing. Those attributes include the size and location of the house and also its environmental context. The price of houses is therefore influenced by the supply and demand for peace and quiet.

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In this way, the “price” of peace and quiet can be inferred from housing market behavior.

In other cases, there is no market at all. The ecological regulation functions of a forest are not bought and sold, nor is there any evident market, although a few cases exist where forest owners are paid to conserve forests because of the effects on adjacent land uses if the forests are converted. The clearest example of going from a no-market to market situation is the emergence of a market in reducing carbon dioxide emissions or “fixing” atmospheric carbon in biomass. Whereas 10 years ago there were no examples of such markets, today there are over 200 acknowledged “trades” in buying and selling the reduction of greenhouse gases such as carbon.

These examples illustrate the notion of valuing environmental services and assets in money terms. This paper looks at the way this idea has been integrated into decision-making at (i) the pan-European level, using the European Commission as the example, and (ii) the national level within Europe, using the United Kingdom as example. We find that there are now legal mandates for the use of monetary valuation, that its use is expanding rapidly, but that ideological and practical obstacles still inhibit its wider use.

Uses of Economic Valuation

Potential uses of economic valuation include:

(i) Cost–Benefit Analysis (CBA) of Projects. This is the traditional role of valuation, reflecting the underlying way in which the theory itself developed from its very earliest beginnings in appraising public projects (1, 2) that had no market. It remains the context in which it is most used today.

(ii) CBA of Policies. Economic valuation of policies is well-established in the United States where, since 1981, legislation has demanded that all new major regulations be subjected to CBA. Progress in Europe has been less rapid: it is only since the beginning of the 1990s that European Commission Directives have been subject to economic appraisal. However, changes in legislation mandating some form of environmental appraisal for new policies suggest that its use may continue to increase.

(iii) Pricing Policy. In the design of pricing policies, for example, for access to and maintenance of natural resources such as a national park, valuation may be used to elicit the demand curve for the resource and to predict the effects of pricing on behavior. The connection arises because valuation involves seeking the consumer’s willingness to pay (WTP) for the asset, something that environmental economics has in common with fairly conventional market research. Certain techniques also enable an estimation of the value of different attributes of the resource in question, enabling resources to be directed most efficiently to maintaining those particular assets.

(iv) Design of Environmental Taxes. Europe is seeing a slowly increasing use of environmental taxation (ecotaxes) whereby polluters are charged directly for emitting pollutants. Invariably those taxes are calculated on the basis of political and other factors unrelated to their optimal design from an economic point of view. But there is now an increasing trend toward designing taxes so that they reflect the monetary value of the extra damage done by one extra unit of pollution. This represents an adherence to a general rule for tax design derived from the theory of environmental economics.

(v) National Accounting. There is a growing interest in modifying the “national accounts”, the set of accounts that comprise a nation’s gross national product (GNP). GNP measures the total flow of goods and services in the economy. Some of this economic activity is taken up with replacing

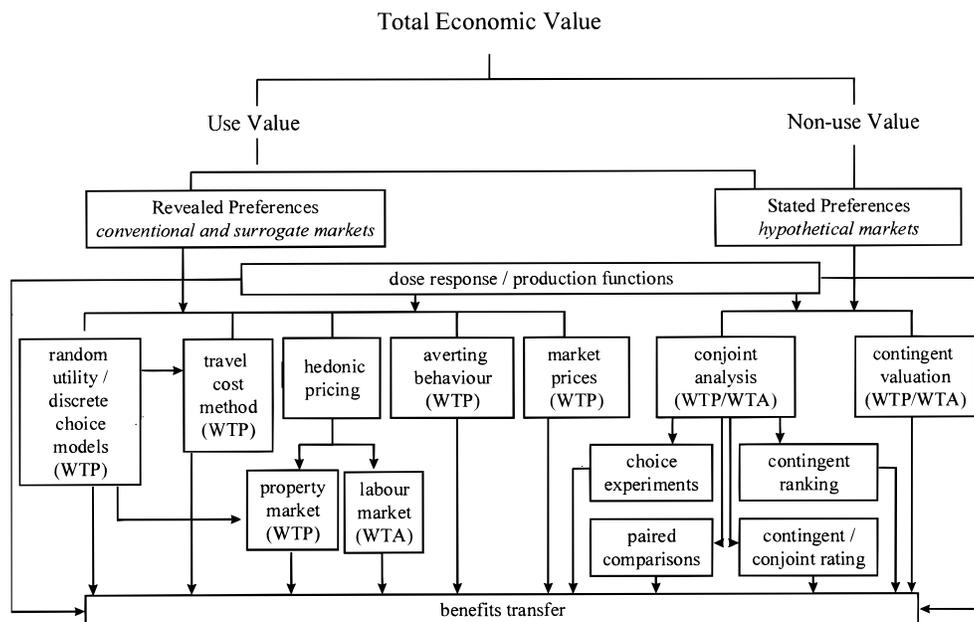


FIGURE 1. Techniques for economic valuation.

depreciation of assets such as machinery and roads. Hence only the “net” national product strictly contributes to average well-being. By the same token, such net measures do not include any depreciation on environmental assets such as forests, rivers, coastal zones, etc. Further deducting the monetary value of the damage to these assets from the net national product would give a better measure of the “true” level of economic activity. Such “green accounting” is now quite widespread.

(vi) As a Management Tool. Less well understood is the role that monetary valuation can play in asset management. Effectively, valuation indicates the relative strength of WTP for different features of a given asset. Hence, the asset can be managed so as to highlight and expand those features that attract the highest WTP. It seems fair to say that there is little experience with this use of valuation, but it is likely to grow as techniques increasingly isolate the monetary values of individual attributes of assets.

(vii) As a Participatory Exercise. “Stated preference techniques” used in valuation (see the next section) involve a direct questionnaire approach that allows people to express preferences for or against environmental changes. In addition to the derivation of monetary values for the proposed changes, public participation can help to ensure that the final change is acceptable to those who are likely to be most affected by it. Valuation also indicates gains and losses to different stakeholders, so that the potential for trades between gainers and losers can be identified.

To date, the main uses of economic valuation in Europe have been for CBA, “green” national income analysis, and environmental tax design. Practical experience with economic valuation as an input to policy design is explored below.

What is Economic Valuation?

The economic approach to valuing environmental changes is based on people’s preferences for changes in the state of their environment. Environmental gains and losses are defined in terms of increments or decrements of human well-being (welfare or utility). These, in turn, are measured by individuals’ WTP for a gain or WTP to avoid a loss, or individuals’ willingness to accept (WTA) compensation to tolerate a loss or forego a benefit. If these quantities can be measured, then economic valuation allows environmental

impacts to be compared on the same basis as financial costs and benefits of any project or policy.

However, the lack of markets for environmental services means that, unlike man-made products, they are not explicitly priced, so that their monetary values to people cannot be readily observed. The practical problem with economic valuation, therefore, is one of deriving credible estimates of people’s values in contexts where there are either no apparent markets or very imperfect markets (so-called “missing” or “incomplete” markets). Preferences can be measured or valued in several different ways. [For a general reference for the nontechnical reader, see Pearce (3).]

Figure 1 shows the various techniques for monetary valuation and how they are related. Detailed guidance can be found in various texts (4–9). Hanley and Spash (7) is particularly useful for its U.K. case studies.

The “total economic value” of an environmental good is made up of “use values”, for example, recreational use of a resource, and “nonuse values”, which reflect the fact that individuals may value resources for reasons unrelated to their use. The two basic approaches to valuation involve “stated” preferences—i.e., preferences conveyed by a respondent to a question—and “revealed” preferences—i.e., preferences inferred from the behavior of an individual in making choices about some good or option not explicitly connected to the attribute being valued. Contingent valuation and conjoint analysis are stated preference techniques, and these are the only methods capable of estimating nonuse values. All others are revealed preference techniques. Many cost–benefit references list dose–response functions (or production functions) as separate valuation procedures. Production functions relate some dose or input (e.g., pollution) to some effect (e.g., morbidity). In a different sense, households might be thought of as having production functions in that they combine various goods and service together, including environmental services, to produce a level of well-being. As far as the dose–response interpretation is concerned, valuation is applied to the outcome (output, impact, response) of the production function. Production functions therefore tend to be an integral part of several valuation procedures. Benefits transfer, a procedure that “borrows” the monetary values from completed valuation studies for use in another context, can then be applied to any of the original valuation

techniques. [Although the application of benefits transfer is fraught with difficulties: see the final section of this paper.]

The application of economic valuation techniques to environmental changes is by no means uncontroversial. There are several reasons for this, many of which stem from a misunderstanding of monetisation. The use of money as a standard is sometimes a barrier to wider acceptance. Many people believe that some environmental assets are “priceless” in the sense that they cannot accept tradeoffs involving these assets, or they consider it immoral to place a value on goods, such as clean air or water, which are generally seen as a right for all. However, monetization is simply a convenient means of expressing the relative values that society places on different uses of resources. Valuation is a means of measuring public preferences for environmental resources and is not a valuation of those resources in themselves (so-called intrinsic values).

Another concern is that individuals’ preferences, expressed in terms of their WTP, reflect only self-interest, while social decisions should be made out of concern for the public interest. However, in reality, preferences may have all kinds of motives, including a concern for others, for future generations, for different species, etc. This has been consistently shown in existing valuation studies that have investigated the motives behind stated WTP. Other objections to monetization, which are based on practical experience with the techniques, are surveyed in the final section of this paper.

Policy Appraisal in the European Union

It seems fair to say that, until recently, environmental policy at the European Union (EU) level has not been informed by environmental appraisal procedures, where appraisal is taken to mean a formal assessment of policy costs and effectiveness using any established technique including economic valuation. However, that picture has changed in recent years, and the use of economic valuation is now accelerating as procedures for assessing costs and benefits are introduced in the light of changes to the Treaty of Union. While much more economic valuation is being carried out, the extent to which the studies are influencing policy remains unclear.

The Treaty of Rome establishing the European Community made no reference to the environment. Despite this, the Community introduced environmental legislation from the early 1970s, and five “Environmental Action Plans” (EAPs) have been implemented from 1973 to the present day. The 1992 Fifth Environmental Action Plan, *Toward Sustainability (10)*, made explicit reference to economic valuation:

“Valuation, pricing and accounting mechanisms have a pivotal role to play in the achievement of sustainable development. Economic valuations can help economic agents to take environmental impacts into account.” while measures needed include the “...development of meaningful cost/benefit analysis methodologies and guidelines in respect of policy measures and actions which impinge on the environment and the natural resource stock. (European Commission 1992)”.

Article 130r(3) of the Treaty of European Union (the Maastricht Treaty) requires action to take account of several factors of which one is “the potential benefits and costs of action or lack of action”. Clearly, *some* form of formal appraisal is mandated by this provision. The issue in question then is how the Commission has taken this requirement into account in formulating its own Directives, and how much of a role economic valuation has played.

Until recently, economic valuation has been used only in the most loose manner. Case studies suggest that, until the early 1990s, EU Directives were very rarely subjected to formal environmental appraisal. Pearce (11) in an investigation of EU policy on waste, biodiversity, and water highlights the

TABLE 1. Formal Appraisals of Environmental Issues or Directives in the EU^a

issue	year	no. of studies
biodiversity	1987–1997	none
common agricultural policy	1996–1997	2
internal market	1988–1989	15
	1992	1
benefits assessment (general)	1989–1990	2
economic instruments	1988	1
	1990, 1992–1993	4
carbon energy tax	1992–1995	9
air pollution	1987	2
	1991	1
	1994–1995	3
	1996–1997	2
fifth EAP	1994	3
EIA	1995	1
noise	1996	1
water pollution	1988	1
	1989	9
	1992–1996	17
solid waste	1990	1
	1992	2
	1994–1996	8
priority setting	1996	1

^a Source: Pearce (11).

lack of rigorous analysis in every case, even where economic valuation studies did already exist. As a result, environmental policies have sometimes been shown to be undesirable in ex post cost–benefit terms, often imposing significant implementation costs greatly in excess of any benefits. This appears to be the case, for example, with the Drinking Water Directive (which specifies maximum contaminant levels in drinking water) and the Bathing Waters Directive (which specifies standards for coastal waters used for bathing). While the use of economic valuation or other formal appraisal methods would not necessarily have resolved many of the problems, it is likely that their use would have highlighted some problems at an earlier stage of policy design. Examples include the undesirability of the very high levels of waste recycling targeted in European waste directives and the “excessive” standards for cleanliness of drinking water and bathing water. Given the extent of legislation over the past few decades, the neglect of environmental appraisal must have imposed significant costs on Member States. Exactly what those costs are is difficult to determine without detailed retrospective analysis. However, the case studies suggest they are likely to be substantial.

Table 1 gives some indication of the execution of formal appraisals for EU policy-making by year where formal appraisal has been taken to mean cost–benefit or cost–effectiveness analysis—i.e., any study must offer some analysis of the benefits of compliance, however crude. [The table is based on a library search at the European Commission. Most titles and keywords indicate clearly the content of the studies, so that the results are likely to be fairly accurate. However, given the number of document titles supplied, it has not been possible to check the content of those where the title is ambiguous.] Monetary valuation is by no means included in all or even most of these studies, so this summary should be seen as an “upper bound” on its role in affecting actual policy decisions.

Table 1 suggests some important results. First, some sort of formal appraisal was undertaken on water pollution and on the impacts of the Single Market before 1990. The number of studies indicated is deceptive, however, since they are often studies repeated for several countries or, in the case of water pollution, for different substances. Nonetheless, the

fact that impacts were measured for individual Member States is an indicator of the importance of the issue. The multiplicity of studies on water tends to reflect the significant number of key pollutants involved in water pollution. The other major targeted area for simulations of costs and benefits was the carbon energy tax. In turn, this proposed Directive attracted probably the single largest opposing lobby of any Commission proposal, so that the studies are a natural outcome, anticipated or ex post, of that process. Studies of Directives per se remain very few, and these tend to be concentrated in the period since 1994.

However, since the early 1990s, formal appraisal procedures encompassing economic valuation have improved and have been applied more widely. Cost–benefit or cost–effectiveness appraisals have been carried out for potential new measures on water quality, municipal waste disposal via landfill and incineration, plastics recycling, paper recycling, the CO₂/energy tax, acidification strategies and emission limits on conventional air pollutants, and the effects of civil liability systems. As an example, economic valuation has been applied in the appraisal of the planned EU Acidification Strategy (12) and suggests health benefits significantly greater than the likely control costs. Finally, in recent years, municipal waste disposal and incineration particularly have been subjected to a number of different appraisals (13–18).

Project-based valuation studies are excluded from Table 1. However, environmental appraisal techniques have recently achieved a higher profile in project evaluation carried out by the European Investment Bank (EIB). The EIB recently commissioned a set of guidelines (19) for appraisal of the external benefits and costs of investments in the solid waste, water supply, and treatment sectors. The emphasis of the guidelines is on the use of monetary valuation techniques wherever possible. Similarly, environmental appraisal is used in the assessment of transport and energy projects. While appraisal is not a formal requirement, the guidelines are intended for use when a project is considered to be “borderline”—i.e., financially viable but potentially environmentally damaging or, conversely, financially questionable but potentially beneficial to the environment. Progress with economic valuation has not been made to the same extent by the European Bank for Reconstruction and Development (EBRD). Representatives expressed scepticism about using the techniques and concern about the potential controversy of results. [Based on personal interviews with EBRD staff. It is noteworthy that EBRD appears not to employ any environmental economists.] Environmental valuation in monetary terms was something that was seen as having an important role in the future. However, the current position is to wait and see whether other international financial institutions embrace the topic. The European Environment Agency (EEA), which is responsible for data collection and policy review within the EU, has similarly been circumspect about embracing valuation. Nonetheless, its current (1999) State of the Environment Report (20) includes monetized estimates of damage to highlight the economic importance of environmental damage.

Overall, monetary valuation has taken off within European legislative agencies in the last 8 years or so. Most agencies—the European Commission, the EIB, and, to some extent, the European Environment Agency—have accepted monetary valuation to a greater or lesser extent. Motivations appear to include a focus on “value for money”, which was the very source of CBA in the United States in the 1950s, and the demand from Member States that the Commission should reduce legislative activity that was imposing massive compliance costs on Member States. Given the imminent expansion of the EU to include a growing number of Accession States, this pressure for cost–effectiveness will

grow rather than diminish. We therefore anticipate a greater future role for monetary valuation.

Policy Appraisal in the U.K.

The use of economic valuation techniques in policy-making at the national level has been similarly recent. In the U.K., renewed emphasis on efficiency in public expenditure furthered interest in CBA at a domestic level, while concerns about the costs of EU regulations were arguably instrumental in the U.K. efforts to include Article 130r in the Single European Act.

Strictly interpreted, environmental appraisal (i.e., formal assessment of policy costs and effectiveness using any established technique, including economic valuation) is formally required in policy-making in the U.K. In practice, the experience has been patchy, and no uniform system of appraisal has been pursued. In some cases, outright hostility to using appraisal techniques based on monetary valuation remains. In 1991, the Department of the Environment published guidance on environmental appraisal techniques (21) for policy and project evaluation. The guidelines were aimed at policy-makers across central government departments, for appraisal of environmental policies as well as policies that do *not* have as their main aim enhancement of the environment but nonetheless have environmental impacts. The guidelines include monetary valuation along with risk assessment and multicriteria analysis. Although unstated, there was a presumption that monetization and CBA were favored. This is consistent with guidance from the U.K. Treasury, which had long published a “Green Book” for guiding government departments in their appraisal work. The latest issue (22) is couched mainly in terms of monetized costs and benefits, although explicit attention is paid to situations where monetization is thought not to be possible.

However, a follow-up study (23) to determine how far the guidelines were being implemented concluded that there was a long way to go before environmental appraisal techniques were adopted across government departments. For overtly environmental policy though, economic valuation plays a much greater role. Table 2 lists some major environmental policy decision areas and the input of economic valuation studies. Only studies that were directly requisitioned for policy advice or that are cited by government sources as informing decision-making are included.

In some areas, therefore, monetary benefit estimation has been extremely influential in determining policy. Some agencies such as the Health and Safety Executive (HSE) and the Forestry Commission routinely use economic valuation in the setting of risk standards (HSE) and in the assessment of nontimber benefits of afforestation (Forestry Commission).

Monetary benefits and damage studies are also being used to inform decisions about and the design of possible market-based instruments in other sectors. This is notable in the case of waste: the initial setting of the U.K. landfill tax was based on monetary estimates of environmental costs, and a further study on disamenity costs has recently been commissioned for revision of the tax (34). There are also a few examples of studies in progress or just completed that have been commissioned to inform policy debate and are likely to influence policy decisions. In agriculture, a contingent ranking study measuring people’s WTP to avoid the environmental and health effects of pesticides (51) has been used in the design of a pesticides tax (32) that is currently under consideration by the DETR.

A tax expected to be introduced in 2000 or 2001 concerns the extraction of aggregates materials (sand, gravel, etc.). Early introduction of the tax was delayed because of difficulties in estimating the monetary value of the environmental damage done by aggregates extraction, a clear indication of the importance attached to the economic

TABLE 2. Economic Valuation Studies in Support of U.K. Environmental Policy

air	studies used to inform the national air quality strategy (1997) but not to set objectives (see 24): sulfur dioxide—benefits estimation (25); ozone—health, crops, and materials benefits (26); particulate matter—health benefits (27) and all benefits (28)
agriculture	pesticides: costs and benefits to farmers from policies aimed to reduce pesticides risks (29); wider costs and benefits of pesticide reduction (30); risks and benefits of reducing agrochemicals (31); consultation paper for design of a pesticides tax (30, 32)
solid waste and minerals	landfill tax: environmental costs and benefits of landfill tax (33); fixed external costs of landfill (34) incineration: assessment of the costs and benefits of the proposed waste incineration directive (35) aggregates: environmental damages from aggregates extraction (36–38) dredging: costs and benefits of alternative uses of dredged harbor material (39)
energy pricing	electricity: monetary value of externalities from electricity (40) renewable energy: monetary values of externalities from renewable energy systems (41)
chemicals	control of various substances: HSE has carried out numerous CBAs for various substances, mainly relating to occupation exposure, including propylene oxide, PCBs, platinum soluble salts, O-toluidine, iodomethane, cotton dust, softwood dust, azodicarbonamide, antimony, triglycidylisocyanurate (TGIC), and wool process dust
water	EC Bathing Water Directive: evaluation of benefits of compliance (42, 43) guidelines on unit values for benefits estimation (44–47)
forestry	(48, 49)
cultural heritage	economic value of cultural heritage: synopsis of studies (50)

valuation estimates. A revised and substantially extended valuation study (37) of the disamenity from aggregates extraction was published in 1999. It is currently being used to help determine the size of an “internal tax” to be imposed by the industry on its own member firms, the revenues from which will be used to reduce the disamenity. The U.K. government seeks to raise the internal tax close to the estimate of damage done by extracting 1 ton of aggregates. The agreement then involves the industry receiving a waiver from the government tax, as long as its internal tax is in place.

The summary above excludes project-based economic valuation work, of which there are many examples. However, guidance for the water sector, which has been commissioned by the Environment Agency, has been included. The Agency has overall responsibility for setting and implementing environmental standards in the U.K.. The Environment Agency has shown considerable interest in valuation, and significant effort has gone into devising guidelines on the use of unit monetary values for assessing schemes and policies based on “benefits transfer”. In submitting applications for renewals of existing abstraction licenses or for new water resource projects, water companies must give some estimation of the external environmental costs of the projects in monetary terms wherever possible.

Modifying the National Accounts

To date, few European countries have issued green national accounts. The U.K. has issued some partial accounts (53), but at no point do they include the monetization of any pollution damage. There appear to be limited uses only for the accounts that have been produced, and opposition to full monetization arises largely from the belief that monetary values are still too uncertain to be included. France experimented briefly with “patrimony” accounts in the mid-1980s, but it has been difficult to identify any user who found the accounts valuable. Norway has detailed physical environmental accounts (so-called satellite accounts) that it links to conventional GNP accounts. These show the relationship between economic activity and, say, oil and gas reserve depletion, fishing stocks, etc. Norway has also developed quite sophisticated estimates of the monetary value of air pollution damage (54, 55). At the moment these are not fully integrated into the national accounts but are used to help determine the Norwegian policy stance on Europe-wide acid rain and on domestic environmental issues. While there has been a considerable international “push” for green accounts, it is not obvious that they have met the high expectations of their advocates. In part this is because it is fairly expensive

to construct such accounts, but the more serious issue is that, once formulated, it is unclear how the new accounts can be used to alter behavior. It seems clear that early advocates believed that the pre-occupation in policy circles with GNP would be replaced with a new focus on green indicators. This same expectation has also resulted in a surfeit of “sustainability indicators” throughout Europe. Unfortunately, few of these have a basis in any theory of sustainable development—their alleged purpose. As a result, the impetus to construct comprehensive measures of green accounts has to some extent dissipated.

The Future of Economic Valuation in Policy Appraisal

A retrospective look at the emergence of economic valuation shows that while great advances have been made at the European and U.K. national levels through introducing environmental appraisals in recent years, in the past policy has not always been informed by systematic appraisal techniques. Today, economic valuation is enjoying a revival and is probably more widely used than is realized although its implementation lags significantly behind, for example, the United States. Current usage can be compared to the very sparse adoption of benefit estimation in Europe just a decade ago, as discussed in Barde and Pearce (56). A comparison between Europe and the United States is reported in Navrud and Pruckner (57).

Substantial ambivalence toward its extended use remains, both within government and among regulatory agencies. Some of this resistance may be attributed to a misunderstanding of the techniques, as outlined earlier. However, some objections have substance and need to be addressed.

Doubts exist about the reliability of benefits estimation. The cost of conducting original valuation studies has meant that, often in cases where valuation is required, benefits transfer has been used. There are difficulties in properly implementing this technique, especially when the quantity of original studies available and relevant to the case in question may be very limited. The lack of formal requirements for economic valuation in many areas has meant that in Europe the literature has largely developed from a mix of studies prepared by academics for research interest and by academics and consultancies for individual agencies and government departments. While the number of studies is surprisingly large, it is not generally large enough to provide a statistical basis for benefits transfer, and few practitioners adopt this technique without serious reservations. The validity of transfer is discussed in Brouwer and Langford (58).

Nonetheless, there are some hopeful developments in the context of health effects reported by Dubourg (59).

Additionally, the science of benefits estimation continues to change very rapidly, and consequently it is difficult for even specialists in the field to keep pace with new developments. Policy-makers are even less likely to be able to keep atop of the literature. Significantly, a review of environmental appraisal guidance available worldwide conducted for the U.K. DETR (43) highlighted a general absence of practical guidance on monetary valuation techniques. This would imply that policy-makers who cannot keep up with the literature might be unable to properly assess the work that is completed for them. [Most valuation "manuals" do not in fact guide readers on *how* to engage in valuation. Useful "guidebooks" do exist (61–63).] Understandable ignorance of the literature does account for some continuing hostility to monetization.

In terms of the links between valuation and the design of economic instruments, there has been a paucity of ex post studies of the effectiveness of economic instruments (64), regardless of whether they are based on the results of valuation studies. In part this reflects the relative recent introduction of valuation as an input to designing economic instruments—the results of implementation cannot be assessed until there is sufficient experience, monitoring, and data collection to inform a study. Nonetheless, it has meant that policy-makers have been unable to gauge the accuracy of the predicted effects of policy instruments based on economic valuation techniques. The limited evidence available is favorable as discussed in the OECD report (64). Nonetheless, this has been identified by both the EC and the OECD as a priority for future research.

Finally, there can be no question that economic valuation removes a layer of discretion in decision-making. A policy context in which there is a supporting document saying that benefits are *X* and costs are *Y* and that *X* is greater than (less than) *Y* inhibits the flexibility of decision-makers to make a contrary decision, especially where, as in most cases, high level decision-makers are not familiar with the theoretical underpinnings or even the intuitive rationale for monetization. This accounts for the emphasis on "right process"—i.e., on establishing an acceptable *procedure* for making decisions—rather than "right numbers" in many decision-making contexts.

Nonetheless, economic valuation has potential to significantly inform decision-making. Furthermore, it is important that it does so, since economic efficiency is often easily forgotten in the political process. While a preoccupation with process is understandable, one aim of valuation is to provide a check on the efficiency of decisions, however they are made. There appears to be a wide appreciation of this balancing role for cost–benefit approaches in Europe.

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