

Executive Summary

Introduction

The OECD has long championed efficient decision-making using economic analysis. It was, for example, one of the main sponsors of the early manuals in the late 1960s on project evaluation authored by Ian Little and James Mirrlees.* Since then, cost-benefit analysis has been widely practised, notably in the fields of environmental policy, transport planning, and healthcare. In the last decade or so, cost-benefit analysis has been substantially developed both in terms of the underlying theory and in terms of sophisticated applications. Many of those developments have been generated by the special challenges that environmental problems and environmental policy pose for cost-benefit analysis. The OECD has therefore returned to the subject in this new and comprehensive volume that brings analysts and decision-makers up to date on the main developments.

History and uses of CBA

The history of cost-benefit analysis (CBA) shows how its theoretical origins date back to issues in infrastructure appraisal in France in the 19th century. The theory of welfare economics developed along with the “marginalist” revolution in microeconomic theory in the later 19th century, culminating in Pigou’s *Economics of Welfare* in 1920 which further formalised the notion of the divergence of private and social cost, and the “new welfare economics” of the 1930s which reconstructed welfare economics on the basis of ordinal utility only. Theory and practice remained divergent, however, until the formal requirement that costs and benefits be compared entered into water-related investments in the USA in the late 1930s. After World War II, there was pressure for “efficiency in government” and the search was on for ways to ensure that public funds were efficiently utilised in major public investments. This resulted in the beginnings of the fusion of the new welfare economics, which was essentially cost-benefit analysis, and practical decision-making. Since the 1960s CBA has enjoyed fluctuating fortunes, but is now recognised as the major appraisal technique for public investments and public policy.

Theoretical foundations

The essential theoretical foundations of CBA are: benefits are defined as increases in human wellbeing (utility) and costs are defined as reductions in human wellbeing. For a project or policy to qualify on cost-benefit grounds, its social benefits must exceed its social costs. “Society” is simply the sum of individuals. The geographical boundary for CBA is usually the nation but can readily be extended to wider limits. There are two basic

* Little, I and J. Mirrlees (1974), *Project Appraisal and Planning for Developing Countries*, Oxford, Oxford University Press (The “OECD Manual”).

aggregation rules. First, aggregating benefits across different social groups or nations involves summing willingness to pay for benefits, or willingness to accept compensation for losses (WTP, WTA respectively), regardless of the circumstances of the beneficiaries or losers. A second aggregation rule requires that higher weights be given to benefits and costs accruing to disadvantaged or low income groups. One rationale for this second rule is that marginal utilities of income will vary, being higher for the low income group. Aggregating over time involves discounting. Discounted future benefits and costs are known as present values. Inflation can result in future benefits and costs appearing to be higher than is really the case. Inflation should be netted out to secure constant price estimates. The notions of WTP and WTA are firmly grounded in the theory of welfare economics and correspond to notions of compensating and equivalent variations. WTP and WTA should not, according to past theory, diverge very much. In practice they appear to diverge, often substantially, and with $WTA > WTP$. Hence the choice of WTP or WTA may be of importance when conducting CBA.

There are numerous critiques of CBA. Perhaps some of the more important ones are: a) the extent to which CBA rests on robust theoretical foundations as portrayed by the Kaldor-Hicks compensation test in welfare economics; b) the fact that the underlying “social welfare function” in CBA is one of an arbitrarily large number of such functions on which consensus is unlikely to be achieved; c) the extent to which one can make an ethical case for letting individuals’ preferences be the (main) determining factor in guiding social decision rules; and d) the whole history of neoclassical welfare economics has focused on the extent to which the notion of economic efficiency underlying the Kaldor-Hicks compensation test can or should be separated out from the issue of who gains and loses – the distributional incidence of costs and benefits. CBA has developed procedures for dealing with the last criticism, e.g. the use of distributional weights and the presentation of “stakeholder” accounts. Criticisms a) and b) continue to be debated. Criticism c) reflects the “democratic presumption” in CBA, i.e. individuals’ preference should count.

The stages of CBA

Conducting a well-executed CBA requires the analyst to follow a logical sequence of steps. The first stage involves asking the relevant questions: what policy or project is being evaluated? What alternatives are there? For an initial screening of the contribution that the project or policy makes to social wellbeing to be acceptable, the present value of benefits must exceed the present value of costs.

Determining “standing” – i.e. whose costs and benefits are to count – is a further preliminary stage of CBA, as is the time horizon over which costs and benefits are counted. Since individuals have preferences for when they receive benefits or suffer costs, these “time-preferences” also have to be accounted for through the process of discounting. Similarly, preferences for or against an impact may change through time and this “relative price” effect also has to be accounted for. Costs and benefits are rarely known with certainty so that risk (probabilistic outcomes) and uncertainty (when no probabilities are known) also have to be taken into account. Finally, identifying the distributional incidence of costs and benefits is also important.

Decision rules

Various decision rules may be used for comparing costs and benefits. The correct criterion for reducing benefits and costs to a unique value is the net present value (NPV) or “net benefits” criterion. The correct rule is to adopt any project with a positive NPV and to rank projects by their NPVs. When budget constraints exist, however, the criteria become more complex. Single-period constraints – such as capital shortages – can be dealt with by a benefit-cost ratio (B/C) ranking procedure. There is general agreement that the internal rate of return (IRR) should not be used to rank and select mutually exclusive projects. Where a project is the only alternative proposal to the status quo, the issue is whether the IRR provides worthwhile additional information. Views differ in this respect. Some argue that there is little merit in calculating a statistic that is either misleading or subservient to the NPV. Others see a role for the IRR in providing a clear signal as regards the sensitivity of a project’s net benefits to the discount rate. Yet, whichever perspective is taken, this does not alter the broad conclusion about the general primacy of the NPV rule.

Dealing with costs

The cost component is the other part of the basic CBA equation. As far as projects are concerned, it is unwise to assume that because costs may take the form of equipment and capital infrastructure their estimation is more certain than benefits. The experience is that the costs of major projects can be seriously understated. The tendency for policies is for their compliance costs to be overstated. In other words there may be cost pessimism or cost optimism. In light of this it is important to conduct sensitivity analysis, i.e. to show how the final net benefit figure changes if costs are increased or decreased by some percentage. Ideally, compliance costs would be estimated using general equilibrium analysis.

Politicians are very sensitive about the effects of regulation on competitiveness. This is why most Regulatory Impact Assessment procedures call for some kind of analysis of these effects. A distinction needs to be made between the competitiveness of nations as whole, and the competitiveness of industries. In the former case it is hard to assign much credibility to the notion of competitiveness impacts. In the latter case two kinds of effects may occur. The first is any impact on the competitive nature of the industry within the country in question – *e.g.* does the policy add to any tendencies for monopoly power? If it does then, technically, there will be welfare losses associated with the change in that monopoly power and these losses should be added to the cost side of the CBA, if they can be estimated. The second impact is on the costs of the industry relative to the costs of competing industries in other countries. Unless the industry is very large, it cannot be assumed that exchange rate movements will cancel out the losses arising from the cost increases. In that case there may be dynamic effects resulting in output losses.

Policies to address one overall goal may have associated effects in other policy areas. Climate change and conventional air pollutants is a case in point. Reductions in climate gases may be associated with reductions in jointly produced air pollutants. Should the two be added and regarded as a benefit of climate change policy? On the face of it they should, but care needs to be taken that the procedure does not result in double counting. To address this it is important to consider the counterfactual, i.e. what policies would be in

place without the policy of immediate interest. While it is common practice to add the benefits together, some experts have cast doubt on the validity of the procedure.

Finally, employment effects are usually also of interest to politicians and policy-makers. But the extent to which they matter for the CBA depends on the nature of the economy. If there is significant unemployment, the labour should be shadow priced on the basis of its opportunity cost. In turn this may be very low, i.e. if not used for the policy or project in question, the labour might otherwise be unemployed. In a fully employed economy, however, this opportunity cost may be such as to leave the full cost of labour being recorded as the correct value.

Total economic value

The notion of total economic value (TEV) provides an all-encompassing measure of the *economic value* of any environmental asset. It decomposes into use and non-use (or passive use) values, and further sub-classifications can be provided if needed. TEV does not encompass other kinds of values, such as intrinsic values which are usually defined as values residing “in” the asset and unrelated to human preferences or even human observation. However, apart from the problems of making the notion of intrinsic value operational, it can be argued that some people’s willingness to pay for the conservation of an asset, independently of any use they make of it, is influenced by their own judgements about intrinsic value. This may show up especially in notions of “rights to existence” but also as a form of altruism. Any project or policy that destroys or depreciates an environmental asset needs to include in its costs the TEV of the lost asset. Similarly, in any project or policy that enhances an environmental asset, the change in the TEV of the asset needs to be counted as a benefit. For instance, ecosystems produce many services and hence the TEV of any ecosystem tends to be equal to the discounted value of those services.

Revealed preference valuation

Economists have developed a range of approaches to estimate the economic value of non-market or intangible impacts. There are several procedures that share the common feature of using market information and behaviour to infer the economic value of an associated non-market impact.

These approaches have different conceptual bases. Methods based on hedonic pricing utilise the fact that some market goods are in fact bundles of characteristics, some of which are intangible goods (or bads). By trading these market goods, consumers are thereby able to express their values for the intangible goods, and these values can be uncovered through the use of statistical techniques. This process can be hindered, however, by the fact that a market good can have several intangible characteristics, and that these can be collinear. It can also be difficult to measure the intangible characteristics in a meaningful way.

Travel cost methods utilise the fact that market and intangible goods can be complements, to the extent that purchase of market goods and services is required to access an intangible good. Specifically, people have to spend time and money travelling to recreational sites, and these costs reveal something of the value of the recreational experience to those people incurring them. The situation is complicated, however, by the fact that travel itself

can have value, that the same costs might be incurred to access more than one site, and that some of the costs are themselves intangible (e.g. the opportunity costs of time).

Averting behaviour and defensive expenditure approaches are similar to the previous two, but differ to the extent that they refer to individual behaviour to avoid negative intangible impacts. Therefore, people might buy goods such as safety helmets to reduce accident risk, and double-glazing to reduce traffic noise, thereby revealing their valuation of these bads. However, again the situation is complicated by the fact that these market goods might have more benefits than simply that of reducing an intangible bad.

Finally, methods based on cost of illness and lost output calculations are based on the observation that intangible impacts can, through an often complex pathway of successive physical relationships, ultimately have measurable economic impacts on market quantities. Examples include air pollution, which can lead to an increase in medical costs incurred in treating associated health impacts, as well as a loss in wages and profit. The difficulty with these approaches is often the absence of reliable evidence, not on the economic impacts, but on the preceding physical relationships.

Stated preference valuation: contingent valuation

Stated preference techniques of valuation utilise questionnaires which either directly ask respondents for their willingness to pay (accept), or offer them choices between “bundles” of attributes and from which choices the analysts can infer WTP (WTA).

Stated preference methods more generally offer a direct survey approach to estimating individual or household preferences and more specifically WTP amounts for changes in provision of (non-market) goods, which are related to respondents’ underlying preferences in a consistent manner. Hence, this technique is of particular worth when assessing impacts on non-market goods, the value of which cannot be uncovered using revealed preference methods.

This growing interest in stated preference approaches has resulted in a substantial evolution of techniques over the past 10 to 15 years. For example, the favoured choice of elicitation formats for WTP questions in contingent valuation surveys has already passed through a number of distinct stages. This does not mean that uniformity in the design of stated preference surveys can be expected any time soon. Nor is this particularly desirable. Some studies show how, for example, legitimate priorities to minimise respondent strategic bias by always opting for incentive compatible payment mechanisms must be balanced against equally justifiable concerns about the credibility of a payment vehicle. The point is the answer to this problem is likely to vary across different types of project and policy problems.

There remain concerns about the validity and reliability of the findings of contingent valuation studies. Indeed, much of the research in this field has sought to construct rigorous tests of the robustness of the methodology across a variety of policy contexts and non-market goods and services. By and large, one can strike an optimistic note about the use of the contingent valuation to estimate the value of non-market goods. In this interpretation of recent developments, there is a virtuous circle between translating the lessons from tests of validity and reliability into practical guidance for future survey design. Indeed, many of the criticisms of the technique can be said to be imputable to problems at the survey design and implementation stage rather than to some intrinsic

methodological flaw. Taken as a whole, the empirical findings largely support the validity and reliability of contingent valuation estimates.

Stated preference valuation: choice modelling

Many types of environmental impact are multidimensional in character. Hence an environmental asset that is affected by a proposed project or policy often will give rise to changes in component attributes each of which command distinct valuations. The application of choice modelling (CM) approaches to valuing multidimensional environmental problems has been growing steadily in recent years. CM is now routinely discussed alongside the arguably better-known contingent valuation method in state-of-the-art manuals regarding the design, analysis and use of stated preference studies. While there are a number of different approaches under the CM umbrella, it is arguably the *choice experiment* variant (and to some extent, *contingent ranking*) that has become the dominant CM approach with regard to applications to environmental goods. In a choice experiment, respondents are asked to choose their most preferred option from a choice set of at least two options, one of which is the status quo or current situation. It is this CM approach that can be interpreted in standard welfare economic terms, an obvious strength where consistency with the theory of cost-benefit analysis is a desirable criterion.

Much of the discussion about, for example, validity and reliability issues in the context of contingent valuation (CV) studies applies in the context of the CM. While it is likely that on some criteria, CM is likely to perform better than CV – and *vice versa* – the evidence for such assertions is largely lacking at present. While those few studies that have sought to compare the findings of CM and CV appear to find that the total value of changes in the provision of the same environmental good in the former exceeds that of the latter, the reasons for this are not altogether clear. However, whether the two methods should be seen as always competing against one another – in the sense of say CM being a more general and thereby superior method – is debatable. Both approaches are likely to have their role in cost-benefit appraisals and a useful contribution of any future research would also be to aid understanding of when one approach should be used rather than the other.

Option value

The notion of *quasi option value* was introduced in the environmental economics literature some three decades ago. In parallel, financial economists developed the notion of “*option value*”. QOV is not a separate category of economic value. Rather it is the difference between the net benefits of making an optimal decision and one that is not optimal because it ignores the gains that may be made by delaying a decision and learning during the period of delay. Usually, QOV arises in the context of irreversibility. But it can only emerge if there is uncertainty which can be resolved by learning. If the potential to learn is not there, QOV cannot arise.

Can QOV make a significant difference to decision-making? Potentially, yes. It is there to remind us that decisions should be made on the basis of maximum feasible information about the costs and benefits involved, and that includes “knowing that we do not know”. If this ignorance cannot be resolved then nothing is to be gained by delay. But if information can resolve it, then delay can improve the quality of the decision. How large the gain is

from this process is essentially an empirical question since QOV is the difference in the net benefits of an optimal decision and a less than optimal one.

WTP versus WTA?

Traditionally, economists have been fairly indifferent about the welfare measure to be used for economic valuation: willingness to pay (WTP) and willingness to accept compensation (WTA) have both been acceptable. By and large, the literature has focused on WTP. However, the development of stated preference studies has, fairly repeatedly, discovered divergences, sometimes substantial ones, between WTA and WTP. These differences still would not matter if the nature of property rights regimes were always clear. WTP in the context of a potential improvement is clearly linked to rights to the status quo. Similarly, if the context is one of losing the status quo, then WTA for that loss is the relevant measure. By and large, environmental policy tends to deal with improvements rather than deliberate degradation of the environment, so there is a presumption that WTP is the right measure. The problems arise when individuals can be thought of as having some right to a future state of the environment. If that right exists, their WTP to secure that right seems inappropriate as a measure of welfare change, whereas their WTA to forego that improvement seems more relevant. In practice, the policy context may well be one of a mixture of rights, *e.g.* a right to an improvement attenuated by the rights of others not to pay “too much” for that improvement.

Finding out why, empirically, WTA and WTP differ also matters. If there are legitimate reasons to explain the difference then the preceding arguments apply and one would have to recommend that CBA should always try to find both values. The CBA result would then be shown under both assumptions. But if the observed differences between WTA and WTP are artefacts of questionnaire design, there is far less reason to be concerned at the difference between them. The fallback position of their approximate equality could be assumed. Unfortunately, the literature is undecided as to why the values differ. This again suggests showing the CBA results under both assumptions about the right concept of value.

Valuing ecosystem services

Research is now being conducted on the value of ecosystem services. The aim is to estimate the total economic value (TEV) of ecosystem change. The problems with valuing changes in ecosystem services arise from the interaction of ecosystem products and services, and from the often extensive uncertainty about how ecosystems function internally, and what they do in terms of life support functions. Considerable efforts have been made to value specific services, such as the provision of genetic information for pharmaceutical purposes. The debate on that issue usually shows how complex valuing ecosystem services can be. But even that literature is still developing, and it does not address the interactive nature of ecosystem products and services.

Once it is acknowledged that ecosystem functioning may be characterised by extensive uncertainty, by irreversibility and by non-linearities that generate potentially large negative effects from ecosystem loss or degradation, the focus shifts to how to behave in

the face of this combination of features. The short answer is that decision-making favours precaution. But just what precaution means is itself a further debate.

Discounting

Some advances have been prompted by the alleged “tyranny of discounting” – the fact that discounting has a theoretical rationale in the underlying welfare economics of CBA, but with consequences that many seem to find morally unacceptable. This unacceptability arises from the fact that distant future costs and benefits may appear as insignificant present values when discounting is practised. In turn, this appears to be inconsistent with notions of intergenerational fairness. Current activities imposing large costs on future generations may appear insignificant in a cost-benefit analysis. Similarly, actions now that will benefit future generations may not be undertaken in light of a cost-benefit analysis.

The weakness of the conventional approach, which assumes that one positive discount rate is applied for all time, is that it neither incorporates uncertainty about the future nor attempts to resolve the tyranny problem. Additionally, the assumption of a constant discount rate is exactly that – an assumption. The “escapes” from the tyranny problems centre on several approaches.

First, many studies find that very often (but not always), people actually discount “hyperbolically”, i.e. people actually do use time-declining discount rates. If what people do reflects their preferences, and if preferences are paramount, there is a justification for adopting time-declining discount rates.

Second, there is also uncertainty about future interest rates: here it can be shown that uncertainty about the temporal weights – i.e. the *discount factor* – is consistent with a time-declining certainty equivalent *discount rate*. Introducing uncertainty about the state of the economy more generally can be shown also to generate time-declining rates, if certain conditions are met.

Third, by positing the “tyranny” problem as a social choice problem in which neither the present nor the future dictates outcomes, and adopting reasonable ethical axioms can be shown to produce time-declining rates.

In terms of the uncertainty and social choice approaches, the time-path of discount rates could be very similar with long term rates declining to the “lowest possible” rates of, say, 1%.

But time-consistency problems remain and some experts would regard any time-declining discount rate as being unacceptable because of such problems. Others would argue that the idea of a long-run optimising government that never revises its “optimal” plan is itself an unrealistic requirement for the derivation of an optimal discount rate.

Valuing health and life

Considerable strides have been made in recent years in terms of clarifying both the meaning and size of the “value of a statistical life” (VOSL). One of the main issues has been how to “transfer” VOSLs taken from non-environmental contexts to environmental contexts. Non-environmental contexts tend to be associated with immediate risks such as accidents. In contrast, environmental contexts are associated with both immediate and future risks. The futurity of risk may arise because the individual in question is not at

immediate risk from *e.g.* current levels of pollution but is at risk in the future when there is greater vulnerability to risk. Or futurity may arise because the risk is latent as with diseases such as asbestosis or arsenicosis. All this suggests *a)* that valuations of immediate risk might be transferred to environmental immediate risk contexts (provided that the perception of the risk is the same) but *b)* future risks need to be valued separately.

In terms of practical guidelines, the age of the respondent who is valuing the risk matters. Age may or may not be relevant in valuing immediate risks – the literature is ambiguous. The general rule, then, is to ensure that age is controlled for in any primary valuation study. For “benefits transfer” the rule might be one of adopting a default position in which immediate risks are valued the same regardless of age (*i.e.* the VOSL does not vary with age), with sensitivity analysis being used to test the effects of lower VOSLs being relevant for older age groups. Age is very relevant for valuing future risks. Thus a policy which lowers the general level of exposure to pollution should be evaluated in terms of the (lower than immediate VOSL) valuations associated with younger people’s valuations of future risks, plus older persons’ valuation of that risk as an immediate risk.

Some environmental risks fall disproportionately on the very young and the very old. A complex issue arises with valuing risks to children. The calculus of willingness to pay now seems to break down since children may have no income to allocate between goods, including risk reduction, may be ill-informed about or be unaware of risks, and may be too young to articulate preferences anyway. The result is that adults’ valuations of the risks *on behalf of* children need to be estimated. The literature on which to base such judgements is only now coming into existence. Preliminary findings suggest that the resulting values of WTP may be higher for adults valuing on behalf of children than they are for adults speaking on behalf of themselves. The safest conclusion at this stage is that bringing the effects on children into the domain of CBA is potentially important, with a default position being to use the adult valuations of “own” life risks for the risks faced by children.

Equity

One important issue is equity or the distributional incidence of costs and benefits. Incorporating distributional concerns implies initially identifying and then possibly weighting the costs and benefits of individuals and groups on the basis of differences in some characteristic of interest (such as income or wealth). First, there is the relatively straightforward but possibly arduous task of assembling and organising raw (*i.e.* unadjusted) data on the distribution of project costs and benefits. Second, these data could then be used to ask what weight or distributional adjustment would need to be placed on the net benefits (net costs) of a societal group of interest for a given project proposal to pass (fail) a distributional cost-benefit test. Third, explicit weights reflecting judgement about society’s preferences towards distributional concerns can be assigned and net benefits re-estimated on this basis.

A crucial question then is where should cost-benefit analysts locate themselves upon this hierarchy? Given that cost-benefit appraisals are sometimes criticised for ignoring distributional consequences altogether then the apparently simplest option of cataloguing how costs and benefits are distributed could offer valuable and additional insights. This suggests that, at a minimum, cost-benefit appraisals arguably should routinely provide these data. Whether more ambitious proposals should be adopted is a matter of

deliberating about whether: first, the gains in terms of being able to scrutinise the (weighted) net benefits of projects in the light of societal concerns about both efficiency and equity outweighs; second, the losses arising from the need for informed guesswork in interpreting the empirical evidence with regards to the treatment of the latter.

On the one hand, empirical evidence about the “correct” magnitudes of distributional weights can be usefully employed in distributional CBA as its application to the case of climate change illustrates. On the other hand, even apparently small changes in assumptions about the size of distributional weights – indicated by the range of values in available empirical studies – can have significant implications for recommendations about a project’s social worth. This finding should not be a surprise for it primarily reflects the complexity involved in trying to disentangle society’s distributional preferences. As a practical matter, the danger is whether the most ambitious proposals for distributional CBA generate more heat than light. While it would be worthwhile for research to seek further understanding of these preferences – perhaps making greater use of stated preference methods – in the interim, estimating implicit weights might be the most useful step beyond the necessary task of cataloguing the distribution of project cost and benefits.

Sustainability and CBA

While there remains a debate about what it means for development to be sustainable, there is now a coherent body of academic work that has sought to understand what a sustainable development path might look like, how this path can be achieved and how progress towards it might be measured. Much of this work considers the pursuit of sustainable development to be an aggregate or macroeconomic goal. Comparatively little attention has been paid to the implications of notions of sustainability for CBA. However, a handful of recommendations do exist with regards to how cost-benefit appraisals can be extended to take account of recent concerns about sustainable development.

According to one perspective there is an obvious role for appraising projects in the light of these concerns. This notion of strong sustainability starts from the assertion that certain natural assets are so important or critical (for future, and perhaps current, generations) so as to warrant protection at current or above some other target level. If individual preferences cannot be counted on to fully reflect this importance, there is a paternal role for decision-makers in providing this protection. With regards to the relevance of this approach to cost-benefit appraisals, a handful of contributions have suggested that sustainability is applicable to the management of a *portfolio* of projects. This has resulted in the idea of a shadow or compensating project. For example, this could be interpreted as meaning that projects that cause environmental damage are “covered off” by projects that result in environmental improvements. The overall consequence is that projects in the portfolio, on balance, maintain the environmental status quo.

There are further ways of viewing the problem of sustainable development. Whether these alternatives – usually characterised under the heading “weak sustainability” – are complementary or rivals has been a subject of debate. This debate would largely dissolve if it could be determined which assets were critical. As this latter issue is itself a considerable source of uncertainty, the debate continues. However, the so-called “weak” approach to sustainable development is useful for a number of reasons. While it has primarily been viewed as a guide to constructing green national accounts (i.e. better measures of income,

saving and wealth), the focus on assets and asset management has a counterpart in thinking about project appraisal. For example, this might emphasise the need for an “asset check”. That is, what the stocks of assets are before the project intervention and what they are likely to be after the intervention? It might also add another reason for the tradition in cost-benefit analysis of giving greater weight to projects which generate economic resources for saving and investment in economies where it is reckoned that too little net wealth (per capita) is being passed on to future generations.

Benefits transfer

Benefits or value transfer involves taking economic values from one context and applying them to another. Transfer studies are the bedrock of practical policy analysis in that only infrequently are policy analysts afforded the luxury of designing and implementing original studies. In general then, analysts must fall back on the information that can be gleaned from past studies. This is likely to be no less true in the case of borrowing or transferring WTP values to policy questions involving environmental or related impacts. Almost inevitably, benefits transfer introduces subjectivity and greater uncertainty into appraisals in that analysts must make a number of *additional* assumptions and judgements to those contained in original studies. The key question is whether the added subjectivity and uncertainty surrounding the transfer is acceptable and whether the transfer is still, on balance, informative.

Surprisingly given its potentially central role in environmental decision-making, there are no generally accepted practical transfer protocols to guide analysts. However, a number of elements of what might constitute best practice in benefits transfer might include the following. First, the studies included in the analysis must themselves be sound. Initial but crucial steps of any transfer are very much a matter of carefully scrutinising the accuracy and quality of the original studies. Second, in conducting a benefits transfer, the study and policy sites must be similar in terms of population and population characteristics. If not then differences in population, and their implications for WTP values, need to be taken into account. Just as importantly, the change in the provision of the good being valued at the two sites also should be similar.

The holy grail of benefits transfer is the consolidation of data on non-market values in emerging transfer databases. Yet, while databases are to be welcomed and encouraged, these developments still need to be treated with some caution. Thus, there is a widely acknowledged need for more research to secure a better understanding of when transfers work and when they do not as well as developing methods that might lead to transfer accuracy being improved.

However, a competent application of transfer methods demands informed judgement and expertise and sometimes, according to more demanding critics, as advanced technical skills as those required for original research. At the very least, it suggests that practitioners should be explicit in their analysis about important caveats regarding a proposed transfer exercise as well as take account of the sensitivity of their recommendations to changes in assumptions about economic values based on these transfers.

CBA and other decision-making guidance

A significant array of decision-guiding procedures are available and include cost-effectiveness analysis (CEA) and multi-criteria analysis (MCA). These procedures vary in their degree of comprehensiveness, where this is defined as the extent to which all costs and benefits are incorporated. In general, only MCA is as comprehensive as CBA and may be more comprehensive once goals beyond efficiency and distributional incidence are considered. All the remaining procedures either deliberately narrow the focus on benefits, *e.g.* to health or environment, or ignore cost. Procedures also vary in the way they treat time. Environmental Impact Assessment and Life Cycle Analysis are essential inputs into a CBA, although the way these impacts are dealt with in “physical terms” may not be the same in a CBA. They are not decision-making procedures in their own right. Risk assessments tend to be focused on human health only but ecological risk assessments are also fairly common. Once again, neither enables a comprehensive decision to be made.

Some political economy

Political economy, or “political economics”, seeks to explain why the economics of the textbook is rarely embodied in actual decision-making. CBA is very much a set of procedures derived from an analytical framework that is as theoretically “correct” as possible. Unsurprisingly, actual decisions may be made on very different bases to this analytical approach. The reasons lie in the role played by “political” welfare functions rather than the social welfare functions of economics, distrust about or disbelief in monetisation, the capture of political processes by those not trained in economics, beliefs that economics is actually “common sense” and easily understood, and, of course, genuine mistrust of CBA and its theoretical foundations based on the debates that continue within the CBA community and outside it. But explaining the gap between actual and theoretical design is not to justify the gap. Theoretical economists need a far better understanding of the pressures that affect actual decisions, but those who make actual decisions perhaps also need a far better understanding of economics.