COST-BENEFIT ANALYSIS – IS IT WORTH IT?

COMPARING APPLES AND ORANGES

CHARLES MORGAN
Six Pump Court, Temple, London[1]

INTRODUCTION

> The English lawyer has been notoriously unwilling to admit the relevance of social sciences to his discipline. In part, this may be attributed to his lack of formal training in economics or sociology.[2]

I for one own up to all of the above.[3] However, practitioners of environmental law must strive to meet or to disarm this criticism; one fundamental function of environmental law is the striking of a balance between human activities and the requirements of the rest of the natural world (including other humans) upon which those activities impact. It is difficult to do so successfully and in a justifiable manner without using some of the techniques of the social sciences. Candidates include the widely applied economic process of cost-benefit analysis (CBA), which at any rate *attempts* to put the balancing exercise onto a quantitative footing rather than leaving it to that strange thing called 'judgment' or 'discretion'.

CBA is also referred to as 'cost-benefit assessment', 'cost-benefit appraisal' and 'benefit-cost analysis'. Its purpose, as the title of this article might suggest, is to answer the question: 'Is it worth it?', where 'it' might be anything from the erection of a barrier on the central reservation of a section of motorway to getting married. However, the thrust of this article is rather to explore, in the particular context of environmental decision making and its contentious examination, the anterior question: 'Is CBA itself worth it?' In other words, is the carrying out of such an exercise worthwhile in terms of meaningfulness of outcome? The article will not provide the reader with anything more than the most potted summary of the technical principles of CBA and will concentrate instead upon (1) identifying those areas in which, explicitly or implicitly, environmental law requires or contemplates the carrying-out of CBA and (2) considering the utility of doing so.

Another way of describing CBA would be 'weighing up the pros and the cons' of a proposed course of action. The *quasi*-quantitative nature of the exercise is explicit in that expression, even though it is usually used to describe an exercise carried out without any attempt whatsoever at actual quantification. Take the earlier example of deciding whether or not to get married (either at all or to a particular individual). A whole host of pros and cons may instantly spring to mind; of what they consist may differ from mind to mind, as too most certainly will the relative 'weight' to be attached to each of them. Yet that 'weight' will not be truly quantified by the decision maker; at most a particular consideration might be categorised as 'very important (indeed)', 'important', 'not particularly important', 'unimportant' or similar, but the overall 'weighing' exercise is done intuitively or emotively and not (at any rate in the vast majority of cases) by the attribution of numerical values, positive or negative, followed by a final summation. Is that because to do the latter would be meaningless, or would the usefulness of the exercise and the success of its outcome be improved by a quantitative, *quasi* quantitative or even *pseudo* quantitative process?

This falls to be considered, in circumstances of varying ease of recognition and application, in many contexts in environmental law. In those contexts, there is usually at least the starting point of a belief in there being a single, objectively correct outcome (whereas whether or whom to marry obviously merits different answers for different individuals). The challenge is how to arrive at it. In trying to do so, that same belief may prove to be an over-optimistic illusion. The answer which emerges is ultimately dependent upon the subjective importance, both absolute and relative, attached to the considerations being 'weighed'.

It will be suggested that the result of this is that, despite all its increasing sophistication, CBA remains a largely unsound basis for seeking to attribute any *absolute* value, positive or negative, to any particular proposed course of action or inaction capable of affecting the environment. That is fundamentally because the identification of all the things to be valued, the choice of method of valuation of each of them and the actual attribution of values according to that method are each ultimately 'as broad as they are long' (to use an apt turn of phrase). Where CBA has a useful role to play is in determining the *relative* merits and demerits of a number of competing courses of action (perhaps including inaction) which are 'valued' by identical criteria. To give a simple analogy: if you were asked to assess the actual height of a solitary cuboid block of concrete some distance away in a desert or prairie, with no useful point of reference or comparison, you might struggle to do so even approximately and with any degree of confidence. If, however, you were invited to rank 10 such structures in order of height, and told that they were all the same distance away, you would do so relatively easily and confidently, whilst still wholly unsure of the actual height of any of them. Provided that the parameters of a CBA exercise are carefully and intelligently chosen, a similar degree of utility can be achieved.[4]

1 With thanks to Dr Greg O'Donnell, Senior Researcher in Land Use Management Effects in Extreme Floods, Newcastle University for initial direction with academic research and Mark Davies, pupil at Six Pump Court for 'readability check' and proofreading.

2 A I Ogus, G M Richardson 'Economics and the environment: a study of private nuisance' (1977) 36(2) *Cambridge Law Journal* 284.

3 Although, in my defence, I have completed (somewhat indifferently) a Part I Tripos in Archaeology and Anthropology, which included some elements of sociology.

4 Even perhaps in the case of spouse selection, but that is outside the scope of this article and the journal in which it appears.

Legal issues relating to CBA have arisen in the context of the regulation of the water industry, which will be addressed below after a summary of its general principles and application to environmental law.

THE GENERAL PRINCIPLES OF COST-BENEFIT ANALYSIS

CBA is defined as, 'analysis which quantifies in monetary terms as many of the costs and benefits of a proposal as feasible, including items for which the market does not provide a satisfactory measure of economic value'.[5]

Benefits are generally defined as increases in human well-being and costs are defined as reductions in human well-being.[6] In the case of an environmental project, the direct financial expenditure on its execution will constitute at least an element of its costs. It may be the only element, or the only one reasonably capable of accurate quantification, although there may be others – eg if a reservoir is created it may permanently render journeys between two towns longer and thus more expensive, a future cost which is potentially capable of quantification. Whether a particular cost counts at all depends upon the analyst's methodology, in this example whether and to what extent account is to be taken of costs falling upon third parties and of future costs. If future costs are to be taken into account (in which case one would also include the running costs of the reservoir), then both a time period and a method of discounting to present value must be determined.[7]

Costs to third parties are referred to as 'externalities'. Recognition of such externalities is central to environmental regulation. Pollution is a common externality to industrial activity and the maxim 'the polluter pays' is a pithy recognition of that. The 'producer responsibility' measures of EU environmental law are a good illustration of the economic capturing of externalities, in their case by ensuring that the cost of the end-of-life disposal of any product within their scope is imposed upon the producer and thus 'internalised' in the increased price of the product, leaving each consumer then to perform his or her own mini-CBA by deciding whether, despite its increased price, the product remains 'worth it'. One striking example is that of fluorescent lamps; the effect of the UK implementation of the WEEE Directive was to increase overnight the unit price to the consumer of domestic tube lighting by approximately 25–30p, a reflection of the high cost of its safe disposal arising out of its mercury content. This renders it commensurately less attractive than, say, a halogen lamp (outwith the scope of the Directive)[8] but the latter suffers from higher energy consumption for any given light output. Lifespan also differs. The consumer must choose. The producer is in turn incentivised to devise new products whose safe disposal is less expensive.

In the environmental context, benefits too may be external to the project. Whilst the benefits of some projects could sensibly be measured simply by reference to their internal impact upon the profit and loss account or balance sheet of the promoter of the project (eg a private reservoir to serve the needs of a specific commercial concern), in many instances the whole purpose of an environmental project is to achieve some wider external benefit. This is particularly so in the case of projects driven by regulation, which, left to the economic free will of the operator executing them, would never occur at all.

CBA has sought to develop techniques to value these costs and benefits. These will be briefly addressed. However, as eminent an environmental law practitioner as Professor Ludwig Kramer[9] summed it all up at the UK Environmental Law Association conference in Cambridge in 2013 in one pithy, rhetorical question: 'How can you place an economic value on a butterfly?'. The equally pithy answer is: 'You can't'. A more elaborate rhetorical answer might be: 'Actually, you can place any economic value you like on a butterfly. Take your pick, according to your purpose and desired outcome'. The question calls to mind the 'butterfly effect' metaphor in chaos theory, ie the proposition that the act of a single butterfly flapping its wings in Brazil might cause a chain of events culminating in a tornado in Texas – or indeed, with equal likelihood, preventing one.[10] This neatly illustrates for present purposes how the value one might attach to a butterfly depends very much upon how wide one casts one's butterfly net in the first place (to mix one's metaphors a little).

A classic CBA technique for valuation of costs or benefits is either directly or indirectly to seek to determine the value that affected individual members of society attach to their existence or non-existence (stated preference valuations). Thus, a person may be asked how much he or she would be willing to pay (WTP) to obtain a particular environmental improvement or willing to accept (WTA) to forego it. These questions might be asked directly by survey and questionnaire in relation to one project or type of project but then also used (with or without modification) as a guide in other cases to avoid the cost of a second survey (value transfer or benefits transfer). The basic problems are such things as: 'Who do you ask?' and 'What do you ask them?'.[11] It is recognised that the determination of such matters can fundamentally affect the result.[12] For example, if you took a person to a local discharging combined sewer overflow (CSO) you might ask that person: 'How much more would you be willing to pay through your annual sewerage services charges to have that discharge prevented?' (a WTP survey). The answer might depend upon a great number of things, including the age of the person, the proximity of their home to the

5 HM Treasury *The Green Book: Appraisal and Evaluation in Central Government* (2003 edn with 2011 amendments, The Stationery Office 2011) para 2.3.

6 OECD *Cost-Benefit Analysis and the Environment: Recent Developments* (OECD Publishing 2016); however, see the wider definition of costs in s 56 of the Environment Act 1995.

7 One criticism of both discounting and the setting of time horizons is that each tends to undervalue the impact of harmful activities upon future generations.

8 Not to be confused with metal halide lamps, which are within scope.

9 Formerly head of the Legal Unit of DG Environment, European Commission, now a Senior Counsel to ClientEarth (amongst other positions). See L Kramer 'EU environmental law and policy over the last 25 years – good or bad for the UK?' *Environmental Law & Management* 25(2–3) 48.

10 E N Lorenz 'Predictability: Does the Flap of a Butterfly's Wings in Brazil Set Off a Tornado in Texas?' paper presented at the American Association for the Advancement of Science (139th Meeting December 1972).

11 The CBA protagonist would rather regard these as simply 'things to be decided'.

12 Any advocate faces similar dilemmas on an almost daily basis in the courtroom.

CSO, the frequency with which they actually walked past it, the recreational use (if any) they made of the watercourse into which it discharged, their general attitude towards welfare of fish and broader environmental issues etc. Let us suppose that one such person answers: '£5' (perhaps because she has been asked expressly if she would be willing to pay that particular amount). She is then told that, actually, within a similar distance from her house (or discharging into the same stretch of watercourse), there are altogether 10 CSOs of similarly unsatisfactory performance. Would she, then, be prepared to pay an extra £5 x 10 = £50 a year to see them all cleaned up? The answer would almost certainly be: 'No'. If the first question posed had drawn attention to all 10, the answer might still have been just £5.

Further, if the question had been instead in the form of: 'How much would you be willing to accept as a discount to your annual sewerage charges to continue to put up with the consequences of this discharge?' (a WTA survey), the answer might have been different again. The general experience is that the WTA figure will exceed that for WTP and great debate and learning has been devoted to the circumstances in which one or the other is the more appropriate approach, the framing of questions, the provision of information relevant to the answers and the significance of 'choice modelling'.

COST-BENEFIT ANALYSIS IN ENVIRONMENTAL REGULATION

As already noted above, value for money looms large in the context of expenditure driven by environmental regulation. This was recognised in the Environment Act 1995 (EA 1995), which created the 'new Agencies', ie the Environment Agency in England and SEPA in Scotland. So far as the Environment Agency was concerned, section 4 ('Principal aim and objectives of the Agency') provided that:

> (1) It shall be the principal aim of the Agency (subject to and in accordance with the provisions of this Act or any other enactment and *taking into account any likely costs*) in discharging its functions so to protect or enhance the environment, taken as a whole, as to make the contribution towards attaining the objective of achieving sustainable development mentioned in subsection (3) below.
> (2) The Ministers shall from time to time give guidance to the Agency with respect to objectives which they consider it appropriate for the Agency to pursue in the discharge of its functions.
> (3) The guidance given under subsection (2) above must include guidance with respect to the contribution which, having regard to the Agency's responsibilities and resources, the Ministers consider it appropriate for the Agency to make, by the discharge of its functions, towards attaining the objective of achieving sustainable development.[13]

In contrast, SEPA, with its narrower statutory remit, was given no 'principal aim', but section 31 contained in respect of SEPA provision for the giving of similar guidance by the Secretary of State[14] in relation to the performance of its functions. Section 39 ('General duty of the new Agencies to have regard to costs and benefits in exercising powers')[15] provided that:

> (1) Each new Agency—
> (a) in considering whether or not to exercise any power conferred upon it by or under any enactment, or
> (b) in deciding the manner in which to exercise any such power,
> shall, unless and to the extent that it is unreasonable for it to do so in view of the nature or purpose of the power or in the circumstances of the particular case, *take into account the likely costs and benefits* of the exercise or non-exercise of the power or its exercise in the manner in question.
> (2) The duty imposed upon a new Agency by subsection (1) above does not affect its obligation, nevertheless, to discharge any duties, comply with any requirements, or pursue any objectives, imposed upon or given to it otherwise than under this section.

Section 56 defines 'costs' as including costs to any person and costs to the environment. 'Benefits' are undefined.

This provision was novel and controversial, with fears that it would gum up the wheels of regulation with endless scope for argument over costs and benefits and frequent judicial review, the difficult onus being upon the regulator to demonstrate in respect of any act of increased regulation that its benefits exceeded its costs. The government expressed the view in Parliament that this outcome would not occur, indicating its view that the provision fell far short of requiring the Agencies to do so.[16] This optimism has proved well founded; there is not a single reported case of judicial review challenging the Agencies' discharge of their duties under section 39. Thus, it would seem that contemporary legal commentators were correct in suggesting that the duty is so generally expressed – to 'take into account the likely costs and benefits' – that it does not require a determination that benefits exceed costs before a power is exercised, and that even a finding that they do not is not of itself a conclusive legal reason against the exercise of the power.[17]

The statutory guidance that was then issued under section 4 was consistent with this.[18] As far as the Environment Agency was concerned, it contained the following:

> These provisions recognise that sustainable development involves reconciling the need for economic development with that for protecting and enhancing the environment, without compromising the ability of future generations to meet their own needs. Ministers consider that as the Agency is a body with powers to make decisions with significant impacts on

13 EA 1995 s 4 is set out as originally enacted (emphasis added); references to 'the Ministers' have now been replaced by references to the Secretary of State, by provisions within the Natural Resources Body for Wales (Functions) Order SI 2013/755.

14 Latterly the Scottish Ministers.

15 EA 1995 s 39 is set out as originally enacted (emphasis added), as amended by the Regulatory Reform (Scotland) Act 2014 ASP 3 (Scottish Act) it now refers to 'the Agency', defined in s 37(1) as meaning for the purposes of Part I of the EA 1995 the Environment Agency or SEPA; nevertheless, the heading to Part I, Chapter III describes its contents (including s 37) as relating also to Natural Resources Wales.

16 HC Standing Committee B, 9th Sitting (18 May 1995) cols 284–85.

17 See eg S Bell, D McGillivray, O Pedersen *Environmental Law* (8th edn Oxford University Press Oxford 2013); see also the annotations to EA 1995 s 39 in M Poustie, S Tromans *Environmental Protection Legislation 1990–2002* (Sweet & Maxwell 2003), which survive unchanged in I Cowan et al *Encyclopaedia of Environmental Law* (Sweet & Maxwell).

18 DoE, MAFF and WO *The Environment Agency and Sustainable Development* (1996) Chapter 5 'Costs and benefits', superseded by Defra, *The Environment Agency's Objectives and Contribution to Sustainable Development: Statutory Guidance* (December 2002) (emphasis added).

> individuals, organizations and the environment, *it should take account of all types of costs and benefits* when making such decisions. This will not only ensure that financial and other considerations are taken into account, but also that environmental considerations are given the central role that is necessary for sustainable development. But the duty does not apply in cases where it would be unreasonable, nor can it be used to override other statutory requirements.

These requirements all fall well short of constituting a duty to perform a full-blown CBA. Any such requirement would in fact have been a much greater recipe for dispute (not to mention expense and effort), since it would have necessitated the adoption and justification of specific methodologies and techniques, the 'correctness' or appropriateness of each step of which would be fertile ground for challenge. The imposition of only a very generalised duty, expressed in the broadest of terms, in truth acknowledges the ultimate futility of supposedly quantitative exercises as a means of determining the absolute 'worth' of a proposed exercise of statutory power.

The Environment Agency produced its own internal guidance, 'Taking Account of Costs and Benefits',[19] which attempted to put on a practical footing the steer it was being given. In section 4, 'Putting the Duty into Practice', the Environment Agency concluded that where the standards or targets to be reached were set by law, the result of section 39(2) was that 'the benefits have already been decided and the task for the Agency is then one of achieving the target at least cost', ie of 'cost-effectiveness analysis'. This is essentially a process of comparison or 'ranking'. Where the outcome was discretionary, then despite the consensus that no CBA was required, the Environment Agency nevertheless considered it a useful starting point, with the complexity and refinement of the analysis being set by the value of the project. The need to maintain an 'audit trail' was stressed.

The Environment Agency also developed its own Benefits Assessment Guidance for use in the 2004 Periodic Review of price limits for the water industry (PR04),[20] principally to assess discretionary schemes proposed under the National Environment Programme, ie schemes that were not effectively mandated under section 39(2) by the obligation to achieve practical implementation of EU water quality directives or otherwise. The Benefits Assessment Guidance is a substantial document with sophisticated advice as to the conduct of environmental CBA. It is, in turn, much informed by the guidance in the Treasury 'Green Book',[21] the 'bible' of central government CBA. The current edition of the Green Book, however, acknowledges that:

> It is not easy to derive economic values for damage costs of water pollutants. The complexity of the way in which pollutants entering the water environment affect chemical water quality and ecological status means that it is difficult to devise simple dose-response functions. Furthermore, there are several ways in which the benefits of improving water quality are location-dependent and it is not easy to determine the relevant population to use for grossing up values, or how to take account of decay functions to represent 'distance decay'. Therefore, water valuation studies do not generally produce 'marginal damage cost' estimates for specific pollutants; they are more geared towards producing values for observable changes in environmental quality.
>
> Numerous studies have attempted to estimate the economic value of changes to water quality or flow rates/levels in water bodies, but establishing values that can be transferred is difficult. New research is planned by Defra, the Environment Agency and OFWAT to value the environmental benefits of changes in water quality.[22]

It also notes that the Environment Agency has a register of 50 water valuation studies, which covers values for recreation, water quality, flood defence, navigation and fishing.[23]

COST-BENEFIT ANALYSIS IN REGULATION OF THE WATER INDUSTRY

Contentious issues over the correct use and evaluation of CBA have arisen in the context of statutory appeals against licensing/consenting decisions of the Environment Agency. An early instance in 1998 was an appeal by Thames Water Utilities Ltd (Thames Water) against the terms of variation of an abstraction licence.[24] These were made with a view to providing additional protection to the special ecology of the River Kennett. The Environment Agency claimed that they could be justified by CBA. Large issues arose as to the proper calculation of benefits, in particular the methodology to establish an aggregate value for WTP.[25] One stark illustration of the sort of issue that arose is the correct population to be regarded as benefiting: the Environment Agency contended for the entire population of the Thames area (some 3 million households), whilst Thames Water suggested that the maximum affected population was 100,000 and that a case could even be made for confining it to 14,000 local residents. Obviously, such differing multipliers, even with some sort of proximity weighting (or 'distance decay'), would make huge differences to the quantification of benefit, amounting to orders of magnitude.[26] The Thames Water approach was largely preferred by the inspector and followed by the Secretary of State in allowing Thames Water's appeal.

Similar issues arose in 2007 in a series of statutory appeals[27] made by United Utilities Water Plc (United Utilities) following the imposition by the Environment Agency of tightened conditions upon many discharge consents relating to United Utilities' sewerage infrastructure in the course of the AMP3 round of improvement

19 Environment Agency *Sustainable Development Series No 3* (16 December 1996, rev 1999).

20 Environment Agency *Methodology for Calculating the Overall Value of Benefits for PR04 Environment Programme* (Environment Agency 2003).

21 See HM Treasury *The Green Book* (n 5); see also HM Treasury *Accounting for Environmental Impacts: Supplementary Green Book Guidance* (The Stationery Office February 2012) and Defra *An Introductory Guide to Valuing Ecosystem Services* (Defra Publications 2007).

22 See HM Treasury *The Green Book* (n 5) Annex 2 paras 50–51.

23 ibid para 51 n 29.

24 Appeal reference: WAT/95/22.

25 All parties concerned, including central government and Ofwat, were content with the principle of the WTP method of valuation. For a cogent criticism of it in the context of this decision and an incisive analysis of the more general difficulties of measurement of benefits in the context of water quality see W Howarth, D McGillivray *Water Pollution and Water Quality Law* (Shaw and Sons 2001) para 6.14.

26 Using that expression in its usual mathematical sense ie differing exponential powers of 10; to have such differences between two respectable contentions as to the proper outcome of a supposedly quantitative process is truly remarkable.

27 Water Resources Act 1991 s 91(1)(c).

of unsatisfactory intermittent discharges as part of the National Environment Programme (NEP).[28] Three of these were determined together by a government inspector (Rupert Grantham) following a nine-day inquiry.[29] A considerable part of the inquiry was taken up with the consideration of very detailed expert evidence on CBA, since the case of United Utilities was essentially that the cost of the works rendered inevitably necessary by the tightened conditions was not merited by the incremental increase in water quality that would result; ie the work was 'not worth doing'. This contention inevitably sought to assert that there was a form of absolute valuation threshold which had not been passed in any of the three cases. The Environment Agency's primary case was that the works were effectively mandated by the need to implement the Urban Wastewater Treatment Directive and hence section 39(2) was engaged and displaced altogether any cost-benefit considerations, but were in any case defensible as a matter of discretion, including by reference to the outcome of a properly constructed CBA.

In two of the three cases, the inspector concluded that the works were mandatory in the sense explained above, so that they fell to be done regardless of the magnitude of the benefits to be enjoyed (the third appeal was allowed on rather different grounds, unrelated to the outcome of its CBA). He determined that the then relevant 1997 government guidance,[30] founded upon the requirements of the Urban Pollution Management Manual (1994 v 2) (UPM2) constituted 'best technical knowledge not entailing excessive cost' (BTKNEEC), that being the relevant standard for the purposes of the Urban Wastewater Treatment Directive. He rejected the argument that UPM2 dealt only with 'BTK' and not 'NEEC' (and thus CBA in some form was still required in every case) observing that, were that so, the guidance would be of little practical use. He concluded:

> The guidance … sets out to avoid excessive cost by encouraging least cost solutions and by recommending that the approach used to identify those solutions is the simplest of those that might be suitable, whilst acknowledging that further investigations may be required if the identified solution seems unduly costly. It does not suggest that improvements should be built only if they would achieve a particular benefit to cost ratio.
>
> These considerations lead me to conclude that the 1997 guidance, together with the UPM2, provide the appropriate framework, in England and Wales, for deciding whether sewerage systems need improvement to comply with the Urban Waste Water Treatment Regulations[31] and for determining the improvements that are required on the basis of BTKNEEC. The EA are not compelled, by law, to consent discharges in accordance with this framework. However, there would need to be truly exceptional reasons to depart from this approach and those reasons might be subject to EC scrutiny, because the framework gives expression to current government policy.

These conclusions in essence treated the question of BTKNEEC as having been predetermined by the guidance. However, having spent many enervating hours hearing evidence and cross-examination concerning CBA,[32] the inspector did express some views upon it and the limitations of the Benefits Assessment Guidance. He noted that there was an issue over whether the use of WTA rather than WTP was appropriate in the quantification of benefits, with a seven-fold difference in the outcome, and that estimates based on WTP themselves varied more than four-fold. His conclusion was:

> The evidence before me suggests that it will be some considerable time before the assessment procedures, available to the water industry, can be used to provide a robust and objective comparison of the costs and benefits, of an individual scheme, in monetary terms. As things stand, the value of such procedures is that they provide a system whereby schemes can be prioritised in an objective way. This allows government to set a BCR[33] hurdle, for discretionary elements of the NEP, that is common to all water companies and takes affordability into account when price limits are set.

That is, comparative cost-effectiveness analysis had some useful role to play but absolute CBA did not.

The same issues were visited again later in 2007 in similar appeals by United Utilities concerning improvements to the environmental performance of the sewerage system of Preston, including its impact upon bathing waters.[34] Once again, detailed economic evidence was adduced and cross-examined upon at length. With a palpable sense of relief, the inspector (David Tester) felt able to follow the reasoning of the earlier decisions and concluded that:

> As … the CSOs contribute to a failure against the mandatory standard of the Bathing Water Directive the … scheme also represents BTKNEEC. In these circumstances, United Utilities accepts that improvement is required irrespective of its cost and difficulty and no cost benefit exercise is required to be carried out because section 39(2) of the Environment Act 1995 applies.[35]

He thus confined his assessment of the lengthy economic evidence to the following:

> For this reason I have not considered the benefits of the scheme in detail, but I do believe the scheme to be part of a wider programme that would potentially benefit 4 or 5 beaches, and that the knowledge that the beach was 'clean' would benefit visitors as a whole rather than just bathers. The Estuary classification scheme, which is under review, provides a measure of the potential impact on biodiversity.

Thus, had it been appropriate, the inspector would have taken a wide view of the benefits.

Overall, the above decisions demonstrate a robustness of approach and an unwillingness to be led into the shark-infested waters of detailed numerical CBA with a view to arriving at some, perhaps illusory, absolute measure of worth.

Has anything changed since? The Economics for the Environment Consultancy stated in 2012:

28 The likelihood of precisely such challenges based upon CBA was uncannily predicted in Howarth, McGillivray *Water Pollution and Water Quality Law* (n 25) para 6.14.

29 Appeal references: APP/WQ/04/1660, APP/WQ/04/1832 and APP/WQ/04/1836.

30 DETR and Welsh Office *Guidance Note on the implementation and interpretation of the Urban Waste Water Treatment (England and Wales) Regulations 1994* (July 1997).

31 Urban Waste Water Treatment (England and Wales) Regulations 1994, which implemented the Urban Waste Water Treatment Directive.

32 Reader, I was there.

33 Benefit-cost ratio.

34 Appeal references: APP/WQ/04/1829 and APP/WQ/05/2428–33; the so-called 'Preston 7 Appeals', which failed to enjoy the same notoriety as similarly named appeals in other contexts.

35 ibid para 62.

> Studies and valuation evidence documented in the Benefits Assessment Guidance are now dated. While changes in general price levels can be accounted for, valuation methodologies have moved on, and what may have been regarded as 'leading edge' or 'good practice' in primary studies when the Benefits Assessment Guidance was produced may have been superseded by more recent developments.[36]

This suggests that there may be increasing consensus as to methodology, which may lead to increased willingness to abide by its outcome. However, one is left with the uncomfortable feeling that the exercise remains – and perhaps always will remain – one of valuing a butterfly, with a dash of admiration of the emperor's new clothes and beset by the truth of the proposition that you cannot apply a sheen to a substance whose innate consistency prevents it. The progress is quite different from that in, say, the hydraulic modelling of the performance of sewerage systems or patterns of flooding. That is a truly scientific and numerical exercise, which has steadily improved and is greatly informed by reiterative 'reality checks' – if the model does not fit the observed reality, the model is wrong and there will be good physical and/or mathematical reasons for this which can, with skill and effort, be identified and addressed by improved modelling and algorithms. With CBA there is no 'reality check'.[37] This inevitably means that the scope for purposeful manipulation of outcome is great, a consideration of which any legal practitioner presented with some superficially persuasive result of a CBA in a contentious context should be somewhat cynically aware. It also means that there is also a great need to be guided by expert advice and opinion, and the economics consultancy industry has risen to the challenge.

The exhortation to heed costs and benefits continues. One recent relevant example is in the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017.[38] Regulation 19 sets out circumstances in which it is permissible not to achieve the objectives set for a water body following modifications to the physical characteristics of surface water, alterations to the level of groundwater or new sustainable development activities. One precondition is that contained in regulation 19(4)(b):

> … the benefits to the environment and to society of achieving the environmental objectives are outweighed by the benefits of the new modifications or alterations, or of the sustainable development activities, to human health, to the maintenance of human safety, or (in the case of modifications or alterations) to sustainable development.

This expressly requires the 'weighing' of two differing and opposed kinds of benefit. Each is expressed in terms so broad as to be obviously incapable of true quantification. It must, in truth, be inviting an exercise of informed 'judgment' on the part of the decision maker, to whom 'good luck', because regulation 19(6) requires that:

> the reasons for the modifications or alterations, or for the sustainable development activities, must be set out and explained in the river basin management plan, and the environmental objectives must be reviewed every six years.

Comparing apples and oranges has never looked easier, although the enormity and potential impossibility of the task is perhaps even better expressed by the equivalent Romanian idiom of 'comparing grandmothers and machine guns'.[39]

COST-BENEFIT ANALYSIS IN PRIVATE LAW

This article has so far addressed CBA in the public law context of environmental regulation, where it has been seen to enjoy some express legislative recognition as a technique. The quotation that opens this article also opened the seminal 1977 paper by Ogus and Richardson on 'Economics and the environment'.[40] Whilst that paper makes a passing reference to the 'analysis of the costs and benefits of pollution control',[41] its subject matter, and the area in which the English lawyer was scolded for lack of application of economic principles, was not environmental regulation at all but, as the remainder of its title reveals, 'A study of private nuisance'. The thrust of the article was that principles of liability in the law of private nuisance, as well as being (very rough-and-ready) instruments of pollution control, were also (equally rough-and-ready) economic instruments and that the exercise of the discretionary power to award an injunction, or damages in lieu, was often one with significant socio-economic consequences, whether so recognised and regarded or not.

The paradigm situation is one in which the claimant or claimants is/are suffering, perhaps with many other non-parties and also the environment itself, from industrial emissions from the economically valuable and possibly almost essential activities of either a commercial or a public utility. In socio-economic terms, there is much to be considered, 'assessed', 'weighed in the balance' or 'analysed'. In that sense, courts have often been invited, with limited success, to perform a rudimentary CBA, not of any detailed or fully quantified nature, but in the name of the exercise of discretion – a function not altogether dissimilar to that required of the Environment Agency under section 39. This is still not perhaps fully recognised, as Ogus and Richardson observed.

The high point of the traditional narrow one-sidedness of the English approach is perhaps the decision of Page V-C in *Attorney-General v The Council of the Borough of Birmingham* (1858) 4 K & J 527, a significant step in the protracted litigation between Sir Charles Adderley[42] and the Birmingham Corporation over the devastation of Sir Charles's country estate on the River Tame downstream of the city as a result of the corporation's discharges of untreated sewage into the river. As the headnote colourfully

36 The Economics for the Environment Consultancy *Benefits Assessment Guidance User Guide* (The Economics for the Environment Consultancy 2012) 18.

37 How do you discover if you have in fact valued a butterfly 'correctly'? There is 'sensitivity analysis', by which the extent to which the outcome is influenced by small changes in underlying assumptions or methodology is investigated, but this realisation that choice of methodology will, more or less profoundly, influence the final numbers does not of itself tell which methodology is 'correct'.

38 Revoking and replacing the Water Environment (Water Framework Directive) (England and Wales) Regulations 2003.

39 *baba şi mitraliera*; see also Wikipedia *Apples and Oranges*, which entry most pertinently contains a link to an April Fools Day article 'Comparing apples with oranges: a fruity look at unrelated variables' *The Economist* (1 April 2014) www.economist.com/blogs/graphicdetail/2014/04/daily-chart, which contains the jocular proposition that: 'Nothing rankles data mavens more than analysing two things that ought not be compared'. If the cap fits …

40 See Ogus, Richardson 'Economics and the environment' (n 2) 284.

41 ibid 318.

42 On the relation of the Attorney-General.

records, an injunction was granted by application of the following principles:

> Public works ordered by Act of Parliament must be so executed as not to interfere with the private rights of individuals; and in deciding on the right of a single proprietor to an injunction to restrain such interference, the circumstance that a vast population will suffer (e.g., by remaining undrained), unless his rights are invaded, is one which this Court cannot take into consideration.

The actual words of Page V-C were no less colourful or trenchant:[43]

> Now, with regard to the question of the Plaintiffs right to an injunction, it appears to me that, so far as this Court is concerned, it is a matter of almost absolute indifference whether the decision will affect a population of 25,000,[44] or a single individual carrying on a manufactory for his own benefit. The rights of the Plaintiff must be measured precisely as they have been left by the Legislature. I am not sitting here as a committee for public safety, armed with arbitrary power to prevent what, it is said, will be a great injury not to Birmingham only, but to the whole of England; that is not my function.[45]

This complete abnegation of not only CBA (unsurprisingly, it having not been devised as a technique by then) but also of the need to have any regard whatsoever to costs and benefits must certainly have made life simple for advisers, but rather difficult for public body tortfeasors. It was to some extent ameliorated in the instant case by the prolonged suspension of the injunction,[46] a pragmatic result arrived at in numerous subsequent cases.[47]

In the very same year the passing of the Chancery Amendment Act (Lord Cairns' Act) gave to the courts of Chancery the jurisdiction to award damages in lieu of an injunction; however, the circumstances in which that was considered appropriate were very significantly circumscribed in 1895 in the case of *Shelfer v City of London Electric Lighting Co*,[48] another private nuisance case against a public body. They were defined by A L Smith LJ in the Court of Appeal as follows:

> (1) If the injury to the plaintiff's legal rights is small,
> (2) and is one which is capable of being estimated in money,
> (3) and is one which can be adequately compensated by a small money payment,
> (4) and the case is one in which it would be oppressive to the defendant to grant an injunction: then damages in substitution for an injunction may be given.[49]

This might be credited with the introduction of some notion of regard being had to costs ('it would be oppressive to the defendant') and benefits ('the injury to the plaintiff's legal rights is small'). However, this is still only by reference to the position of the immediate parties, so of very narrow scope. In *Shelfer* itself, the plea of the defendant that 'the Court, on the materials before it, ought not to grant an injunction to restrain a work which is for the benefit of the whole City of London, in which many of the main streets and public buildings would be left in darkness if the company's works were stopped' found favour with Kekewich J at first instance but fell on deaf ears in the Court of Appeal, which granted the injunction sought. Lord Halsbury did at least recognise that the issue could be expressed in economic terms, but was not persuaded by such an analysis:

> … the effect of such a refusal in a case like the present would necessarily operate to enable a company who could afford it to drive a neighbouring proprietor to sell, whether he would or no, by continuing a nuisance, and simply paying damages for its continuance.[50]

Lindley LJ similarly observed:

> Courts of Justice are not like Parliament, which considers whether proposed works will be so beneficial to the public as to justify exceptional legislation, and the deprivation of people of their rights with or without compensation.[51]

This disdain for a form of unbridled private right of compulsory purchase prevailed for nearly 100 years and, as a matter of human instinct, perhaps still does. Nevertheless, the *Shelfer* principles have proved very restrictive in practice and certainly difficult to square with any disposition to recognise the wider social and economic consequences of nuisance litigation and to tailor the outcome accordingly. The start of the judicial change of heart is usually seen as being the decision in *Miller v Jackson*,[52] in which the Court of Appeal[53] refused to restrain the long-standing playing of cricket on a field next to some newly built houses, which suffered from the consequences of the batsmen's greatest successes. This change of heart was noted and welcomed by Stephen Tromans (now Stephen Tromans QC) in his very perspicacious and far-sighted 1982 article 'Nuisance: prevention or payment?',[54] which considered modern academic analysis of the socio-economic function of nuisance litigation and suggested that 'the time is now ripe for a fundamental review of the rule in *Shelfer*'s case'.

A degree of review has now (only 32 years later) taken place, the law if anything having rather regressed in the meantime.[55] In *Coventry v Lawrence*[56] in the Supreme Court, in the context of a claim to restrain nuisance by noise, Lord Neuberger PSC took the opportunity to perform it. He encouraged a much more flexible approach to the award of damages in lieu and also recognised 'the unsatisfactory way in which it seems that the public

43 Although the prize for such language must go to counsel for the Birmingham Corporation: 'If the drains are stopped, as prayed by the bill, the entire sewage of the town will overflow. Birmingham will be converted into one vast cesspool, which in the course of nature … must empty itself into the Tame as before, only in a far more aggravated manner. The deluge of filth will cause a plague …'; 4 K & J 527, 536.

44 *sic*; the actual population was approximately 250,000, but, as pointed out above, a single order of magnitude can in any case count for little even if a CBA is performed.

45 (1858) 4 K & J 527.

46 The entire saga is very informatively recounted in both B Pontin *Nuisance Law and Environmental Protection: An Analysis of the Enforcement of Injunctions* (Lawtext Publishing 2013) and L Rosenthal *The River Pollution Dilemma in Victorian England: Nuisance Law Versus Economic Efficiency* (Ashgate Publishing 2014).

47 A good example is *Stollmeyer v Petroleum Development Co Ltd* [1918] AC 498, which concerned a nuisance to riparian interests caused by the operation of an oil field; the Privy Council felt compelled to grant an injunction, but suspended it because: 'The loss to the respondents would be out of all proportion to the appellant's gain …' 499–500 (Lord Sumner).

48 [1895] 1 Ch 287.

49 ibid 322–23.

50 [1895] 1 Ch 287, 311.

51 [1895] 1 Ch 287, 309.

52 [1977] QB 966.

53 Almost inevitably a bench presided over by Lord Denning MR, at the height of his powers and reformatory zeal.

54 S Tromans 'Nuisance: prevention or payment?' (1982) 41(1) *Cambridge Law Journal* 87.

55 See eg *Watson v Croft Promo-Sport Ltd* [2009] 3 All ER 249.

56 [2014] AC 822.

interest is to be taken into account when considering the issue whether to grant an injunction or award damages. The notion that it can be relevant where the damages are minimal, but not otherwise … seems very strange'.[57] Thus:

> I find it hard to see how there could be any circumstances in which *[the public interest]* arose and could not, as a matter of law, be a relevant factor. Of course, it is very easy to think of circumstances in which it might arise but did not begin to justify the court refusing, or, as the case may be, deciding, to award an injunction if it was otherwise minded to do so. But that is not the point. The fact that a defendant's business may have to shut down if an injunction is granted should, it seems to me, obviously be a relevant fact, and it is hard to see why relevance should not extend to the fact that a number of the defendant's employees would lose their livelihood, although in many cases that may well not be sufficient to justify the refusal of an injunction. Equally, I do not see why the court should not be entitled to have regard to the fact that many other neighbours in addition to the claimant are badly affected by the nuisance as a factor in favour of granting an injunction.[58]

This view found favour with the other justices, but Lord Sumption JSC adopted a rather different approach. He considered 'the public interest' to be too wide and vague a concept in itself and tentatively posited its expression in the outcome of the planning process as a surer guide:

> In my view, the decision in *Shelfer* is out of date, and it is unfortunate that it has been followed so recently and so slavishly. It was devised for a time in which England was much less crowded, when comparatively few people owned property, when conservation was only beginning to be a public issue and when there was no general system of statutory development control. The whole jurisprudence in this area will need to be reviewed one day in this court. There is much to be said for the view that damages are ordinarily an adequate remedy for nuisance and that an injunction should not usually be granted in a case where it is likely that conflicting interests are engaged other than the parties' interests. In particular, it may well be that an injunction should not be granted as a matter of principle in a case where a use of land to which objection is taken requires and has received planning permission.[59]

Lord Sumption cited with approval in this context a passage from the dissenting judgment of Millett LJ in *Co-operative Insurance Society Ltd v Argyll Stores (Holdings) Ltd*,[60] a case concerning the enforceability of a 'keep open for trading' covenant in a commercial lease:

> Sir Edward Coke resented the existence of an equitable jurisdiction[61] which deprived the defendant of what he regarded as a fundamental freedom to elect whether to carry out his promise or to pay damages for the breach. Modern economic theory supports Sir Edward Coke; an award of damages reflects normal commercial expectations and ensures a more efficient allocation of scarce economic resources. The defendant will break his contract only if it pays him to do so after taking the payment of damages into account; the plaintiff will be fully compensated in damages; and both parties will be free to allocate their resources elsewhere.[62]

This approach is consistent with the economic theory underpinning CBA, but confines the scope of the inquiry to the immediate parties. If what the defendant is doing through his activities is killing all the claimant's butterflies, then he is perfectly entitled to do so provided he pays their value to the claimant. Millett LJ's formulation, if removed from its actual commercial, contractual context and applied to the tort of nuisance in an environmental context, would appear, by its narrow focus upon compensation of the claimant's interests alone, to ignore all externalities. It would confine the court's attention to the market price of the butterflies, rather than any wider ecological value that they might possess. The approach proposed by Lord Sumption is actually expressed in much wider terms, given his reference to circumstances 'where it is likely that conflicting interests are engaged other than the parties' interests'. There is indeed much need for further, comprehensive review and the Supreme Court has signalled its receptiveness to the debate.

It may be that in cases involving injury to the environment the best approach is the same as that in section 39 of the Environment Act 1995, ie that in deciding whether or not to grant an injunction the court should, unless and to the extent that it is unreasonable for it to do so in the circumstances of the particular case, take into account the likely costs and benefits of the exercise or non-exercise of the power or its exercise in the manner in question, including the impact upon the environment. Would it be better applied in practice if the court was assisted by structured CBA, which seems not to be required in the application of section 39? It seems doubtful. The balancing exercise will surely continue to be regarded as inherently discretionary, and thus reviewable only in circumstances of egregious error (by the application of principles not dissimilar to those used in judicial review).

IN CONCLUSION

The above has just scratched at the surface of the questions raised by the use of CBA in environmental law. The technique seems to have failed to gain traction; in its 2016 paper,[63] the OECD concluded:

> 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.

57 ibid 854 at 118, a reference to the decision of the Court of Appeal in *Watson v Croft Promo-Sport Ltd* (n 55).
58 [2014] AC 822, 856 at 124.
59 ibid 864 at 161.
60 [1996] Ch 284. The appeal to the House of Lords was allowed on a rather different basis; see [1998] AC 1.
61 ie the jurisdiction to grant an injunction.
62 [1996] Ch 284, 304.
63 OECD *Cost-Benefit Analysis and the Environment: Recent Developments* (n 6).

The challenge that CBA faces, in the context of either environmental regulation or private nuisance claims, is demonstrating (as the above passage seeks to suggest) that it is in fact a superior basis for decision making to the exercise of discretionary judgment by the decision maker, or even that it contributes usefully to that latter process. The *identification* of wider costs and benefits is obviously fundamental to proper decision making, but whether their attempted *quantification* is really of use, save as a means of ranking competing approaches, remains far from clearly demonstrated or accepted at the coalface of litigation. There is a real concern that to be required to follow slavishly the results of a sophisticated CBA would force a decision maker, government inspector or judge to be that someone 'who knows the price of everything and the value of nothing'.[64] Or might the exercise of a broad discretion or judgment be instead the act of someone 'who sees an absurd value in everything and doesn't know the market price of any single thing'?[65]

64 With apologies to Oscar Wilde and his character Lord Darlington in *Lady Windermere's Fan*, defining a cynic, in response to a request from his acquaintance Cecil Graham.

65 ibid, according to Cecil Graham, defining by way of riposte a 'sentimentalist'.