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Valuation of unpriced products: contingent valuation, cost–benefit analysis and participatory democracy

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Abstract

Cost–benefit analysis seeks to measure 'full value' of forests. Its willingness to pay measure has been criticised, particularly when elicited by contingent valuation. This method certainly has faults, eliciting inconsistent, symbolic and citizen values, and sensitive to elicitation method. However, these problems also affect democratic procedures; and such methods arguably overweight short-term *processes*. Many other techniques exist for bringing 'full value' into cost–benefit analysis: measuring downstream production for physical products; deducing psychic values from indirect market data. Questionnaire methods are best transmuted to compare similar entities and combined with other evaluative tools.

Keywords: Cost–benefit analysis; Contingent valuation; Democracy

Introduction

Full value of forests to society is far from being a new concept to economists. Its key evaluative methodology, cost–benefit analysis, originates in the 19th century (Dupuit, 1844; Pingle, 1978). Since then cost–benefit analysts have continually sought evaluation of "all goods and services, whether marketed or not, to whomsoever accruing...". Even before the forestry cost–benefit analysis of 1972 (Treasury, 1972; Price, 1997a), UK economists had attempted to value many effects of forestry. Meanwhile, world-wide, forest economists have led efforts to improve valuation methods. 'Total economic value' and 'extended cost–benefit analysis' are terms added to the *jargon* in recent years, but they add nothing *conceptual* to what was already being done.

Unbiased and focused evaluation of unpriced benefits is an important pre-condition for needed policy interventions, as discussed elsewhere in this volume (e.g. Glück, 2000). Otherwise, they may degenerate into partisan advocacy of forestry for its contribution to 'apple-pie and parenthood' – or rather to those other self-evidently good things, sustainability and multipurpose forest management. Economists should not be asked to uphold, quantitatively, newly fashionable justifications for forestry: rather their role is to evaluate *to what extent* forestry is justified, given all its effects – bad effects as well as good ones. Even if foresters choose to ignore them, unpriced costs do exist – reduced river flow and disrupted traditional landscape, for example. Impartial economists should evaluate these too (irrespective of who funds the cost–benefit analysis).

The question – once asked rhetorically, but taken seriously now – is, *how*? The basic evaluation problems are those of aggregating dissimilar entities.

- how to compare different ranges within a *given* scale (for example, does the difference between "attractive" and "excellent" landscape have the same importance as that between "undistinguished" and "pleasant" landscape?);
- how to measure scales for different types of value against each other;
- how to combine the viewpoints of different stakeholders;
- how to assemble values in different periods of time;
- how to include different scenarios, where the future is uncertain.

Cost–benefit analysis is clear on how it tackles these aggregation problems: it does so by summation of

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willingness to pay for good things, minus summed willingness to accept compensation for bad things.

This willingness to pay measure is at once the strength and the weakness of cost–benefit analysis: its strength because at a stroke it solves all aggregation problems by mapping everything onto a common scale of value; its weakness because that common scale has connotations inviting informed and ignorant abuse. ("Bringing to the lowest common denominator" is a term widely (though erroneously) used pejoratively, to imply adoption of the lowest ethical standard.)

This paper examines the weaknesses of willingness to pay, focusing on contingent valuation. It shows, however, that these problems are even more troublesome in democratic means of aggregation. It reviews other, perhaps more reliable, methods of assessing willingness to pay.

Contingent valuation: a tyrant of our age?

Over the past 10 years, the contingent valuation method (CVM) has become dominant in valuing environmental and other goods. Its philosophy fits the fashionable participatory approach to decision making. If you want to know what something is worth, go to those who might value it and ask: "what are you willing to pay for it?" Or, should it be a bad thing, "what compensation would you accept, for tolerating it?" The responses can be dropped directly into the feed-hopper of the cost–benefit analysis mill.

Beguilingly straightforward though it appears, however, this technique more than any other has generated fierce debate: and, so closely has cost–benefit analysis been identified with it, that the broader methodology has been undermined by criticisms of the individual technique.

The controversy about CVM arises because it embodies two assumptions made by cost–benefit analysis about *utility maximisation* (a term which could be translated as "making everyone as happy as possible"):

1. maximisation of aggregate utility *to* everyone, *from* all products, *in* all time periods, *under* all scenarios is the appropriate goal for decision making;
2. more is preferred to less personal utility when individual choices are made (people act as utility maximisers).

To these might be added a third assumption, specific to CVM:

3. responses to CVM questions reflect the amount which *if actually paid in exchange for the product* would leave individuals' utility unchanged (Randall, 1994).

The first assertion raises a philosophical issue. Despite reference to "... life, liberty and the pursuit of happiness" in the American Declaration of Independence, many would argue that such pursuit is an unworthy and even self-defeating objective. That viewpoint, however, is no critique of cost–benefit analysis. The methodology does not focus on motivations of decisions, but on their outcomes. If people are happy as a *result* of decisions, then that satisfactory outcome is what cost–benefit analysis attempts to predict and favour. It is hard to see the merit of a methodology systematically favouring outcomes under which people were *less* happy than they might otherwise have been.

Cost–benefit analysis is on more difficult ground with its second assumption, concerning the preferences of respondents. Sagoff (1988) argues that individuals do not choose solely for their selfish benefit as consumers: they act politically as citizens, making choices in which wider well-being is an argument. Willingness to pay questions elicit bids incorporating perceived value to the community, not merely the respondent. Moreover, individuals may have 'lexicographic preferences': that is, satisfaction of one set of values (often those with ethical content) is always preferred over satisfaction of another (often material and monetary ones): there is no trading between the two. Thus, willingness to pay questionnaires involving environment or justice engender protest responses – refusal to answer, or registration of zero or infinite willingness to pay.

The third assumption, about value equivalence between products and cash, raises questions like the following.

- Do respondents imagine the same unpriced product as questioners think they are offering?
- Is the scenario suggested for paying for the product believable?
- Are there incentives for respondents to answer truthfully?

A vast literature addresses many other technical problems and biases, but these are passed over in the following discussion.

Take two contrasting examples of contingent valuation.

In a survey of a peri-urban wood, visitors were asked how far they would be willing to drive for recreation if that wood became unavailable (Price, 1971). Questioner and respondent were communicating about a product familiar to both parties; the payment scenario was realistic – if housing development occurred, they really would have to drive further afield for recreational benefits; it was not clear whether the respondents' interest was to exaggerate value (increasing the wood's valuation as a recreation resource) or understate it (reducing the entry charge, should access arrangements change).

Elsewhere, when respondents were asked how much they would theoretically pay to preserve a bird they had not heard about, whose ecological function they did not know, living in a wetland they had never visited, the

question naturally arose: how competent – given their inexperience and the novel situation – were respondents to answer meaningfully (Price, 1999a)? People are not accustomed to weighing cash against an ill-defined cluster of values, which includes the following components: instrumental (what good does the bird do?), aesthetic (how nice does it look?) and intrinsic (what pleasure does the bird get from life?).

Answering a question that nobody asked

The problems were clarified by a casual survey of University of Wales students. (Evidently, this sample was too small and biased to yield a fair valuation: it intended merely to illustrate problems.) Respondents were asked their willingness to pay to ensure conservation of one forest-based species, *Rafflesia arnoldii*. No information about the species was given. Individual willingness to pay ranged between 50p and £20.

Next, respondents were informed that *Rafflesia* is a parasitic plant, with the largest flower in the world, it smells of rotting flesh to attract insect pollinators, and grows in South-east Asia. As usual, information increased willingness to pay of some respondents (Samples et al., 1986; Hanley and Craig, 1991). Most respondents, however, either maintained their willingness to pay or even reduced it, probably because they had expected *Rafflesia* to be a large mammal or attractive bird, and were disappointed that it was "only" a flower, or perhaps the bad smell made it seem less worthy of payment.

Respondents were also asked to tick the statements best describing the reasons for the value given (some respondents gave more than one reason) (Table 1).

Finally, they were asked whether they had known of this species, by this name, previously. Statements were verified (or refuted) from their (speculative) descriptions of the species, made before information was given. Evidently, only a small minority really had known anything about *Rafflesia*.

Table 1
Reasons for passive use value

Reason for giving this value	Number of responses
1 I knew about the importance of this species	2
2 I suspected that this species does not really exist	6
3 I believe that genetic resources should be maintained intact	9
4 I want to be seen as someone who is concerned about nature conservation	2
5 I thought you would not have asked these questions if it was not important	4
6 I did not know anything about it	13

This exemplifies a widespread problem: respondents may treat a particular species as symbolic of wider environmental values (Blamey, 1996). When the entities to be preserved are increased manyfold within one questionnaire, willingness to pay increases by only a small factor (Kahneman and Knetsch, 1992). Some respondents were willing to pay for *Rafflesia*'s preservation, although they did not believe in its existence! Paying for a product that does not exist cannot maximise utility in any ordinary sense: most plausibly, the species attracted a symbolic payment for conservation generally. Nine respondents believed that genetic resources should be maintained intact. Yet no agency can deliver that outcome. Even if *Rafflesia*'s survival could be guaranteed, there is no possibility that *all* genetic resources will remain. If willingness to pay for intactness is genuine, it should be spread over all threatened species, not annexed exclusively by *Rafflesia*.

Questions like this routinely tap the same reservoir of symbolic value, ascribing it to whichever species is investigated. This association is transient however: we can only be concerned about a few conservation issues at one time, and raising a new issue makes us less mindful of earlier-considered issues (Price, 1999a). If stated willingness to pay suffices to "fund" successful preservation of one species, that same symbolic value can be transferred to other species and habitats. But suppose that *Rafflesia* did become extinct: there would still be another species with the largest flower in the world, to which *Rafflesia*'s value would be transferred. Its niche would be occupied by other individuals. Perhaps nothing much would have changed.

Moreover, if arithmetic procedures are applied to a sequence of composite valuations, the value attributed to components depends on the order of evaluation. For example, Macmillan (1999) found that the £51 value given for creation of one native pine-wood was reduced to £35 when willingness to pay for *all other* such woods was explicitly debarred. Superficial interpretation suggests that the value of "all other such woods" must be £16. Yet if any *one* of those woods had been evaluated individually, it too might have attracted a value of £51 initially and £35 subsequently.

Willingness to pay may also quantify respondent's self-esteem rather than the species being valued: two respondents mainly wished to be seen as people "concerned about nature conservation". Declaring positive willingness to pay gave "moral satisfaction" (Kahneman and Knetsch, 1992), but this benefit does not depend on any particular species being preserved.

When the questionnaire's object is a habitat for higher animals, willingness to pay may embody altruistic desire to act in the creatures' interest. Among respondents to an earlier questionnaire (Price, 1999a), 25% of willingness to pay was attributed to these 'intrinsic values'. Yet such responses misunderstand intrinsic value. Can humans

really imagine how greenshank (*Tringa nebularia*) feel about life in a peaty wetland? Intrinsic values have ethical weight, but how humans feel about them is a different kind of value, again expressing desire to be [seen to be] acting responsibly towards nature.

Thus, from several viewpoints questionnaires answer questions which nobody intended to ask. They elicit willingness to pay, from the group questioned, which is only remotely related to the utility retained if *Rafflesia* or *Tringa* were preserved from extinction. The process of elicitation may be as important as the object preserved in determining willingness to pay.

CVM and aggregation

The relationship between willingness to pay and utility change becomes even more tenuous when questionnaire responses are scaled up from the sample to the whole human population. Of this population, only a small proportion (assuming those questioned were representative) would know of *Rafflesia* or *Tringa*, or would be aware if either became extinct. For that small proportion only, the appropriate willingness to pay is that existing *before the interviewer gave information*. Information may make *respondents* willing to pay more for conservation, but it does not affect the vast majority of people, who were not interviewed, and who therefore received no extra information. Even if the sample received no information, willingness to pay would be biased simply because a questionnaire was applied – four people thought that "you would not have asked these questions if [this species] wasn't important".

Much less so is the questionnaire response appropriate to those ignorant of the object of conservation interest. In order that the third condition about utility maximisation can be met, one's well-being must not be changed by paying, in cash, the derived contingent valuation in exchange for preservation of *Rafflesia* or *Tringa*. It seems implausible to argue that well-being is unchanged if

- one did not know that this species existed;
- one was unaware that it had *not* been made extinct;
- money is taken from one, without one being told why.

A further critique of willingness to pay is that it aggregates willingness to pay of rich and poor, raising the question: are there conflicts between aesthetic values to the rich and material production accruing to the poor whose willingness to pay is seriously constrained by ability to pay, regardless of the importance of products in their lives?

Aggregation requires comparison not only of different products and stakeholder groups, but also of values accruing at different times. Traditionally, cost–benefit analysis has accomplished this by discounting[1] future costs and benefits at a rate derived from the financial return on investment. The underlying assumption – that the value of all products *can be* and *actually is* transformed through time by financial investment – has been heavily criticised in application to both environmental and material products (Price, 1993). Why should anyone's willingness to pay for beauty or biodiversity change through time in a way related to bank rates? Thus, discount rates have increasingly been derived from people's choices between quanta of products at different times, or implicit willingness to pay for immediate consumption in terms of greater future consumption forgone thereby.

These CVM-like approaches have found discounting processes remarkably different from those assumed in traditional cost–benefit analysis or revealed by financial markets. People adopt high discount rates over short time periods, when choosing between rather trivial things, when making private choices: but over long periods, for important things, and in a public choice context, the discount rate is much lower. Thus, rates derived in consumer choices of the first kind are inappropriate for discounting in long-term public decisions.

CVM or what else?

Added to these doubts about CVM values, are further criticisms of utility-maximisation assumptions, stemming from the paradoxes of Allais (1953), later developed under the title of "prospect theory" (Thaler, 1980; Kahneman and Tversky, 1982). These have many formats (Price, 1999b), but their essence is that *processes* and *contexts* of decision making may be as important as actual *outcomes* of decisions, in determining people's choices, and that preferences between outcomes may change between different contexts. Since cost–benefit analysis judges utility of outcomes from choices (e.g. willingness to pay for products) utilities derived

- include things other than outcome values,
- exclude factors relevant in different decision contexts.

To collect critiques of the utility-maximisation model embedded in CVM and cost–benefit analysis:

- Decision processes, as well as outcomes, affect preferences between alternatives.
- Ability to pay as well as utility determines willingness to pay.

[1] Discounting is the process of giving an equivalent present value for some future product: it is invariably done in such a way as to reduce the significance of products generated in the future.

- In valuing the future, standard discounting gives unreliable indications of what options maximise individuals' utility.
- Some values are considered "untradable".
- One cannot know the mind of other entities: for example, in valuing the intrinsic component of conservation, willingness to pay cannot properly represent creatures' own view.
- In public affairs people do not act as selfish consumers, but as citizens defending the public interest.
- Some expressed values for individual entities symbolise values for a whole class of entities.

Does all this imply that we should abandon cost–benefit analysis in favour of other forms of decision making, for example through deliberative democracy, through referendum, or through expert appraisal by scientists? By no means!

Utility maximisation: a good thing for outcome bearers

The first argument is this. Sagoff (1988), Jacobs (1997) and proponents of prospect theory argue that process and context are important in decision making (even at the expense of optimal utility outcomes which concern cost–benefit analysis). Therefore, utility maximisation is a bad model of actual decision making. The premise is agreed, but the obverse conclusion might be drawn: actual decision making is a bad way of maximising utility.

Arguably, in the long term, and for most people, utility outcomes are what matter. In CVM, all people are not represented by questionnaire respondents who become, by their extraordinary involvement in the process, atypical. Similarly, the vast majority of people affected by many land-use decisions take no conscious part in constructing a decision, so derive no benefit from these dynamics. Moreover, process and context lie in the present time of active decision constructors while decisions are being made: responding to these makes decision constructors feel good about themselves. They are, for example, likely to be attracted by options with high-profile symbolic content, and to avoid good long-term alternatives where short-term risk may cause them anxiety. The feeling of this present time is given extraordinary weight by the irregular discounting procedures alluded to above. But when time moves on, and actual outcomes lie in the present, these will be judged more important than processes that delivered them.

From this viewpoint, public agencies actually ought to assist maximisation of utility to the aggregate of individuals, even if individuals themselves appear not to maximise utility.

If critiques of CVM, then more so of democratic processes

A second counter-critique runs as follows: the reasons causing CVM incorrectly to assess what would genuinely maximise individuals' utility, may cause alternative decision processes to give an even less correct account. These causes are detailed below.

For example, among scientists the notion of 'scientific decision making' is fraught with assaults on cherished ideas. The Sagoffian critique of CVM, that respondents are unwilling to trade values of different kinds, resonates with a fundamental credo of scientists, who are notorious for insistence that "you can't add apples and elephants". The problem is that, in the real world of forest decisions, apples – which might stand for non-timber forest products – and elephants – which might symbolise macrofauna biodiversity – are sometimes in conflict: their values must be traded, and this requires unpalatable comparisons.

The kind of measurements suggested by Larsson (undated) for biodiversity and by Hunziker and Kienast (1999) for landscape assist comparisons. But even within different ranges of the individual scales arithmetic has doubtful validity. Much less can biodiversity and landscape scales be traded against each other when they conflict. Such values inform the political process, but ultimately a trade-off is made by politicians (who may have no better idea than anyone else whether a single red-book species is worth more than the best view in Europe).

Alternatively, these difficult trade-offs may engage a wider constituency. Yet referenda also raise aggregation problems. Despite individual lexicographic preferences, a majority of people with weak preferences always defeats a minority with strong preferences. Moreover, the order in which options are introduced may change the outcome of a referendum. Consider the following options, presented to an electorate including approximately equal numbers of individuals with single objectives: aesthetes, conservationists, and edaphologists.

- Option A offers excellent landscape, moderate biodiversity, and high erosion.
- Option B offers spoiled landscape, maximum biodiversity, and moderate erosion.
- Option C offers pleasant landscape, little biodiversity, and no erosion.

If A and B are compared, conservationists and hydrologists outvote aesthetes, preferring B by a two-to-one majority. However, if B and C are compared, a two-to-one majority of aesthetes and hydrologists over conservationists prefer C. Finally, comparing C and A, aesthetes and conservationists outvote hydrologists, and A is selected.

So what of the participatory democracy favoured by many opponents of CVM?

Lexicographic political preferences lead to refusal to trade money against environmental, social or ethical values in CVM. They also become manifest in refusal to

negotiate. The idealised sweet reasonableness of participatory discussion is not always found in real-world debate, where decisions may favour not the most deserving, but the most obstinate.

As willingness to pay is skewed by ability to pay rather than welfare, so the outcome of discussion may be skewed by freedom to participate and ability to articulate rather than need. As wealth and effective political involvement are not uncorrelated, perhaps the result of both decision processes will be similar.

Acting appropriately as a citizen, on behalf of society, as Sagoff asserts that people do, is no easy requirement. To give due weight in representing one viewpoint against another, I must know how many people share my view, and how strongly they hold it. Yet how do I understand the importance to other people of values of no direct significance to me? The problem may be less than that of "knowing the mind of *Tringa nebularia*". But, through the screens of language, culture and temperament, to what extent does "I feel passionate about this!" mean the same thing when spoken by Europeans from Mediterranean and from Nordic regions? Does the Nordic temperament *feel* less, or merely *reveal* less? With the best will in the world, to weigh these matters in a democratic forum is problematic.

Finally, symbolic factors, which seriously distort CVMs, also haunt the political arena. In participatory debate terms like 'sustainability' and 'multipurpose forestry' symbolise identification with 'right values' and 'responsible thinking', appropriate to a selfless citizen acting for the common good, *but also attractive to any citizen who desires to be well-considered*. In a democratic forum one could hardly advocate unsustainability or single-purpose forestry. But one decision favouring sustainability does not ensure sustainability of the world's production: indeed, sustainability constraints on timber production in one region may undermine sustainability elsewhere (Sedjo, 1996). Moreover, sustainability applies as logically to continuing flow of bad things as of good: but do we advocate land uses offering sustainable deprivation? Nor need multipurpose forestry on every site most effectively meet the various needs of various communities. Here symbolic words and delusory 'right sentiments' displace valuation of actual outcomes: letting decision constructors feel good about the process again penalises the outcome bearers.

Alternative evaluation techniques

If critiques of the cost–benefit analysis model of utility maximisation become *even stronger* critiques of alternative decision making methods, how can one proceed? Perhaps one should re-examine the capabilities of cost–benefit analysis: it embraces many techniques with a longer and more successful history of application than CVM.

For example, the constraining force of ability to pay on willingness to pay is allowed for in social cost–benefit analysis by weighting willingness to pay inversely according to income. The same process mediates valuation of future outcomes, discounting of non-market products being justified only if future generations' income is expected to bring greater consumption and hence less scarcity value (Price, 1993).

In valuing unpriced products, many alternatives to CVM exist, according to category of product. These are both more 'natural', and less prone CVM's problems.

Material outcomes

CVM has become so popular in environmental economics, that there is a tendency to "reach for the questionnaire", even when willingness to pay is already quantified through mechanisms in which money is actually spent to gain advantage, or saved by pursuing a particular land use.

- Why ask a sample of Swiss residents "What would you be willing to pay to live in a country free of avalanches?"? Although avalanches themselves are unpriced, their financial consequences are only too apparent. Seymour and Girardet (1986) estimated the cost of adopting engineering solutions to replace the avalanche-protective functions of Switzerland's forest as approximately 300 000 million euros.
- Why ask British people "What compensation would you require for loss of hydroelectricity generation caused by afforesting this catchment?" The compensating payment can readily be calculated, as the additional fuel cost at thermal power stations which replace the lost capacity (Barrow et al., 1986).
- Even in such arcane areas as carbon cycling and its impact on global warming, respondents to CVM studies were prepared to offer their inexpert valuations (Price, 1999a). They did not find it absurd, being asked their willingness to pay for the ecological functions of a complex peatland ecosystem. Politicians show no signs of understanding the implications of a policy to stabilise atmospheric CO_2 (Price, 1997b): should we expect their constituents to know better, and to know better than the hundreds of scientists who devote themselves to evaluating this problem? Outcomes for individuals, in terms of goods and services lost through climate change, are best evaluated via actual willingness to pay for such lost (and expertly quantified) products.
- Perhaps the absurdest thing is to invent a problem, by treating a directly priced product as though unpriced. Peck and Ottitsch (2000) properly remind us that full value of forests includes timber. Why interpret people's willingness to pay for different silvicultural systems as an appropriate value for the process of timber

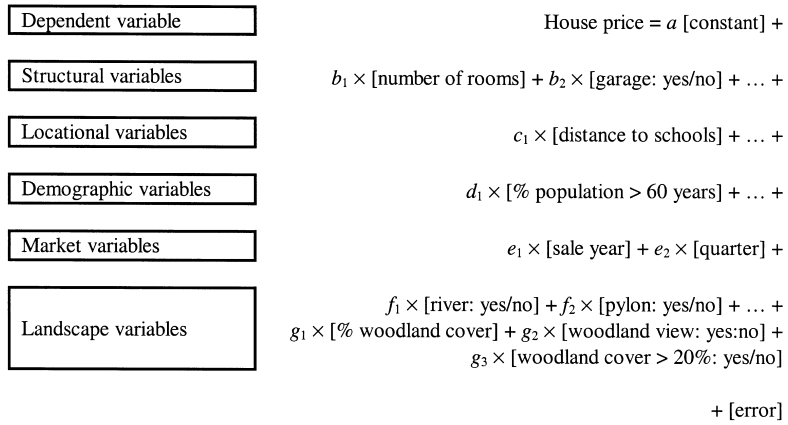


Fig. 1. An hedonic house price model.

production? People do pay for timber *products*, and this, for the vast majority of outcome bearers (timber consumers) values timber appropriately. And yet CVM has been interpreted as giving a relevant basis for trade-off between conflicting forest functions (Environmental Resources Management, 1996).

Aesthetic outcomes

Beautiful views cannot usually be marketed by those whose properties constitute the view. But people do actually pay to gain good views, in the cost of travelling to see such views, or in premia for houses commanding them.

This approach to environmental evaluation – the hedonic pricing method – is perhaps second in fashionability to CVM. A model of factors believed to influence house prices is formed, as in Fig. 1.

Data from many transactions for houses of known characteristics are fed into a multiple regression, from which values for coefficients such as g_1 are interpreted as willingness to pay for a 1% increase in woodland cover near a house.

Hedonic pricing is attractive in its direct appeal to consumers who are

- taking decisions in pursuit of their own interests,
- in a situation generally untrammelled by a desire to express "right values" in public, and
- where they are the best judges of their own interest.

But surprising results emerged from recent applications to trees and forestry: the nearer it was to a forested park, the lower the house's price (Tyrväinen, 1999); young spruce trees near houses did not affect value, but spruce trees older than 50 years reduced house prices (Willis and Garrod, 1992); having woodland *in the vicinity* had the opposite price effect from having woodland *in the view* (Garrod and Willis, 1992).

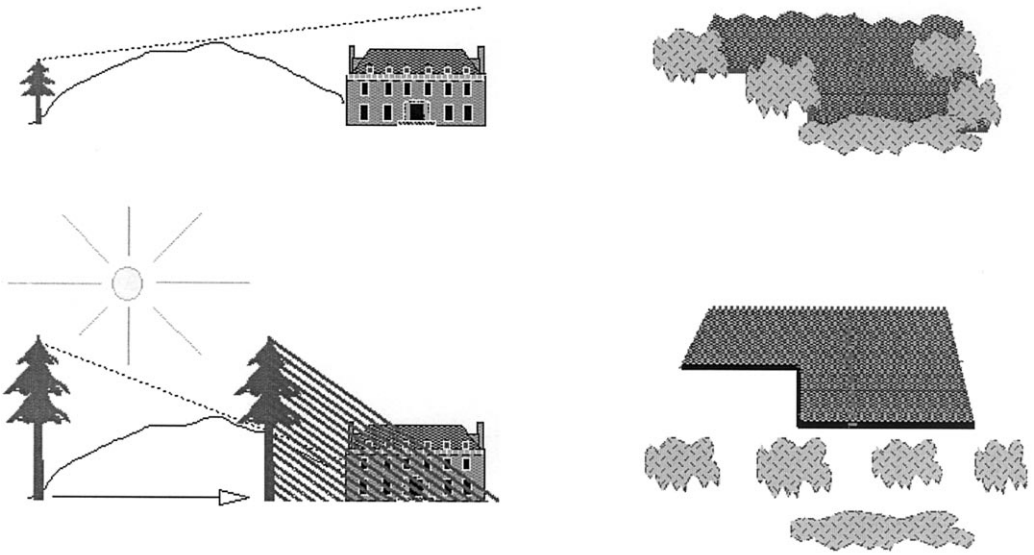
Entirely reasonable explanations can be given (see Fig. 2). For example, in northerly latitudes, nearby park trees reduce the brief period of winter sun still further (Tyrväinen, 1999). Young spruce trees in the vicinity might not adversely affect the view because screened by intervening topography, or because planted in an era of greater awareness of aesthetic design). But these accounts *are* interpretations, adding human mediation to computers' mechanical data processing. Profound errors would ensue from policy prescriptions based on blind acceptance of computers' 'valuations' – such as banishing all trees to beyond the city fringe, or felling spruce trees at 50 years old.

Equally important is the atomistic nature of hedonic pricing. Landscape features are assumed to affect beauty in some simple quantitative way. And yet it is often composition of features, rather than their quantitative presence, that creates high quality: arrangement of tree blocks and subtleties of line differentiate the aesthetic quality of treatments (Fig. 2b). Yet the number of possible quantitative models expressing interaction is such, that their systematic valuation would exhaust both modellers' time and degrees of freedom available to regressions (Price, 1976).

A better valuation results from combining the most appropriate aspects of different techniques, as follows.

1. Direct democratic consultation identifies preferred qualities in views (see Hunziker and Kienast, 1999). Ranking two scenic qualities is an easier task, less susceptible to lexicographic intransigence and to intrusion of symbolic and citizen values, than trading scenic quality against sums of money. An expert surveyor takes account of these preferences.
2. Quality is scaled according to systems like that of Fines (1968) (see Table 2):

Subjective such scales may be, but they deliver highly significant correlations between the scores of most pairs of evaluators (Thomas and Price, 1999).



(a) Visibility as the relevant consequence of age
Nearby trees cast close shade

(b) Design as the relevant consequence of age;
Arrangement, not quantity, yields quality

Fig. 2. Hedonic interpretations.

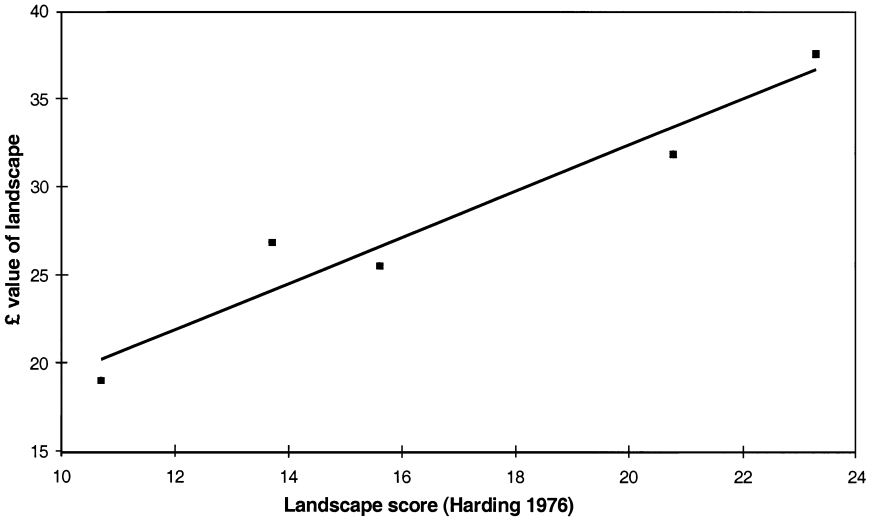


Fig. 3. Aesthetic and cash valuations at five touristic sites in Wales.

3. Finally, intervals of the scale are monetised, from real willingness to pay for travel to sites having different aesthetic quality (Bergin and Price, 1994) (Fig. 3). The approach resembles hedonic pricing, but aesthetic quality is judged holistically, not assembled from the crude variables of mathematical models.

On this basis, the landscape effect of a 100-year farm woodland programme in Wales was worth approximately 1500 million euros (Thomas and Price, 1999).

Passive use values

The remaining non-market products are those – like enjoyment of the thought that a species or landscape exists – which require no physical presence at the site. These values, being furthest removed from a market, are

Table 2
Scales of landscape value

Fines (descriptive)	Fines (numerical)	Harding (1976) and Thomas	Price
Unsightly	0–1	0–5	–V–0
Undistinguished	1–2	5–10	0–V
Pleasant	2–4	10–15	V–X
Distinguished/attractive	4–8	15–20	X–XV
Superb/excellent	8–16	20–25	XV–XX
Spectacular/exceptional	16–32	25–30	XX–XXV

most susceptible to distorting citizen and symbolic valuations, as the *Rafflesia* and *Tringa* examples showed. Yet CVM has been seen as the one method with theoretical potential to extract willingness to pay. The stated preference approach (Sievänen et al., 1992; Adamowicz, 1995) overcomes some serious objections to CVM by offering choices between similar entities, with cash sums included less prominently. In this it resembles the three-step process for landscape valuation given above.

My opinion is that a smaller error is made by ignoring passive use values than by inserting the enormous cash sums that CVM is effortlessly capable of generating, or by participatory debate about particular preservation, in which symbolic values inevitably become enmeshed. There is enough endangered biodiversity and threatened landscape in the world to meet our psychological need to feel protective about something. The *felt* utility loss with disappearance of a species or scene which we never see is usually short-term: we will soon find some other symbol to feel passionate about. Ecosystem functions (valued via potential material outcomes) and valuations of those who directly experience the resource (made via actual payments for access) are both easier to obtain and in most cases more important. And arguably from the intrinsic point of view, it does not matter which creatures exist: all have intrinsic value, and differences between land use schemes may not be great.

Conclusion

This paper argues, perhaps unfashionably, that the defects of CVM in pricing the full range of forest values, far from justifying participatory approaches to decision making, cast even stronger doubts on these approaches.

Is it anti-democratic to write so about participatory valuation (including CVM)? I believe not. Cost–benefit analysis, when well done and using the full range of constituent techniques, is the truly democratic methodology. It bypasses the minority decision constructors, with their concern for short-term *processes*. Instead, it makes direct connection with outcome bearers and valuations expressed as actual willingness to pay for *products*. These are the people whom responsible decision constructors should serve, irrespective of their own interest in processes and contexts.

The function of participatory democracy is to gather information on *what* products are valued, to impart a sense of involvement and commitment to what is chosen, and to provide an ultimate check on abuse of expert methodologies.

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