Deliberative Monetary Valuation

by

Clive L. Spash

Department of Land Economy University of Cambridge

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Abstract

This paper explores how theoretical, practical and political issues are addressed differently by cost-benefit analysis and deliberative-participatory approaches to environmental policy. Theoretically rigorous approaches may prove to be too narrowly defined and so unsuitable because they neglect the requirements of practical implementation. Yet pragmatism which flaunts theoretical understanding lacks analytical power and can mislead policy. How economic methods, such as contingent valuation, compare with those from political science, such as citizens' juries, is an open research question. In addition, the new hybrid approach which is here termed deliberative monetary valuation requires critical review. A comparison of these approaches is made here which draws out the difficulties of developing practical policy tools which are theoretically grounded and avoid political manipulation.

1. INTRODUCTION

Economists concerned with offering government policy advice on environmental problems, ranging from dam construction to the enhanced greenhouse effect, have appealed to monetary valuation. The micro-theoretic basis underlying economic welfare measures has been put forward as a major advantage of cost-benefit analysis (CBA). Indeed following controversy over the CBA estimates included in the second assessment report of the Intergovernmental Panel on Climate Change, the inequitable treatment of potential lives lost in low-income countries was defended by appeal to such theory (Fankhauser, Tol and Pearce, 1997). This reasoning attempts to separate the ethical and political from scientific and technical. Yet, a line of argument against CBA has been the inherent technical abstraction which restricts debate and discussion. Thus, wider concepts of value are excluded by assumption despite evidence for their importance in practice (Spash, 2000b; Spash, 2000a).

Judging the most appropriate approach to policy is a difficult act of balancing performance in theory and practice. If the theoretical basis is ontologically flawed — too abstract, ignoring important components, or factually incorrect — the method will fail to produce theoretically desired outcomes. For example, CBA may lead to an environmental tax on fuel as the most efficient approach for addressing air pollution from vehicles, but this tax may fail in practice due to the perceived inequity which results, i.e. having a disproportionate impact on the poorest in society and creating social exclusion. There are practical consequences if a process fails to be adequately representative of positions, or individuals fail to act as predicted because relevant factors have been excluded from policy formulation.

In order to allow for a plurality of environmental values to be brought into the policy debate a range of formal deliberative-participatory approaches have been put forward (Royal

Commission on Environmental Pollution, 1998). CBA treats policy formation as a set of discreet decision while deliberative-participatory approaches may, depending upon their institutional form and context, be more amenable to recognising policy formation as an on-going process. Part of that process concerns how the public is allowed to have a say in policy and this can be expected to affect policy outcomes, which must be considered in a dynamic socio-economic context.

Formal approaches to participatory-deliberation have developed in a variety of ways (e.g. focus groups, citizens' juries and consensus conferences) which show a different conceptualisation of the policy problem from that assumed in economics. In this paper the general features of such formal deliberation are compared with CBA in order to explore the recent trend toward a synthesis, which I term deliberative monetary valuation (DMV). More generally, this paper considers how a variety of factors bear upon the assessment of alternatives for allowing public input into policy. The following sections discuss theoretical, practical, and socio-political aspects of environmental policy formulation as they relate to CBA, deliberative-participatory approaches and DMV respectively. DMV is assessed against the claims of its proponents that a deliberative element overcomes the weaknesses of environmental CBA. This is followed by a synthesis which aims to draw out key aspects of the analysis and provide a cross-comparison.

2. VALUING THE ENVIRONMENT UNDER CBA

The increasing prevalence of environmental problems has been matched, over the last decade, by an exponential growth in studies employing monetary valuation, with the contingent valuation method (CVM) and other stated preference methods leading the way. Environmental CBA is part of an overall attempt by some economists to incorporate environmental concerns into mainstream economic theory, and show how traditional

economic growth and environmental protection might be made compatible. Environmental and resource economists have been strong advocates of such an approach, although the results of including environmental factors (e.g., entropy, waste disposal and resource depletion) often actually challenge the theoretical basis of neo-classical economics (Spash, 1999). Monetary valuation of the environment has itself spread from the project level and a concern for site specific recreational benefits to policy appraisal and international environmental problems (e.g. ecosystem management, biodiversity loss, global climate change). This has led to controversy, both within the economics profession and on a wider political platform, over the extended use and application of CBA methods.

Economic Assumptions and Model Boundaries

All models make assumptions and simplifications in order to understand the world. However, the standard economic specification of the policy sphere simplifies, assumes away or makes exogenous, components essential to understanding environmental problems, such as complexity, political processes and ethical considerations. For example, implicit ethical choices are made by reducing the value dimension to preference utilitarianism, and discounting the importance of future generations. Such fundamental epistemological choices define the realm in which economists are meant to operate, and the extent to which an economic understanding of the world is applicable.

Economic theory also has a specific conception of the individual. The dominant characterisation of the economic person is as an individualist who is self-interested in regarding entities or acts as only having value if they (directly or indirectly) influence their own utility, and who is rational in the sense of making consistent choices to maximise their personal utility. Well-being is then measured by the satisfaction of personal preferences which are taken to constitute the social 'good'. Economists often regard this model as being

value-neutral because all preferences are regarded as equal. Policy formulation building upon this model prescribes the aggregation of pre-existing preferences expressed through the market to determine social outcomes (i.e., via a social welfare function). In the absence of actual markets, as is normally the case for environmental entities, an hypothetical or pseudo market may be constructed to obtain shadow prices. Thus, freedom is defined by the ability to choose in the market place so as to satisfy preferences.

That preferences are assumed to be well formed and fully informed immediately bounds the decision problem in a very narrow way. As Loasby (1976) has noted, the concept of choice in the neo-classical framework loses all meaning because, assuming perfect information, there is no choice but merely the mechanical act of selecting optimal bundles of goods and services. Indeed the content and meaning of choice is dependent upon uncertainty. Once information is allowed to be imperfect the relationship between learning and acting becomes central so that preferences are no longer exogenous, complete and predetermined. As CVM practitioners have discovered, preferences can be formed both on the basis of the context and content of information provided in a survey (Spash, 2000b). Yet, despite evidence for preference construction many economists remain committed to the characterisation of preferences as stable and coherent so that 'true' preferences can be revealed. A moments reflection upon product marketing makes clear that preferences can be manipulated and human choice in a complex world is far removed from expected utility calculations. Thus, hierarchical procedures and lexical rankings are commonly employed in decision-making, and product loyalty is built upon these very characteristics. Preferences which deny trade-offs (e.g., lexicographic preferences) require serious attention while motives to act can include social-altruism and biospheric orientations (Spash, 2000a). Acknowledging the existence of such considerations is problematic for mainstream economic

theory because of the challenge posed to the relevance of preferences for determining social policy.

O'Neill (1995 p.202) argues that ethical dimension of social choice problems cannot simply be collapsed into desires or wants, and a similar point has been made by others (Sagoff, 1988). This means that preference aggregation is neither ethically neutral nor welfare maximising. Preferences are often ethically loaded and unequal. For example, the preferred mode of sexual satisfaction of a rapist or the preference of a murder for killing are generally regarded as immoral regardless of the individual's willingness to pay to obtain their desires. This may be taken to indicate the need for a clear division between the economic sphere of decision-making and the political realm where moral questions arise. Some have argued that the roles of an individual can be distinctly separated as citizen and consumer (Sagoff, 1988), although this is at best an oversimplification. Such a clear dichotomous demarcation of politics and economics seems rare and even the most innocent consumer item (e.g., an orange or a shoe) has political, ethical and environmental characteristics which come to the fore in one context and are submerged in another (e.g. oranges from South Africa under apartheid, training shoes from Southeast Asia made by child labour). A single problem or choice can be viewed from many perspectives simultaneously and involve a combination of considerations, e.g. cultural, social, personal. Thus while the epistemological origins of environmental CBA are firmly rooted in a conception of the individual as consumer, in practice this fails to match how individuals choose or value the environment.

Empirical Evidence of Multiple Values and Motives

The CVM survey has revealed much evidence of the divergence between theoretical assumptions and how humans value the environment in practice. For example, participants to a CVM survey may misunderstand how their payment will be interpreted by economists

and policy-makers. That is, the process of CBA and its role within an accounting procedure of governance, via the treasury, is far from apparent to those involved in answering CVM surveys. Respondents may believe they are providing support for a social or moral norm. Hence a divergence occurs between the individual's belief that they are giving a charitable contribution and the economic analysts use of responses as welfare theoretic measure of changes in the quantity or quality of an environmental good or service (Spash, 2000b).

Explaining the institutional context of CVM to respondents has revealed discontent with the method and even outrage at the interpretation given to an earlier stated willingness to pay (Burgess, Clark and Harrison, 1998). Individuals may find themselves holding fundamentally different value positions, from the self-interested consequentialist framing under economics, and as a result desire a policy approach which allows them to express deeply held values. Ethical dimensions are often paramount in the environmental policy field. An individuals ethical position affects the values they express, and their acceptance of boundaries between different value concepts.

If respondents are aware that the institutional context conflicts with their values they may refuse to provide a bid or offer a large bid to reflect their concerns. Standard practice systematically excludes these responses as being associated with non-economic reasoning, regarded as 'irrational' or deemed to be attempts to strategically bias the whole exercise. Such explanations reify the data. They also fail to address respondents who deny the relevance of economic trade-offs but actually provide a moderate monetary valuation (Spash, 2000a). Such respondents are found to be willing to pay for environmental improvements (e.g., the re-creation of a wetland ecosystems) while rejecting consequential explanations of their behaviour and instead favour rights (e.g., the right to be free from harm, or protection for endangered species). Indeed repeatedly respondents have been found to hold positions compatible with rights based beliefs and lexicographic preferences (Spash, 2000a).

Thus, the motives behind monetary values become relevant to understanding the content and meaning of the numbers coming out of stated preference methods. Choices being made on the basis of collective values, protecting rights or defending just outcomes are nolonger related to the trade price being sought by economists. However, the practical requirement for obtaining a number overrides the empirical data and theoretical considerations. For example, Burney (2000 p.513), an economist at English Nature, argues environmental valuation and stated preferences techniques are the 'policy reality'. He regards the relevance of incommensurable values or right based ethics for the applicability of stated preference methods as a matter of judgement and states that: "A practical policy maker might take the view that stated preference techniques should quantify these ethical positions, and then as a sensitivity analyses give these respondents a high value in the calculations" (Burney, 2000 p.516).

That such practical approaches may violate value theory seems unimportant. Indeed the theoretical premises behind CBA itself are often violated and appear to be too abstract for consideration in practical environmental policy. The general use of monetary valuation for analysing global issues moves well beyond micro-theoretic foundations where *ceteris paribus* is essential. The changes under, for example, climate change due to the enhanced Greenhouse Effect, loss of biodiversity or degradation of ecosystem functions, are comprehensive rather than marginal adjustments. As Vatn (2000) has noted, the concept of marginal analysis, upon which economic calculus is predicated, proves difficult to define, or irrelevant, due to the inherent characteristic of many environmental problems. As he states "The problem is how to protect systems resilience, not to search for marginal values that have no real meaning" (Vatn, 2000 p.504). Large scale environmental CBA is meaningless in neo-classical terms because it becomes divorced from theoretical requirements for representing welfare and fails to address key environmental considerations. Despite this the

practice of pricing is recommended as a practical input to policy processes. Hence while supposed pragmatists attempt to value the world's ecosystems they are derided as much by neo-classical economists on theoretical grounds as by environmentalists on ethical grounds. Yet, political pragmatism consistently seems to counter both theoretical and moral concerns.

Pragmatism and the Political Role of CBA

CBA is seen as pragmatic because of an assumed consistency with the prevailing 'financial bottom line'. The apologists argue that if environmental policy is to be taken seriously by the institutions of government, monetary valuation must be accepted as a necessary evil to be included as part of an array of coexisting (but unspecified) methodologies. The danger here is the extent to which such pragmatism overrides theoretical constraints and allows results to be manipulated.

The ability to distort CBA to elicit politically convenient results is exacerbated by the difficulties of explaining the principles behind the methods. There are certainly many questionable practices and a few illustrations can be mentioned. The use of willingness to pay instead of the more theoretically correct compensation measure for resource damages has been justified on grounds of delivering 'conservative values' (see critique by Knetsch, 1994). The lack of sensitivity analysis in CBA allows results to be reported as if definitive and universally applicable (Merrifield, 1997). Apparently simple technical choices can totally alter policy advice. For example, subjecting the results from a CVM study to a 25% discount rate and then justifying this in a footnote on the basis that individuals pay such rates on their credit cards (Department of the Environment Transport and the Regions, 1999). In this case the result was reported without sensitivity analysis and dramatically reduced a proposed tax on the aggregates industry, which was then dropped.

That CBA is implicitly embedded within a political process where results are mediated through institutional design has been used as an argument for why critics should show less concern. That is the argument is often made that CBA results are but one input to the 'decision-making process' and alone will never decide acceptance of a project or policy. As was discussed above, the CBA process self selects certain types of values. Other values and interests are then to be taken into account elsewhere in the political process.

Yet some advocates claim CBA has democratic advantages arguing this is a process of "one person one vote" whereby the public can express what they want (Burney, 2000 p.515). The extent to which the 'one person one vote' analogy applies to CBA is limited because 'votes' are relative to income, although this has sometimes been described as an improvement over voting because the intensity of preferences can be expressed. A more fundamental difference is the appeal to representation by statistical sampling theory, where 600 to 1500 randomly selected people can represent a national population (Mitchell and Carson, 1989 p.108). In practice obtaining a truly random sample of the population is impossible because all methods have their flaws (e.g. using voter registration, telephone listings, or postcodes). Systematic bias can arise where non-response affects the sample and data set gathered. More importantly, as O'Neill (2001 forthcoming) points out, even were such a statistical sample obtainable this would only meet one of the many relevant types of representation. In practice concerns also arise over the extent to which specific sections of society are represented and/or have their viewpoints taken into account.

3.Deliberative Monetary Valuation

A small but growing literature concerns combining environmental valuation with various forms of deliberative process. This is logically associated with the long standing apologia for CBA that it is but one input into a comprehensive social decision process. That process has

rarely been specified, although some now describe it as ideally discursive (e.g., O'Riordin, 1997). In addition, the classification of individuals as consumers in some realms but citizens in others (e.g. when deciding about 'public goods') has lead to the suggestion that merging valuation and deliberation might better reflect citizens preferences (Sagoff, 1998). Others, realising that preferences are constructed but believing environmental valuation is unavoidable, appeal for "some way for participants to iterate their ideas before revealing a willingness to pay" (Burney, 2000 p.514).

Foundations and Categorisation of DMV

In fact the search for validity in applying CBA methods has lead to a variety of appeals to interest groups or members of the public in an attempt to supplement the normal information content of prices placed on the environment. Thus, the travel cost method may be combined with an interview approach in order to sustain assumptions of how individuals behave, value time and relate to the environment. Hedonic pricing has sought corroboration from estate agent valuations as representing 'informed' preferences. Focus groups have been used in conjunction with the CVM to test survey design on the basis that group deliberation could validate the information content and help identify design biases. This last approach is most clearly where deliberative practices have begun to enter. For example, the largest CVM study in the UK was conducted on environmental impacts associated with aggregates (Department of the Environment Transport and the Regions, 1999). The interesting feature of this work in the current context was the informal use of vested industrial interests (stakeholders) in the first part of the study and the use of public focus groups in the design stage of the second. Although the feedback from the public proved problematic by diverging from economic assumptions (e.g. the expressed desire for community compensation unrelated to the individual), and neither process was formally reported.

Thus, two broad approaches to combining deliberation and monetary valuation can be identified. The first regards monetary valuation as basically sound but being able to benefit from supplementary, and often informal, processes borrowing elements of deliberation. The second sees the use of deliberative approaches as a new method allowing the (collective or individual) production of a monetary valuation for environmental goods and services. Under the first approach a variety of alternatives exist, and monetary valuation may be either followed or preceded by some element of deliberation. Stakeholder participation, as mentioned above, may be employed to validate outcomes. The implication being that ex post deliberations can be used in some way to adjust valuation results or their presentation. Deliberative processes and environmental valuation may also be sequential. For example, Kenyon et al (2001 forthcoming) selected a sub-sample of participants from a CVM for a citizens' jury on the same environmental issue. Ex-ante deliberation has been employed in designing CVM surveys with the use of focus groups to test the wording and respondents understanding of survey questions. Deliberation is then regarded as useful in providing insight into the processes by which respondents produce their willingness to pay or accept. This may be extended to allowing a deliberative process to determine the options or institutional context to be valued in the survey.

The second approach is what we term deliberative monetary valuation as advocated by, for example, Brown et al (1995), Jacobs (1997), Ward (1999), Kenyon et al. (2001 forthcoming), James and Blamey (2001). DMV is the use of formal deliberation concerning an environmental impact in order to express value in monetary terms for policy purposes, and more specifically as an input to CBA. For example, consider a proposal to build a new road through a wilderness area and so destroy the habitat of a number of rare or threatened species. A group of citizens would be selected and meet to discuss information about these environmental damages associated with the development. Known costs and benefits

(discounted) would be presented, while those pertaining to environmental damages would be deliberated. The citizens would form a jury aiming to provide a monetary value for environmental damages which might be in terms of an individual willingness to accept compensation to allow the project to proceed. The result would then be incorporated into a net present value calculation to determine the viability of the project.

Developing DMV Practice

Ward (1999) regards DMV as a potential improvement over CVM because subjecting the valuation process to democratic deliberation should increase both the validity and legitimacy of the outcome. He argues for the use of such a DMV approach in circumstances concerning 'big issues' where the 'potential costs of making the wrong decision are large' (1999 p.93). Although, where the stakes are high the temptation for manipulation of DMV would be greatest. Advocates of a DMV approach tend to assume it is capable of simultaneously addressing political, ethical and instrumental dimensions of environmental problems, whilst maintaining the use of a money metric (e.g., Brown, Peterson and Tonn, 1995 p.253). However, this pluralism means the results may be inappropriate for use in a CBA. For example, Brown et al (1995) use the term 'values jury' to describe a process similar to a citizens' jury, but where a decision 'hinges on valuation'. However, environmental damages are then being regarded in terms of ethical and social norms rather than placing a trade price on the environment and so fail to fit within a CBA framework. DMV also moves away from CBA if the outcome is in terms of a single collective value or an individual valuation for an 'average' member of the group rather than a set of individual valuations which are then averaged (as under CVM).

Yet, DMV does begin to address some of the criticisms levelled at environmental valuation because preferences are seen as being, at least partially, constructed during the

valuation process. Participants deliberate and justify their positions in their own terms, producing outcomes that conform to a broad concept of rationality. However, DMV is fundamentally instrumental in approach and only adopts a deliberative mechanism to achieve a monetary value. This must conflict with the ethical status of the environment which distinguishes distributional, social and moral reasons for regarding entities as outside the realm of money and exchange (O'Neill and Spash, 2000 p.527-528). Refusals to place a price on an entity can then be understood as instances of expressive rationality where the understanding of entity or relationship is constituted of a non-tradable aspect. As Lenman (2000) points out: "Environmental politics is thus arguably less an area where our political culture is divided by sharply conflicting values than an area where values that are widely shared come into pervasive conflict with widespread consumer preferences". If this is so, DMV seems set on creating greater conflict by assuming the dominance of the later over the former.

Another aspect of DMV is the social and psychological impact it has upon participants and the way in which they approach a given issue. The message to the participants is that all public acts are to be regarded as mediated by financial transactions. However, participatory-deliberation allows increased scope for heuristic reflection over environmental values and enhances the ability to cope with complexity. The cognitively demanding task of absorbing information about an environmental issue would therefore be contrasted with requiring participants to compress all aspects into a single metric. Plural and incommensurable values constitute distinct dimensions of environmental choice. Thus, successful deliberation under DMV might be expected to result in serious questioning of the financial terms of reference imposed by the analyst. This could lead to either dubious outcomes or the rejection of any pricing request. Blamey and James (1999) regard these problems in terms of a divergence between artificially imposed and actual relationships with

the environment. They argue DMV may be best applied where individuals have an actual and direct financial relationship with a project. Where a scenario is hypothetical they suggest jurors be asked to 'suspend belief' or encouraged to believe that the payment scenario is real — although they themselves concede this violates the principles of deliberation and communicative rationality.

Thus, communicative and expressive rationality and plural values may be crowded-out by the retention of monetary valuation as the focus for policy-making (O'Neill and Spash, 2000). As the work of Frey (1997) shows offering monetary solutions to social problems can crowd-out civic virtues. Thus, environmental degradation presented as a socio-political issue can stimulate what might be termed good civic behaviour, but once the issue is phrased in terms of compensation payments and economic incentives the motives to act in the best interest of others are eroded. This line reasoning can be extended to differences in public expectations between public and private ownership where socio-political goals are emphasised by the former and private gain by the latter. More generally the range of reasons as to why an environmental change matters is constituted of a variety of relationships including those with family, friends, and future generations.

Dissenting Views, Representation and Manipulation

Under CVM protest bidders or those who refuse to nominate a price may be excluded or substituted by average or statistically representative values, during data aggregation. This exclusion of data is a highly dubious practice, but is not easily achieved under DMV. Thus, although challenging the economic approach, this may actually be a positive aspect of DMV, because the policy contours are highlighted rather than bulldozed. Under DMV, a respondent's failure to articulate a monetary valuation compatible with economic theory becomes a point for discussion and illumination by the participants.

That DMV necessarily relies upon small numbers to produce a deliberated valuation means it is no longer statistically representative. Jacobs (1997 p.223), suggests that the problem of statistical representation can be overcome by holding parallel DMVs. However, financing the replication of DMV processes just to achieve statistical representation seems unnecessary if the aim is representation of interests through discourse. Each subsequent forum would then reveal fewer additional insights into the collective choice problem. In addition, statistical representation fails to address the impossibility of expressing certain interests (e.g. ethical concerns) via a monetary discourse. Holding multiple DMVs may also exacerbate strategic behaviour where participants are aware of the outcomes of previous DMV processes and adjust their arguments and valuations accordingly.

Strategic behaviour may prove more problematic for DMV than either valuation or formal deliberation. This is because DMV provides the financial impetus for strategic behaviour and a process whereby strategy can be developed and others recruited. However, the greatest scope for strategic manipulation of process lies with the organisers. Where participants are overwhelmed by the process they can feel under duress to meet the expectations of the organisers. Under formal deliberation participants can question the validity of the process but under DMV this possibility is heavily restricted.

In summary, the DMV approach has a deliberative component, but is restricted to producing a monetary value. There is little improvement over CBA when the process only permits the evaluation of specific predetermined options on grounds of fiscal viability. The environment is still regarded as a commodity under DMV which crowds out civic virtues. This may be less of a concern for variations of DMV that assess redistribution of public funds where participants avoid valuing the environment per se. However, truly discursive approaches would require participants to reflect upon and develop other options. DMV

might be used where a participatory-deliberative processes has already yielded specific options relating to the allocation of public funds. That is, the outcome of a formal deliberation could be the need for monetary valuation in the final stage. Although, the correct perspective may then be that of Lenman (2000) where CBA techniques are only legitimate as an input into, not a substitute for, political deliberation.

4. ASSESSING APPROACHES TO ENVIRONMENTAL POLICY

This section draws from the above discussion the importance of three broad grounds upon which to judge approaches to environmental policy. First is the theoretical basis of an approach, the assumptions upon which it is based and how far these address key aspects of policy concern. Second is the transformation of theory into practice and the extent to which pragmatic considerations interact or override theoretical concerns. Third is the political need for representative approaches which are free from manipulation by vested interests, but also address the existence of political power blocks. These three areas inevitably overlap.

A summary of distinguishing features across these three areas is used to show, in Table 1, how monetary valuation and formal participatory-deliberative approaches diverge. This allows analysis of the ways in which environmental valuation and deliberation have been translated into DMV. The table also provides a summary of key points discussed in the preceding sections.

Whether explicitly or implicitly, all prescriptions for the formation of environmental policy make simplifying assumptions about the various aspects of a problem and create a world of partial ignorance (Loasby, 1976). This can be due to positive and active exclusion of information, i.e. certain knowledge being regarded as external to a subject area, unverifiable, or taboo. Alternatively, a passive error may occur due to confusion, inaccuracy, an absence of information, ambiguity, risk or vagueness (Dovers and Handmer, 1995).

Environmental policy covers a multitude of components from the individual (concerning desires and aspirations) through socio-economic processes of manufacture and exchange (producing waste and depleting resources) to the political. All these activities take place within pervasive ecological processes. Excessive abstraction of a policy problem can therefore undermine the ontological validity of any prescription. That is, recommendations which are based upon theories which exclude relevant facts create errors and can be seriously misleading.

The epistemology of environmental policy must therefore address complexity. Environmental policy is necessarily complex because human interaction with environmental systems involves numerous and varied factors which must be taken into account. As ecology has shown, the interactions and feedback mechanisms involved in understanding even apparently simple ecosystems processes defy meaningful treatment of parts as separable from the whole. This challenges traditional atomistic and mechanistic approaches to scientific understanding as adopted from physics and extended into the social sciences (Norgaard, 1994). Methodologies are required which accept the limits of reductionism and directly address complexity. The potential to include a multitude of dimensions during a formal deliberative process means the complexity of environmental policy can, in theory, be addressed.

The theoretical treatment of the individual and their interpersonal psychology reveals fundamental differences between disciplinary approaches. These concern how an individual acts within the domains of environmental policy, the economy and polity. The treatment of individuals as 'economically rational' (i.e., self-interested and aiming to maximise utility), is far removed from the individual as a member of a community who aims to achieve a collectively best outcome. Thus, economic theory tends to assume that preferences about collective environmental goods and services are predetermined and require no further

explanation. Preference construction means taking into account their formation and change due to campaigning, media coverage, advertising or survey processes. Thus, deliberative forums will raises questions as to the social construction of behaviour and analyse the underlying motives. Biospehric and social-altruistic attitudes and their value basis are then seen as relevant to environmental policy. Such attitudes are rarely considered in economics, where the practical concern is defined in terms of jobs, low inflation and growth of gross domestic product.

Practical considerations should, however, concern whether a policy recommendation is feasible to implement, can be achieved and is deemed acceptable within the wider context of social values. Particular instruments are expected to perform as intended and problems which might be encountered must be foreseen and dealt with effectively. Where recommendations may fail in practice this can be due to inadequate representation of social processes leading to problems such as social exclusion, counter intuitive results from regulation and rejection of policy. For example, when proposing a policy involving environmental degradation a monetary payment may be seen as compensation by an economist and as a bribe to act inappropriately by the general public (Frey, 1997). That an assessment of the appropriate amount of compensation may exclude certain public attitudes (e.g. protest bids), or employ inappropriate social norms (e.g. willingness to pay), is itself often justified on grounds of practicality.

Thus, the role of agents, and the agencies within which they work, can be seen as part of the agenda affecting environmental policy formation. The aim of producing a set rate of return and showing financial viability is driven by the Treasury, and hence more time may be spent on producing numbers to justify prior decisions than considering policy implementation. As the chief economist at the Environment Agency has pointed out, environmental agencies are constituted of individuals and groups who approach

environmental problems through their own professional and personal values and are motivated by their own institutional priorities (Palmer, 2000). Deliberative experiments have failed to be plugged-in to the decision process or to define their role within existing institutions; if they are to have a place in articulating environmental values the institutional context must be analysed (O'Neill and Spash, 2000).

Justifying particular methodological approaches to policy assessment as the 'way things are done' is often short-sighted and plays to particular vested interests. There is some danger in having theory act merely as a support for political action. Theory cannot merely be the result of pragmatic considerations or it loses independence and explanatory power, becoming a mere artefact of the political process. Instead the concern is to alter the institutional and political sphere on the basis of theoretical insight and in the face of failures to address persistent problems.

However, the interactions between theoretical understanding and the requirement to be practical do affect academic culture. A feature of the modernist approach to environmental research is the participation of the 'professional' natural scientist and neo-classical economist in public decision-making through a dominant belief pattern (logical positivism), which they then reinforce. This has resulted in an enduring fixation, particularly in economics, with the relevance of 'objectivity' for solving complex environmental and social problems. Thus, calls for more research are common, as if no decision could be made without 'the truth' having first been revealed. This approach inevitably denies the ever present state of partial ignorance in which humanity lives. Economists, for example, create ignorance within their profession about the dynamic process of decision-making within which decision tools operate. This is also evident in the official model of decision appraisal. The linear approach involves analysing an issue to better inform a final decision, and good analysis is then assumed to create better decisions. However, as Palmer (2000 p.416) states:

> "In many cases, the decision, or key elements of it, may be 'made', or may emerge, in advance of the more detailed analysis. In the traditional model, where the analysis precedes the decision and informs it, this may be seen as a failure: the analysis is being used for *ex post* justification rather than *ex ante* information.
>
> Therefore while this model is in general a good one, it does neglect the dynamic nature of decision-making."

Systems of governance fall within a spectrum from imposing control by over-riding popular opinion (e.g. expert testimony, scientific facts), through to creating institutions where deliberative-participation is encouraged. Due to the dynamic nature of the decision process, which Palmer highlights, choice among these alternatives will have serious repercussions. Thus, when dealing with technological developments which challenge environmental stability the role of public participation, if neglected, may force its way into the policy debate in politically disruptive forms to correct policy in balance, as has been seen with cases such as food safety, nuclear power generation and waste disposal, and genetically modified crops.

Calls for the opening-up of scientific processes via public participation in environmental policy formation involve issues of power. However, disciplinary boundaries draw lines around the relevance of power politics and restrict their incorporation in policy advice, and this is especially so where a mono-disciplinary perspective is adopted and value debate restricted. For example, environmental economics is linked to a specific political economy, one where markets are the main social institution and the treasury is the central administrative body of governance. This means policy approaches, such as CBA or deliberative-participatory forums, arise within specific political contexts which affect their development and use, and they respond to political institutions which ultimately adopt, reject, or distort their outcomes.

5. CONCLUSIONS

Simplifying complex environmental problems is necessary but the boundaries being drawn around knowledge must be relevant, explicitly considered and accepted. These boundaries also require on-going reconsideration and this means having a flexible institutional context. That is, systems management needs to be adaptive and where multiple criteria are being taken into account elsewhere this must be explicitly analysed. Flexibility is required in the face of new information. CBA is best suited to bounded problems which are spatially and temporally discrete and which can be addressed within a single jurisdiction using the set of existing political institutions (i.e. micro-problems as defined by Dovers and Handmer, 1995).

Overall, in terms of both theory and politics, DMV is most consistent with CBA and closely based on a rational-instrumental, rather than deliberative, conception of the environmental policy sphere. This conclusion hinges on two aspects of DMV: the narrowing of deliberation to consider only a specific set of predetermined policy options; and the conversion of environmental entities into commodities. Deliberative processes shift the emphasis from simple aggregation of existing preferences to focus on processes through which preferences are formed and transformed. There are significant advantages to using formal deliberative processes such as citizens' juries. However, caution is also needed because such processes are highly sensitive to design and context.

Ultimately, a variety of approaches are needed but this means recognising when and how particular tools are unsuitable. The development of principles for the use of both CBA and participatory-deliberative approaches is an important task which must cover the theoretical and political terrain. Unfortunately past work on defining theoretical limitations within CBA has been ignored or overridden on the grounds of meeting practical needs. This merely re-emphasises the importance of institutional analysis.

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Table 1. Comparing Environmental Policy Approaches

		Monetary Valuation	Deliberative Forums	Deliberative Monetary Valuation
Theory	Individual Ontology	Informed Consumer: purchasing structured attributes i.e. 'goods'	Citizen capable of reflection	Uninformed consumer-citizen: attributes revealed by a process of reflection
	Preferences	Preferences are given	Preferences are constructed & negotiable	Preferences are both given & constructed
	Rationality	Instrumental assuming all dimensions are utility	Communicative Process: all dimensions explicit, including ethical	Instrumental/Bounded Communication once all dimensions in monetary terms
	Orientation	Outcome	Process	Process as means to an outcome
	Social Ontology	Society is the sum of self-interested individuals	Individuals are citizens within a social context	Society consists of self-interested consumer-citizens
	Justification	Pragmatism: how things are done	Transformation: how things can be done	Pragmatism: consensus seeking
Practice	Framing	Set by funding agency with input from consultants/experts	Negotiated between participants & researchers	Set by funding agency with possible restricted negotiation by participants
	Key Authority	Treasury	Public	Treasury
	Value Misrepresentation	Social & moral norms as individual self-interest	Individual preference in the language of the common good	Both types of behaviour possible
	Political Manipulation	Possible and encouraged by technical closure	Possible, but mitigated by communicative rationality	Possible but mitigated if exploration of technical issues allowed
Polity	Representation	Statistical	Political social democratic	Political market liberal
	Social Impact	Crowds-out civic virtues, reinforces individualism	Emphasises social constructs	Exposes conflict between market individualism and civic virtues, possible increase in scepticism