Is economics being outcompeted in environmental decision making?

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Summary

Economists are in danger of being outcompeted in environmental decision making by researchers from other disciplines. Decision makers need information to be able to evaluate and to make choice. Economists apply considerable effort to complete non market valuation studies, and cost benefit analyses, to inform decision makers but the information generated in those studies is often difficult for non-economists to understand. Decision makers may also have an aversion towards monetary valuation of preferences for aspects of the environment. Alternatives to non market valuation and cost benefit analysis, including cost effectiveness analysis (CEA) and cost utility analysis CUA), provide low cost, practical ways to evaluate projects and provide information for decision makers. Economists need to think carefully what is most important, the need to evaluate and provide information to aid decision making, or pursuit of a gold standard of monetising Benefits and Costs in all evaluations.

Economics has long understood its raison d'etre as the study of human behaviour when there are scarce resources, and choices in how to reach an objective. Lionel Robbins characterisation of economics provides a powerful rationale for economists to contribute to decision making in many spheres of human behaviour (Robbins, 1935). Economics has the potential to help decision makers make optimal choices to achieve goals, choose optimal input contributions, deliver outputs at least cost, allocate effort and resources at optimal levels.

Delivering on that potential, however, is hindered by the need to quantify, and often to value inputs, outputs, benefits and costs. Where that can be readily accomplished, e.g. firms selecting their product mix, and there are few unpriced items, or external effects, constrained maximisation or minimisation is a useful tool. Real options analysis and other procedures allow ways to cope with risk and uncertainty.

There are plenty of cases where some information is lacking for economic analysis and new approaches are needed to generate information, or alternative tools need to be used to help decision makers. The lack of prices or values for many items – human life, clean air, visibility, several ecosystem services - have led to the development and continuing improvement in Non Market Valuation (NMV) techniques. Hundreds of studies using Travel Cost Method (TCM), Contingent Valuation Method (CVM), and Choice Modelling (CM) have been completed and

used to generate Willingness to Pay (WTP) and consumer surplus estimates for very many items. Two databases that contain many such studies are www.nnoepeconomics.org; http://www.evri.ca/. NMV studies are costly and typically involve considerable effort by highly skilled researchers and their assistants. The effort applied by economists (the suppliers) to NMV studies is immense. The payoffs, however, from those efforts are far from obvious.

The cost of completing NMV studies is very high – my guesstimate is a comprehensive CM study might cost $100,000 to complete. It is interesting to also ask how well understood and how widely used are the results from NMV studies? Are results from these studies accepted by decision makers? If they have an aversion towards use of economic estimates of, for example, the value of a statistical life, change in the level of an ecosystem service or improvement in air quality, there may be little social benefit from the NMV studies. Equally important, if NMV methods, and the welfare measures we use, are not readily understood or accepted by stakeholders and decisiomakers, the payoff from NMV studies may again be slight.

Economics is anthropomorphic, and many people in the profession prefer to estimate the magnitudes of both costs and benefits in monetary units. If that preference for monetary valuation necessitates measurement of WTP and consumer surplus via techniques such as CM this runs the risk of making the discipline of economics uncompetitive in environmental decision making. If we consider environmental decision makers as customers, and recall the maxim the customer is always correct, we should not be too surprised that alternative approaches to economics are proposed to aid environmental decision making. The customer is likely to seek low cost, rigorous, readily understood information to aid decision making. There are alternative techniques to provide information for environmental decision makers. Some of the techniques are relatively low cost and more easily understood than are Cost Benefit Analysis (CBA) and NMV. They may also provide information that is perceived to be more relevant in environmental decision making than are WTP and consumer surplus.

Cost Utility Analysis (CUA) and Cost Effectiveness Analysis (CEA) measure cost in monetary units but use non-monetary measures of output. These approaches to evaluation are not new, and are widely used to enable evaluations in some fields, most notably health and social services delivery. They measure the progress made towards a goal as a consequence of a project or programme. CUA and CEA are quicker and cheaper to complete than are CBA studies that require use of NMV techniques. The results generated by CUA and CEA are more readily understood, and hence are more likely to be accepted by decision makers than are WTP or welfare measures generated by CBA and NMV studies.

CUA was developed about forty years ago by health economists and provides a middle way between CEA and CBA (Drummond 2005). Where CEA measures output in one dimensional units – hectares of parks cleared of pests, tonnes of CO2 removed from the atmosphere - measurement of output in CUA is multi dimensional and can cope with variations in quality of output. CUA has been adapted for use in ex post environmental evaluation. Field tests indicate its practicality, versatility and ability to provide readily understood information for decision makers (Cullen et al., 2001, 2005a; Haddock et al., 2007; Hadjowicz et al., 2007). The speed and cost advantages of CUA over CBA and NMV studies is strikingly illustrated by the work of Joseph et al., (2009). That study used CUA to complete priority rankings for 2000 threatened New Zealand species projects. The information generated is readily understood by decision makers. The project was completed within less than 1.5 years. It is inconceivable that CBA and NMV studies could completed within a similar time period, at a competitive cost, to enable decision makers to rank 2000 threatened species projects.

Economists who ignore the competitive advantage of CUA will do so at their peril. At the recent 2009 Fenner Conference on Environmental Decision Making held in Canberra, http://www.conferenceplus.com.au/fennerconf/2009/ only a handful of economists were present. Almost all of the 240 audience – researchers, government officials, natural resource managers – were non-economists. Attendees at the event heard that "economics is just mathematics with lots of big words" and other shibboleths (Possingham 2009). Those assertions are of course huge errors, as mathematics is the universal language, but it is not a social science. Objective functions have to be chosen by decision makers or managers, or asserted by researchers/evaluators. Despite statements to the contrary, the approaches to evaluation and environmental decision making espoused and reported at Fenner 2009 are, broadly speaking, economics. The important point for AARES members and the profession to note well is that the research reported at Fenner 2009 was almost entirely completed by non-economists. Non-economists are delivering research to aid environmental decision making without the direct input of professional economists, and the customers seem to be willing to pay for it and use the information.

Economists need to think carefully what is most important – the need to evaluate and provide information to aid decision making, or the need to pursue a gold standard of monetising Benefits and Costs in all evaluations. The reality is that current resource allocations are often far from Pareto optima. There is a desperate need in many cases such as biodiversity management to evaluate projects and programmes (Ferraro and Pattanayak, 2008). Contrary to the assertion made by those authors evaluation does not need to use state of the art techniques. State of the art approaches such as CVM and CM can be much less useful than practical tools such as CEA and CUA (Cullen et al., 2005b). Ostrich have a reputation for avoiding reality. Environmental economists should avoid making the same mistake.

What are the risks associated with using CUA (MCA) approaches to decision making? The CUA approach typically generates "cost effectiveness" measures that can be ranked in merit order. Decision makers can allocate investment funds until their budget is exhausted. This stance will lead to investments which contribute to an objective such as improved environment or health. It does not provide any assurance that economic welfare will be maximised, as the output measures in CUA (QALY, COPY) are not valued using WTP approaches. "Values" are assigned in CUA (MCA) using non-anthropomorphic weighting such as taxonomic distinctiveness, or a measure such as age of patients. This may seem a significant error to many economists, but it may not be judged a flaw by non-economists.

Decision makers who are unconvinced of the usefulness or acceptability of estimating WTP for statistical human life or aspects of the environment may strongly prefer non-monetised measures of output. A dogmatic stance by economists on what is appropriate information to use in environmental decision making may result in economists being sidelined, their expertise ignored and customers choosing other professions to provide them with information for decision making.

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