Cost Benefit Analysis Forum

WHO IS BENEFITING? | **17 JULY 2015**

The Flexibility of Benefit Cost Analysis

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Limitations or Opportunities

- **BCA criticised for:**
  - **Ignoring environmental impacts**
  - **Ignoring distributional consequences**
  - **Ignoring risk**
- **Used to justify 'alternative' decision making tools**
  - **Multi-Criteria Analysis**
  - **Social impact assessment/ Environmental impact assessment**
  - **Safe Minimum Standards**
  - **Precautionary Principle**

- **No tool is complete … information is always imperfect**
- **BUT need to be wary of tools that are conceptually flawed or logically inconsistent**
- **All the alternatives are just that or 'not fit for purpose'**
- **BCA has a sound and well understood conceptual base that doesn't pretend to be anything else other than utilitarian, consequentialist and anthropocentric.**

Look at the alternatives

- **MCA: well established critique**

- **SIA/EIA: information collection and presentation but don't attempt to address trade-offs**

- **SMS: Don't even consider trade-offs if some biophysical threshold is breached (eg extinction) … except if there is an 'unacceptable cost'. The philosophical 'slippery slope' of giving trump status to a particular impact is thus entered! Trade-offs then between the multiple 'trumps'. How can that be assessed?**

Precautionary Principle

- **Strong form (Wingspread Statement):**

- **'When an activity raises threats of harms to human health or the environment, precautionary measures should be taken, even if some cause and effect relationships are not fully established scientifically'.**

- **Where there is some danger of environmental harm arising from a new development, it's best to hold back**

- **Burden of proof is placed on the advocates of change to demonstrate that no environmental harm will occur under their proposal**

Implications …

- **Change is untenable: any development comes with the potential for some environmental harm.**
- **The future cannot be known with certainty**

- **BUT the Principle also disallows the continuation of the status quo … it's environmental impacts are also not known with certainty**
- **We are left 'in limbo'!**

What can BCA offer?

- **Distribution and risk can be incorporated into BCA … and so avoid the pit-falls of the alternatives**

- **Integrating distribution requires 'weights' to be applied according to who gains and who loses**

- **Integrating risk requires estimates of probabilities of outcomes and an understanding of risk preferences.**

Equity?

- **Including distributional 'weights' has been traditionally avoided in BCA**

- **Whose weights?**

- **Subjectively determined?**

- **Interdependency of equity and efficiency?**
  - values are dependent on distribution of wealth
  - is public sector investment the appropriate vehicle for wealth redistribution?

Risk?

- **Widely accepted that risk (and uncertainty?) can be integrated into BCA through the use of expected values**

- **Sensitivity analysis of different possible outcomes**

- **Monte Carlo simulation of the probability distribution of outcomes**

- **But little attention given to risk preferences beyond theory:**

  - **Public investment portfolio size and diversity results in risk neutrality?**

Preferences

- **To go further, need to recognise that incorporation requires the objective estimation of the preferences of people:**
  - **across different distributions of outcomes**
  - **for risk**
- **Potential to explore these preferences using non-market valuation techniques, particularly Choice Modelling but also the Contingent Valuation Method**

Choice Modelling

- **Survey respondents asked to choose between alternative futures described by 'attributes'**

- **Each alternative delivers different 'levels' of the attributes**

- **Can use 'distribution' and/or 'risk' as attributes of the alternatives**

Generic example

Attribute	Option 1: Status Quo	Option 2: Change	Option 3: Change
Environment (Species protected)	5	7	12
Chance of success	100%	80%	10%
Distribution of gain (Present:Future)	(80:20)	(50:50)	(60:40)
Additional tax	$0	$50	$20

Example: Distribution

- **Scarborough, H and J. Bennett (2008). 'Estimating Intergenerational Distribution Preferences',** *Ecological Economics*, **66 (4): 575-583.**

- **Choice Model involving intergenerational equity**

- **Choices made between options that differed in their distribution of environmental benefits between new born, 25 year-old and 50 year-old.**

REFERENCE KEY

In questions 1-5 you are asked to choose between three potential environmental policies that would have a set of one-off impacts on the well-being of people in different generations. Please indicate which policy you consider would be best by ticking one box in the final column for every question. You always have the option of maintaining the current situation by choosing Policy C.

The people affected by the policies each have the same characteristics except that they are in different generations;

Aged **50** = First generation: represents those now aged 50.

Aged **25** = Second generation: represents those now aged 25.

New Born = Third generation: represents those born in 2005.

Changes in well-being for the generations are represented as follows. The dollar values are all in today's dollars to make comparison easier.

= a one-off **benefit** of $1,500 per person.
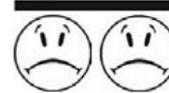
= a one-off **benefit** of $1,000 per person.

= a one-off **benefit** of $500 per person.

= no change per person.

= a one-off **cost** of $500 per person

= a one-off **cost** of $1,000 per person.

- **Social marginal rates of substitution:**
  - "The willingness of respondents to trade the utility or well-being of one group for another"
- **Aged 25/Aged 50 : 1.63**
- **Newborn/Aged 50 : 2.23**
- **Newborn/Aged 25 : 1.37**

Contingent Valuation Method

- **One alternative scenario offered to survey respondents at a cost**

- **Referendum style question asked (Yes or No to a change from the status quo to the proposed alternative)**

- **Responses modelled to infer willingness to pay**

Example 1: Risk

- **Akter, S. and J. Bennett (2011). 'Household perceptions of climate change and preferences for mitigation action: the case of the Carbon Pollution Reduction Scheme in Australia',** *Climatic Change*, **109(3-4): 417–436.**

- **Willingness to pay was negatively influenced by peoples' perceptions of the chances that the Carbon Pollution Reduction Scheme would be successful.**

Example 2: Risk

- **Rolfe, J. and Windle, J. (2013) 'Including management policy options in discrete choice experiments: a case study of the Great Barrier Reef', *Canadian Journal of Agricultural Economics*, 61: 197-215.**

- **Included an attribute "Will it happen?: Level of certainty" in study of alternative policies in the GBR**

- **The attribute "Certainty" had a positive and significant impact on willingness to pay.**

Conclusions

- **BCA has a solid conceptual base on which recognition of distributional and risk elements of decisions can be integrated**

- **Distributional and risk issues boil down to social preferences**

- **The key is to avoid subjectivity in estimating those preferences**

- **CM and CVM have the capacity to produce objective estimates of distributional preferences and risk aversion**