



Optimising Environmental Policy: The Role of Cost-Benefit Analysis

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Assessments in Policy Making

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Examples of OECD Government Practice and Guidance

USA – Executive Orders 12291 (benefits outweigh costs), Executive Order 12866 (benefits justify costs).

UK – Regulatory Impact Assessments must ‘consider’ costs and benefits (and their distribution)

EU – Article 130r of Treaty of EU – shall take account of ‘the potential benefits and costs of action or lack of action’

Australia – Council of Australian Governments “has agreed that all governments will ensure that regulatory processes in their jurisdiction adopting the option that generates the greatest net benefit for the community”

The Basic Principle of Cost-Benefit Analysis

- A regulatory change produces some benefits and some costs. The issue is whether the net benefits are positive AND whether the a different regulatory change might have produced even more positive effects.
- We should go on making changes to regulation until there are no further changes that are possible which produce positive net benefits.
- This is a situation when the rate of change of net benefit with respect to changing regulation is zero.
- Equivalent to point at which the social marginal cost and social marginal benefit of changing regulations are equal.

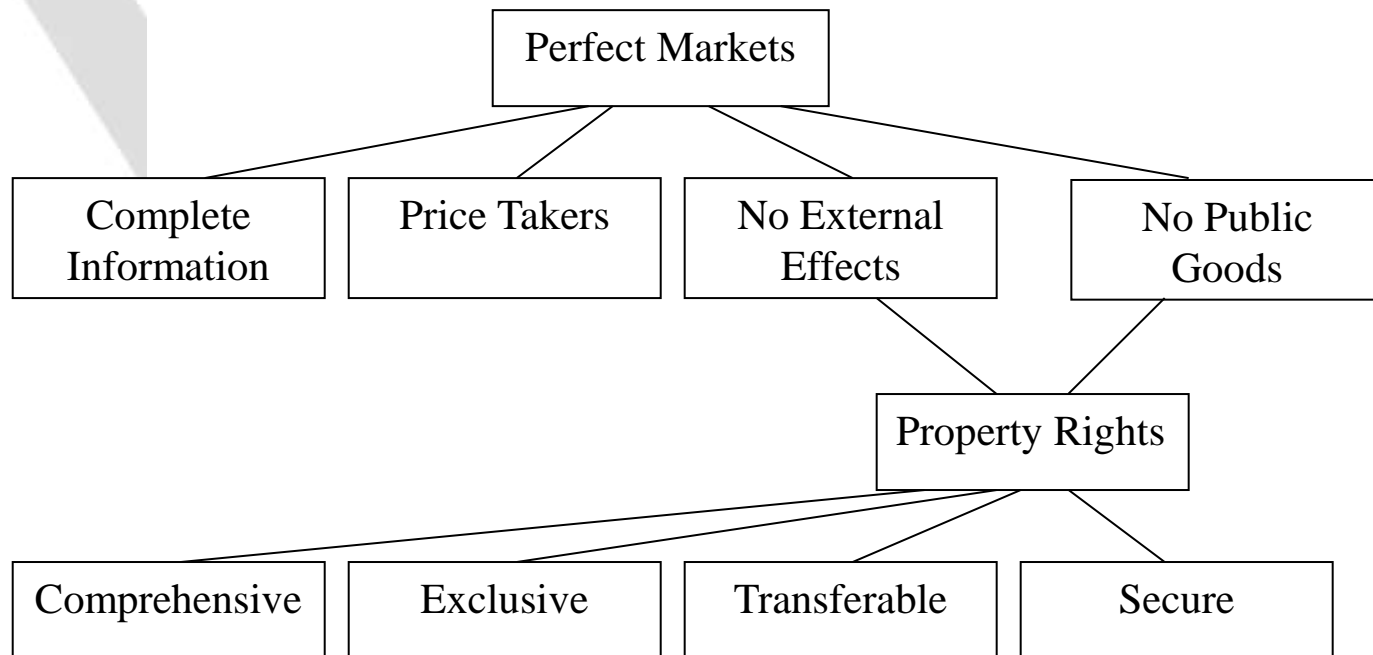
Pareto and Kaldor-Hicks

Pareto Criterion (again): A change is welfare-improving if at least one person is made better off and nobody is made worse off

In practice: a ‘straightjacket’ for public policy – almost no intervention would not make at least one person **worse** off

Thus, Kaldor-Hicks Criterion: A change is welfare-improving if those who gain from the change could (in principle) fully compensate those who lose, with at least one of the beneficiaries still being better off.

Why is CBA Particularly Important for Environmental Issues (1)



Why is CBA Particularly Important for Environmental Issues (2)

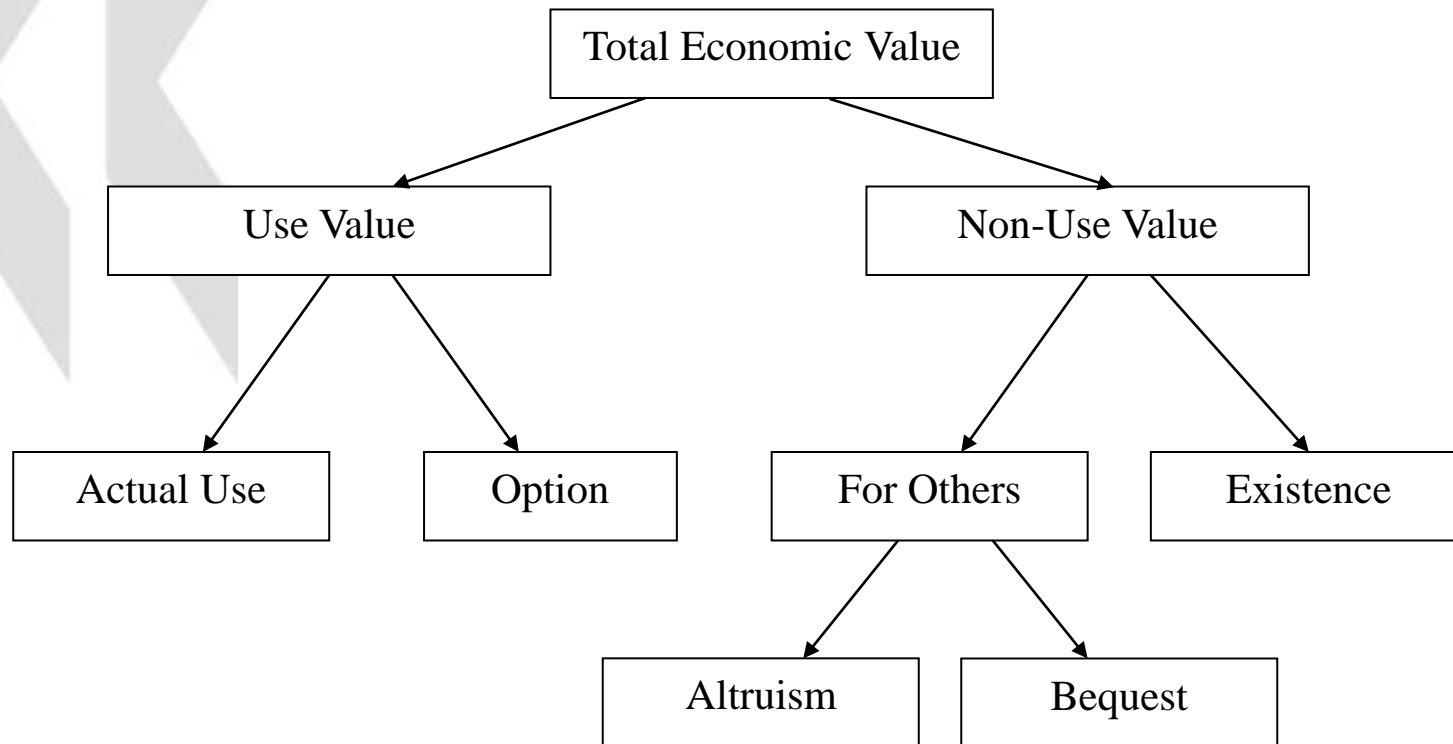
With respect to environmental resources property rights are only rarely comprehensive, exclusive or secure

They are (at least partly) ‘public’ goods – i.e. non-excludable and non-rivalrous, conditions which generate externalities between different people, firms, generations, etc., and thus gap between private and social costs

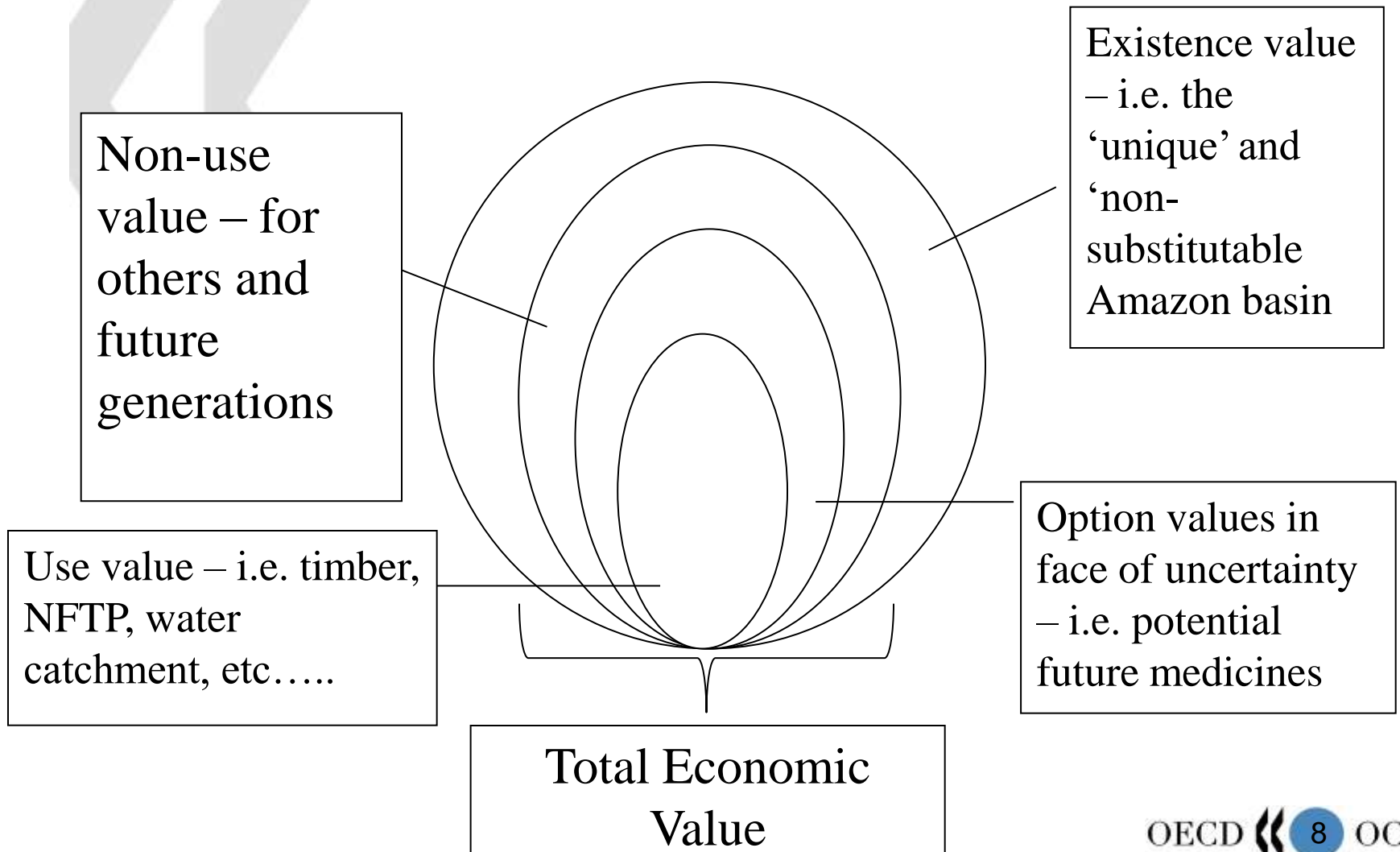
Implications:

- misallocation of resources in the economy
- too much pollution and too much resource exploitation
- Things which we ‘value’ have no (or wrong) price in the market. Need to determine true value so that benefits of policy interventions can be compared with costs in a commensurable manner.

The Benefits Side: Total Economic Value



The Benefits Side: A Tropical Forest



How to value (1)

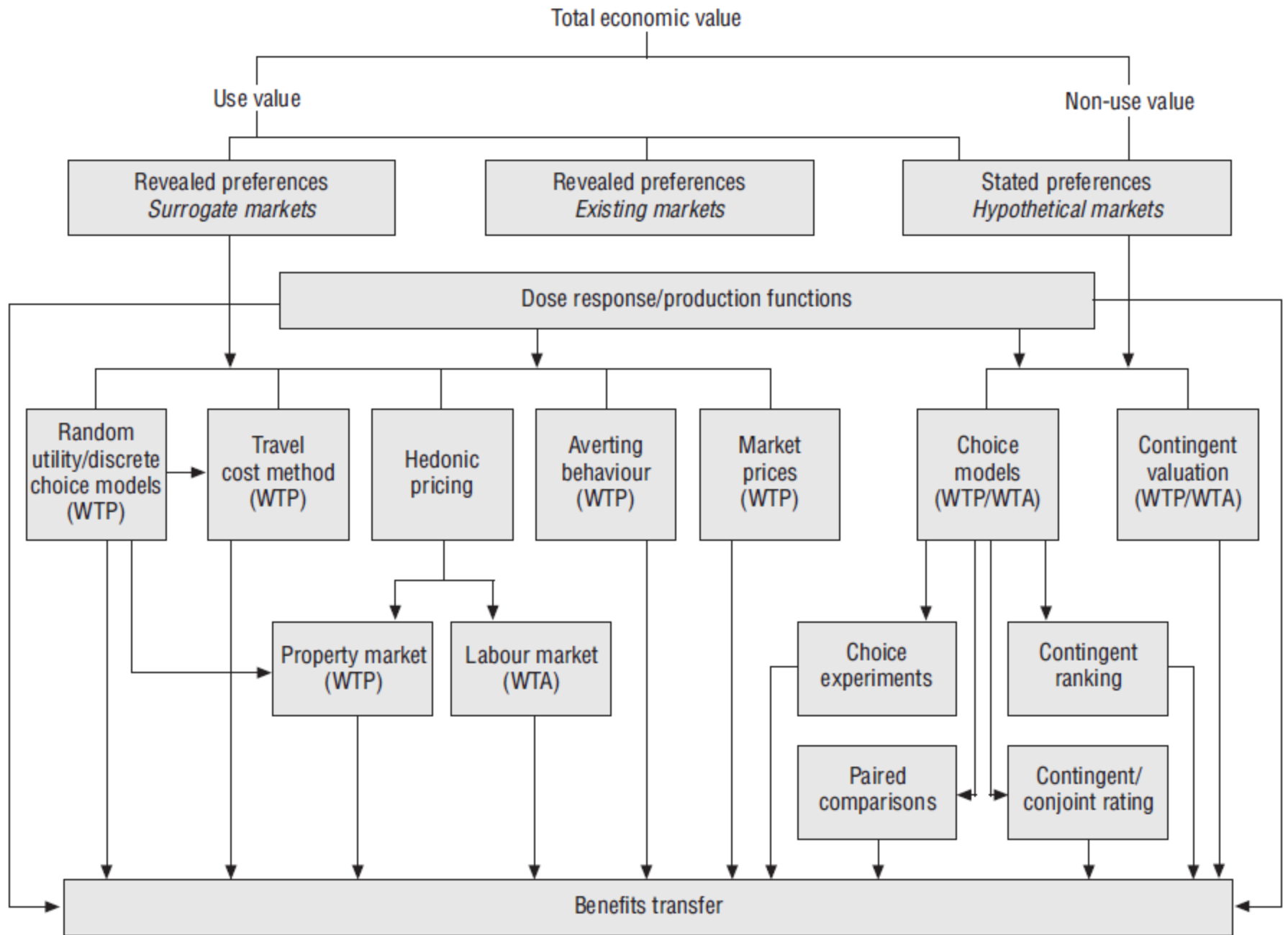
Revealed Preferences

- Indirect
- Actual Markets

Stated Preferences

- Direct
- Hypothetical Markets

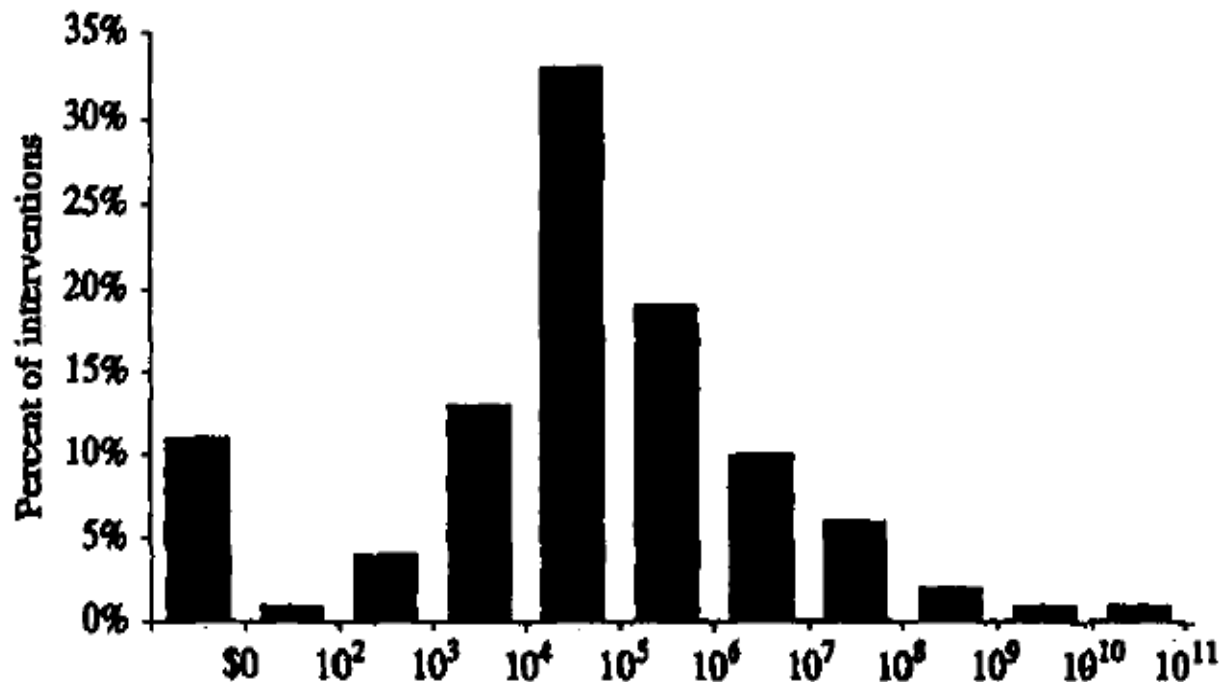
In both cases – estimation of what one would give up for an improvement in environmental conditions (WTP) or accept for a deterioration in environmental conditions (WTA)



Source: Pearce et al. (2008)

Benefits of Valuation

(Variation in Cost of Life Year Saved (\$1993) under US Health, Product Safety, Worker Safety and Environmental Regulations)



What do Policymakers do with the Values?

Compare with the costs and determine if a particular proposed policy intervention is welfare-improving => cost-benefit analysis

However – naïve view of actual policymaking. Relatively few ‘formal’ CBAs undertaken, and even fewer are the primary input into policy decisions

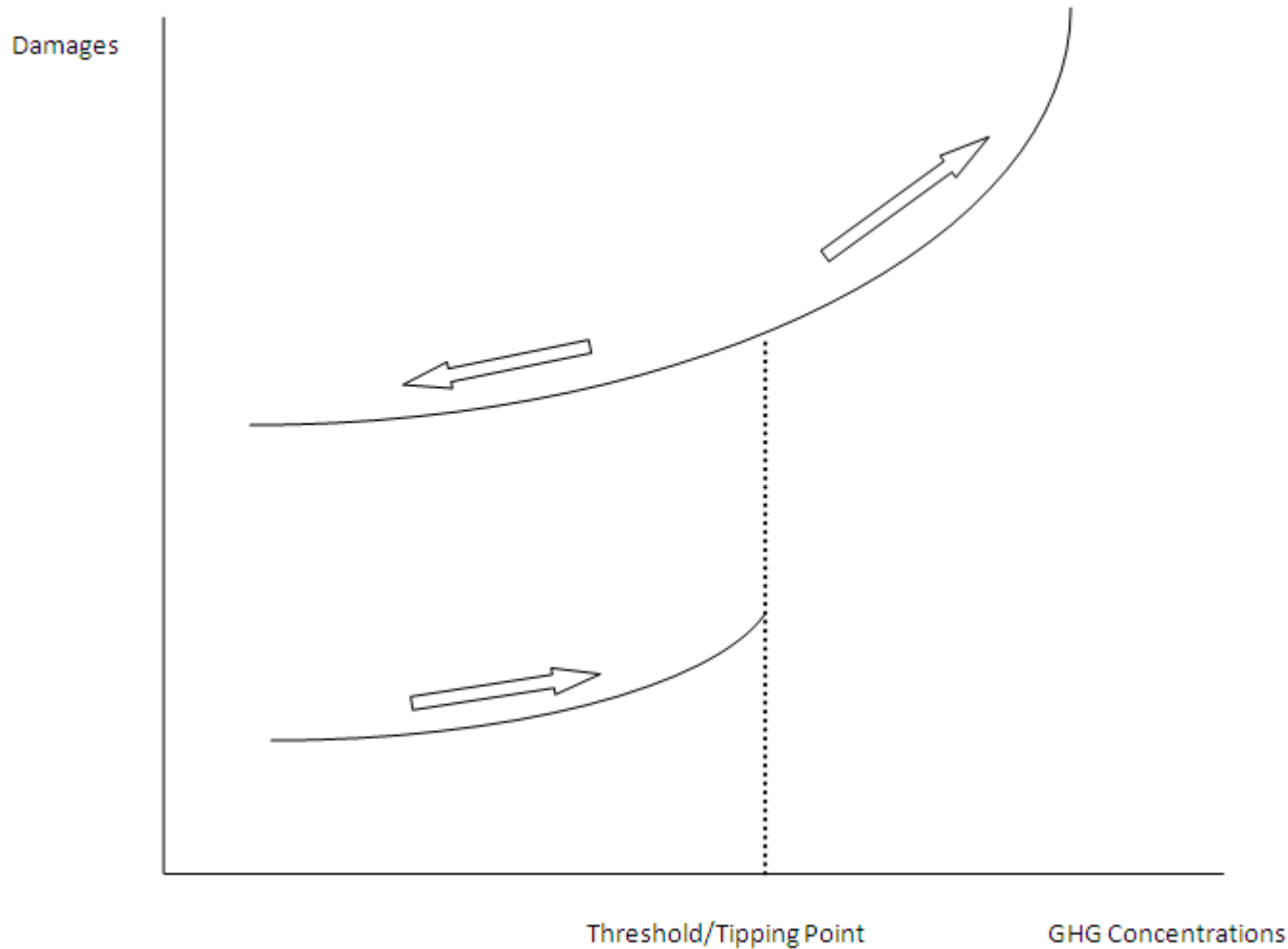
CBA is only one input into establishment of policy priorities. And for large (non-marginal) changes it is not sufficient or even always appropriate

Irrespective – the degree of ex ante uncertainty is so great that ex post evaluations of the actual benefits and costs of policies are vitally important

Concerns with Monetising Changes in Environmental Conditions and Their Use in CBA

- Ethical concerns – anthropocentric view of benefits (inherent to welfare theory); pricing what is priceless (i.e. ‘life’ or ‘unique’ assets); interpersonal comparisons are subsumed;
- WTA do not equal WTP for equivalent (but opposite) changes – Hicks and endowment effects, WTA is unbounded and WTP is bounded by income, perceived ‘rights’ to the status quo;
- Scale issues – can only be used to ‘value’ marginal changes – i.e. Costanza et al.’s (1997) estimate of the value of the world’s ecosystems - \$33 trillion. Toman (1998): ‘a serious underestimate of infinity’; and,
- Catastrophic, potentially irreversible and fundamentally uncertain outcomes (i.e. « Black Swans » – relevance of CBA is ‘qualified’ (Weitzman 2009))

An Example: Irreversibility & Thresholds



Examples of CBA (1): EU Bathing and Water Directives

Directive	Country	Costs	Benefits	Ratio
1976	Portugal	€12 M - €18 M	€845 M - €1025 M	62.0 : 1
1976	England and Wales	€4697 M - €4705 M	€8338 M - €16765 M	2.7 : 1
1994 Revisions	England and Wales	€5306 M - €12732 M	€14993 M - € 22646 M	2.1 : 1
2000 Revisions	England and Wales	€4998 M - €7676 M	€ 1744 M - € 3038 M	0.4 : 1

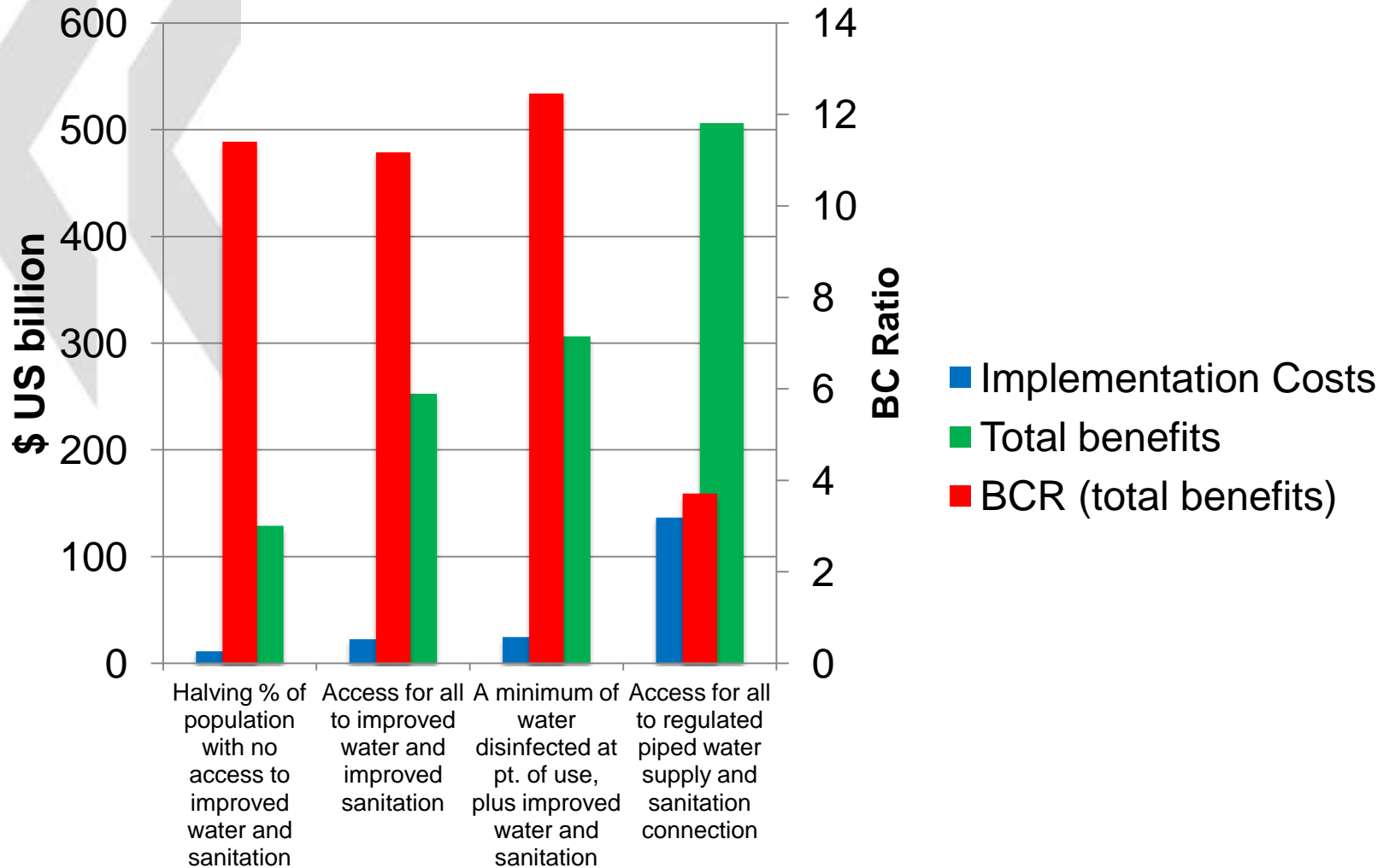
Source: Pearce (2000) in World Economics, Vol. 5, No. 3

Examples of CBA (2): Selected Air Pollution Regulations

Study	Country	Policy	Benefits	Costs	BCR
AEA Technology (2005)	Europe	Current CAFE strategy	EUR 42-135 billion	EUR 7.1 billion	6.0 – 19.0
Pandey and Nathwani (2003)	Canada	Reduce PM & O3 concentrations	CAD 7,552 million	CAD 2,491 million	3.00
USEPA (1999)	US	Reduce PM10, PM2.5, NO _x , SO ₂ , CO and VOC emissions	2000: USD 71 billion	2000: USD 19 billion	4.00
			2010: USD 110 billion	2010: USD 27 billion	4.00
Voorhees <i>et al.</i> (2000)	Japan	NO _x control interventions begun in 1973	USD 14,018 million	USD 2,330 million	6.00
MFE (2004)	New Zealand	Introduce Proposed Ambient Emission Standards	NZD 420 million	NZD 111 million	3.87

Source: OECD Costs of Inaction (2007)

Examples of CBA (3): Millenium Development Goals for Water and Sanitation



Source: Hutton and Haller (2004)