

The cost of inaction: why cost-benefit analysis seldom settles arguments

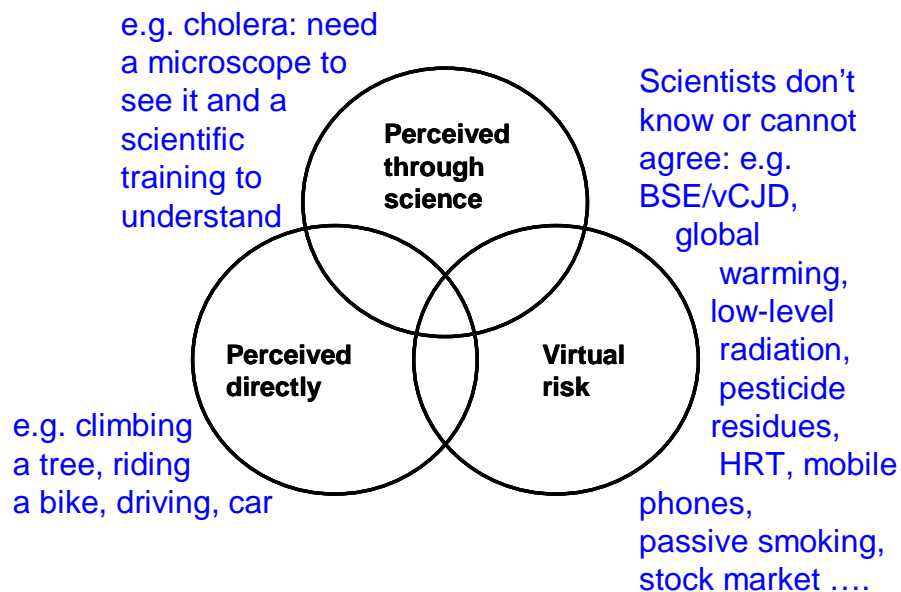
Contemplation of the *costs* of inaction usually provokes questions about the *benefits* of inaction, which leads to cost-benefit analysis. Cost-benefit analysis, as a method for settling arguments about action or inaction is enormously seductive. You simply add up the benefits of doing something and subtract the costs and if the result is positive you have a case for doing it. What could be wrong with that? In practice quite a lot.

1. Uncertainty

The benefits and costs of any proposed action or inaction are uncertain. They lie in the future and the future is inescapably subjective; it exists only in the imagination. Figure 1 presents a typology of risks or uncertainties with which cost-benefit analysts must struggle.

Figure 1

Different kinds of Risk



Source: Adams, J 1999, [Risky Business](#), Adams Smith Institute

Whether a decision about action or inaction is about crossing the street, licensing a new drug or granting planning consent for a mobile phone mast, it involves a judgement in the face of uncertainty. Before the analyst attempts to attach a value to the costs or benefits of any course of (in)action he must reach a judgement about its likelihood.

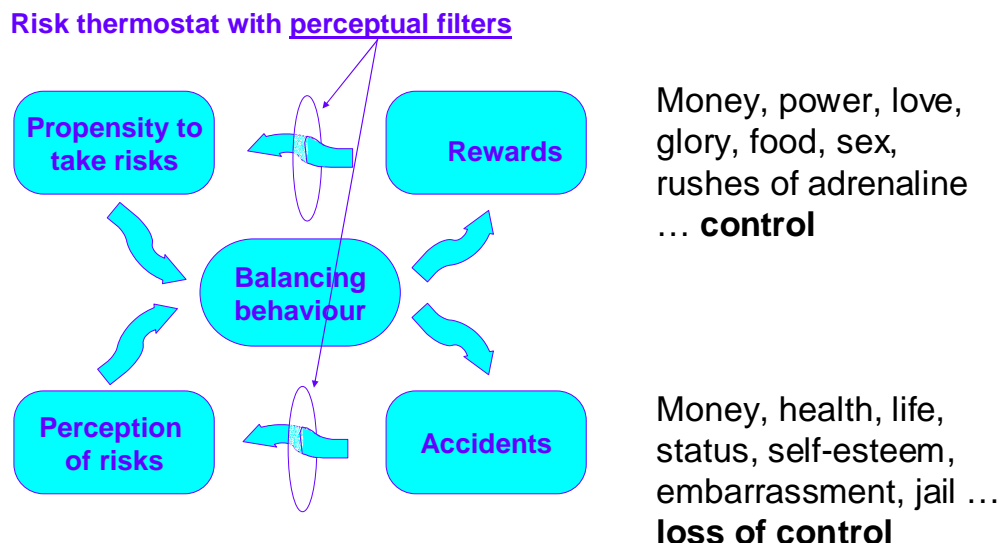
Potential costs and benefits in the directly perceptible circle are managed using judgement, some combination of instinct, intuition and experience; we do not attempt a formal probabilistic risk assessment before crossing the road. Risks in the virtual circle

are also managed using judgement; if science cannot settle the issue we are forced to fall back on instinct, intuition and experience. But even in the scientific circle in which we can invoke numbers in the form of probabilities, judgement is still involved – is a one in a thousand chance of something good or bad happening a risk worth taking? It all depends.

2. Incommensurability

Compounding the problem of uncertainty is incommensurability. Figure 2 presents the decision-making process as a form of cost-benefit analysis without \$-signs. The model proposes that all risk managers have a risk thermostat. “Propensity to take risks” represents the setting of the thermostat. This propensity leads to risk taking “behaviour” which leads, by definition to “accidents”: to take a risk is to do something that has a probability of an adverse outcome. We acquire our “Perception of risk” by surviving accidents and learning from them, reading about them, seeing them on television, being warned by mother ...

Figure 2



The model proposes that when perception and propensity get out of balance there is a behavioural response that seeks to restore the balance. And why do we take risks? There are “Rewards”, and the magnitude of the reward influences propensity.¹

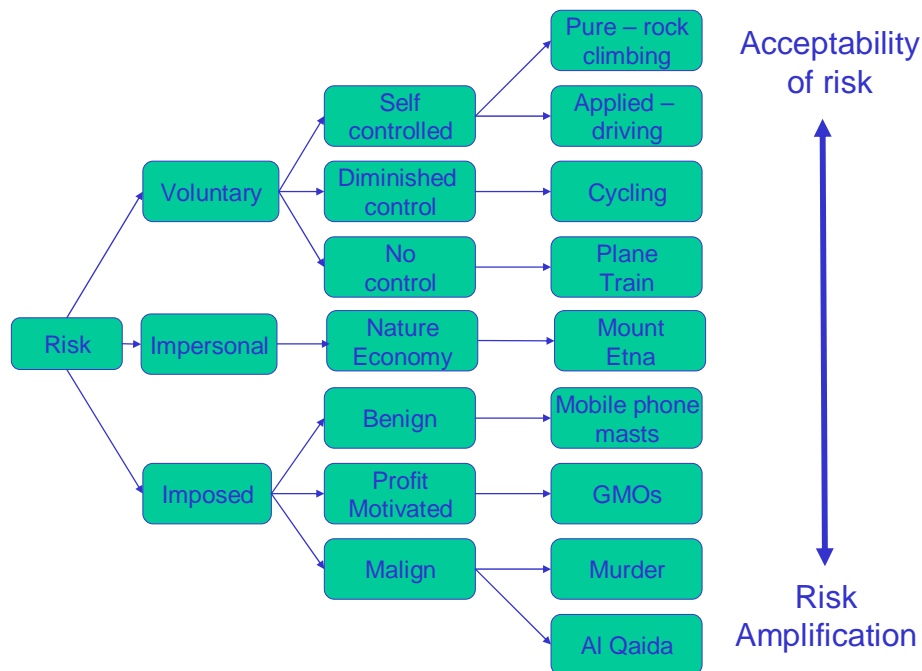
Conventional cost-benefit analysis requires that all significant contents of the rewards box (benefits) and the accidents box (costs) be reducible to cash. Certainly money can be an influential variable, but most policy decisions involve many other variables that cannot be converted into money. One that has proven highly influential is “control”; i.e. is the risk seen as voluntary or imposed, and is it under the control of the person or group experiencing the risk.

¹ This process is discussed at length in [Risk](#), J. Adams, 1995, UCL Press.

3. Voluntary versus involuntary

Figure 2 is equipped with perceptual filters to indicate that the contents of the Rewards box and the Accidents box are variably perceived, even when they come in the form of numbers produced by actuaries. Figure 3 suggests the way in which acceptance of a given actuarial level of risk is likely to vary widely with the perceived level of control an individual can exercise over it and, in the case of imposed risks, with the perceived motives of the imposer.

With "pure" voluntary risks, the risk itself, with its associated challenge and rush of adrenaline, is the reward. Climbers on Mount Everest know that it is dangerous and willingly take the risk. With a voluntary, self-controlled, applied risk, such as driving, the reward is getting expeditiously from A to B. But the sense of control that drivers have over their fates appears to encourage a high level of tolerance of the risks involved. Cycling from A to B (I write as a London cyclist) is done with a diminished sense of control over one's fate. This sense is supported by statistics that show that per kilometre travelled a cyclist is 14 times more likely to die than someone in a car. This is a good example of the importance of distinguishing between relative and absolute risk. Although Figure 3



Source: J. Adams, 2005, [What kills you matters](#), Social Affairs Unit

14 times greater, the absolute risk of cycling is still small - 1 fatality in 25 million kilometres cycled; not even Lance Armstrong can begin to cover that distance in a lifetime of cycling. And numerous studies have demonstrated that the extra relative risk is more than offset by the health benefits of regular cycling; regular cyclists live longer.

While people may voluntarily board planes, buses and trains, the popular reaction to crashes in which passengers are passive victims, suggests that the public demand a

higher standard of safety in circumstances in which people voluntarily hand over control of their safety to pilots or train drivers.

Risks imposed by nature - such as those endured by those living on the San Andreas Fault or the slopes of Mount Etna - or impersonal economic forces - such as the vicissitudes of the global economy and current "credit crunch" - are placed in the middle of the scale. Reactions vary widely. They are usually seen as motiveless and responded to fatalistically - unless or until the threat appears imminent.

Imposed risks are less tolerated. Consider mobile phones. The risk associated with the handsets is either non-existent or very small.² The risk associated with the base stations, measured by radiation dose, unless one is up the mast with an ear to the transmitter, is orders of magnitude less. Yet all round the world billions are queuing up to take the voluntary handset risk, and almost all the opposition is focused on the base stations, which are seen by objectors as impositions. Because the radiation dose received from the handset increases with distance from the base station, to the extent that campaigns against the base stations are successful, they will increase the distance from the base station to the average handset, and thus the radiation dose. The base station risk, if it exists, might be labeled a benignly imposed risk; no one supposes that the phone company wishes to murder all those in the neighbourhood.

Less tolerated are risks whose imposers are perceived as motivated by profit or greed. In Europe, big biotech companies such as Monsanto are routinely denounced by their environmentalist opponents for being more concerned with profits than the welfare of the environment or the consumers of its products.

Less tolerated still are malignly imposed risks - crimes ranging from mugging to rape and murder. In most countries in the world the number of deaths on the road far exceeds the numbers of murders, but far more people are sent to jail for murder than for causing death by dangerous driving. In the United States in 2002 16,000 people were murdered - a statistic that evoked far more popular concern than the 42,000 killed on the road - but far less than the 25 killed by terrorists.

Which brings us to terrorism and Al Qaida. How do we account for the massive scale, world-wide, of the outpourings of grief and anger attaching to its victims, whose numbers are dwarfed by the those of other causes of violent death? On 7 July 2005 terrorist bombs killed 52 people, the equivalent of six days death on the road in Britain. But thousands of people do not gather every Sunday for a three minute silence in Trafalgar Square in memory of the previous week's road death toll.

4. WTP versus WTA

When cost-benefit analysis is invoked to settle a dispute about a proposed policy or project it is almost always the case that the beneficiaries of the proposal belong to a different group from those who will bear the costs. If they were one and the same then any disagreements with the group could probably be settled by an accountant.

² J. Adams, "[Compulsive Risk Assessment Psychosis: a modern mental illness](#)", *Social Affairs Unit*, 2005.

Valuing the benefits of a proposal is in principle, for the economist, a relatively straightforward affair; the market can often provide guidance about what people are willing to pay (WTP) for the electricity produced by a new power station, or the convenience of a new airport. But even here there are problems. Not every benefit is traded in the market place. In Britain at the time of writing a debate is raging about a proposed compulsory national ID card. In addition to uncertainty about the efficacy of such cards, questions have arisen about how much freedom citizens might be prepared to sacrifice for the benefit of more security.

But valuing the costs of proposed policies or projects is even more difficult. Here the economist must ascertain the sum of money that would compensate the losers for their losses (Willingness to Accept Compensation, or WTA). The judges of this amount must be the people suffering the losses; the economist cannot answer for them. The need to ascertain WTA values for the costs that would be imposed by proposed projects or policies has created an intractable problem. While WTP is constrained by ability to pay, WTA values are unconstrained. Most people will insist that no amount of money could compensate them for the loss of their life. But many will also insist that many other losses, ranging from serious injury to the loss of a cherished view, are inconsolable by cash; and it takes only one infinity to blow up a whole cost-benefit analysis. This problem has been known and discussed inconclusively for decades. To get round it cost-benefit analysts routinely resort to estimating losses using WTP values, thereby undervaluing the losses.

The definition of 'costs' and 'benefits' determines the choice of measure adopted. Table 1, based on an illustration originally used by Mishan in 1971³, shows the way in which the legal/moral context of a problem can transform a cost into a benefit, and vice versa. It represents the possible bargains that might be struck during a train journey on the Cost-Benefit Railway by two travellers sharing a compartment - a non-smoker and a smoker - depending on the rules of the railway company.

Under the permissive rule, which allows smoking, fresh air will be viewed by the nonsmoker as a benefit - a departure from the status quo for which he expects to have to pay. The amount that he might pay will depend on the strength of his distaste for smoky air, and what he can afford.

The amount that the smoker might accept to forego his rights might depend on the strength of his addiction or his income - or his compassion, the exercise of which would produce 'payment' in the form of moral satisfaction.

Under the restrictive rule, which forbids smoking without the agreement of fellow passengers, the smoker's willingness to pay will be influenced by his income and the strength of his addiction, and the non-smoker's willingness to accept, will be influenced by his aversion to smoky air and how badly he needs the money. While it is difficult to imagine a civilised smoker requiring an extortionate sum of money to forego his rights, it is possible to imagine a desperately ill asthmatic refusing a very large sum of money to maintain his air supply in a breathable state. In any event, only in exceptional circumstances are a person's WTA and WTP likely to be the same. And because WTP is

³ Mishan, E. (1971) *Cost-Benefit Analysis*. George Allen, London.

constrained by ability to pay, and WTA is unconstrainable, WTA will almost always be larger.

Table 1. The Cost-Benefit Railway: who pays whom?

	Smoker	Non-Smoker
Permissive Rule	Willingness to Accept compensation for foregoing the right to smoke	Willingness to Pay for the benefits of a smoke-free journey
Restrictive Rule	Willingness to Pay for the right to smoke	Willingness to Accept compensation for foregoing the right to fresh air

Source: J. Adams, 1994, [The role of cost-benefit analysis in environmental debates](#)

Figure 1-3 and Table 1 help to explain why the valuation problems encountered by cost-benefit analysts have resisted solution. The analysts have been trying to divine the values that *society* places on the particular costs and benefits at issue. But, to quote Margaret Thatcher, in debates about policies and projects, “There is no such thing as society”. There is no single set of societal values waiting to be uncovered by clever methods such as contingent valuation or revealed preference. The “society” or “public” whose values cost-benefit analyses purport to capture is, in reality, divided.

Mishan’s metaphorical railway can be further elaborated. In Table 2 “Permissive rule” and “restrictive rule” have been replaced by “Inaction” and “Action”, the most basic choice confronting the policy maker or project proposer. But how should the columns be labelled? How might the responses of the various facets of society be represented?

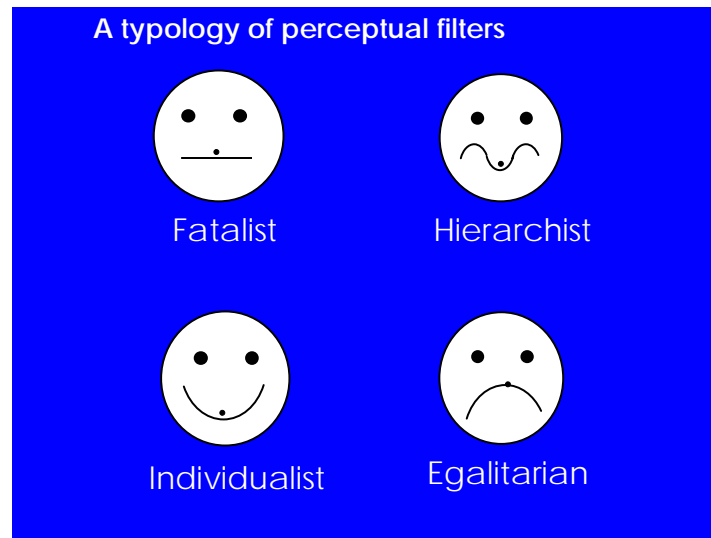
Table 2. Society chooses

	?	?
Inaction	Willingness to Accept compensation for the costs of Inaction	Willingness to Pay for the benefits Inaction
Action	Willingness to Pay for the benefits of Action	Willingness to Accept compensation for the costs of Action

In Figure 2 the Risk Thermostat is equipped with “perceptual filters” to suggest that risk managers (members of society) vary in the way in which they perceive (value) the potential “rewards” (benefits) and “accidents” (costs) of any contemplated action.

Figure 4 is a cartoon version of a typology of perceptual filters presented in a report for Britain’s Health and Safety Executive ([Taking account of Societal Concerns about Risk: framing the problem](#), J. Adams and M. Thompson, 2002)

Figure 4



In this report we confronted the HSE with the fact that, in terms of the typology, they were statutory Hierarchists: they make the rules and enforce the rules aimed at promoting health and safety at work. We also warned them that for the foreseeable future they could expect to be attacked by Egalitarians (e.g. environmentalists and the Consumers Association) complaining that they are not doing enough to protect society, and by Individualists (big business) complaining that they are over-regulating and suffocating enterprise.

With the exception of the fatalists, who are fatalistic because they feel powerless to influence the risks to which they are subjected, these actors can be found actively involved in most debates about health, safety and the environment. They have diametrically opposed definitions of the precautionary principle. The Egalitarian/environmentalist argues that if you can't prove it's safe assume it's dangerous. Nature, they insist, should be obeyed and respected and interfered with as little as possible. The Individualist argues that if you can't prove it's dangerous assume it's safe, and that one's best defence in an uncertain world is to be rich and powerful and have as much control over nature as possible. They also attach different meanings to "action" and "inaction". In the debate about GM for example, the Individualists favour action that promotes research and development and its application, and the Individualists campaign for action that will impede it. Both favour *action*, and lobby the Hierarchy to implement their version of it.

5. The UK's Chief Scientific Adviser

Sir David King, The UK Government's Chief Scientific Adviser, can serve as an exemplar of the Hierarchist's dilemma. In [a farewell speech](#) - he is about to leave his job - he clearly felt free to speak his mind. He addressed two topical concerns: GM crops and global warming. On GM he was pro, and incurred the wrath of environmentalists; the Friends of the Earth's GM campaigner replied - "the main benefits they have brought are to the handful of multinational companies who have gained an increased control of the

food system and have disempowered small farmers all over the world, especially in developing countries."

On Global warming he was on their side: "climate change is a far greater threat to the world than international terrorism."

Cost-benefit analysis has little to contribute to either debate. Imagine a researcher armed with a contingent valuation questionnaire approaching Lord Melchett of the Soil Association. He was interrogated by a Parliamentary Committee inquiring into the costs and benefits of GM. This is the key part of the exchange.

Lord Reay (Chairman)

Your opposition to the release of GMOs, that is an absolute and definite opposition? It is not one that is dependent on further scientific research or improved procedures being developed or any satisfaction you might get with regard to the safety or otherwise in future?

(*Lord Melchett*) It is a permanent and definite and complete opposition based on a view that there will always be major uncertainties. It is the nature of the technology, indeed it is the nature of science, that there will not be any absolute proof. No scientist would sit before your Lordships and claim that if they were a scientist at all.

House of Lords Select Committee on GM Crops, Minutes of Evidence,
3 June 1998

There is no prospect that attaching \$-signs to the concerns of the participants in this debate can resolve the matter.

6. The World Health Organisation

The role of the WHO is analogous to that of the UK's Chief Scientific Adviser, albeit with a larger staff and on a global scale: amongst [its responsibilities](#) are "shaping the health research agenda, setting norms and standards, articulating evidence-based policy options ... and monitoring and assessing health trends." Conventional cost-benefit analysis is unlikely to assist in the execution of these responsibilities. The global span of its operations greatly increases the number of contending value systems demanding representation at the negotiating table.

Attempts to apply CBA to the problem of global warming have been a conspicuous failure. The uncertainty that still hangs over the science and potential impacts of the climatology involved have provided ample scope for a clash of values. This clash was greatly aggravated a few years ago by the attempts of economists to value in money terms the impacts of climate change, including loss of life⁴. They got round the problems associated with valuing loss of life in terms of WTA by treating the value of lives that might be saved by policies that would prevent global warming as a benefit for which people should be expected to pay. Thus, using WTP values the study concluded that the

⁴ Pearce, D, Cline, W.R., Achanta, A.N., Fankhauser, S., Pachaurie, R.K., Tol, R.S.J. & Vellinga, P. (1994) The Social Costs of Climate Change: Greenhouse Damage and the Benefits of Control, 3rd Draft of paper for IPCC Working Group 3, September.

lives of people living in the richest nations of the world were worth fifteen times more than the lives of the poorest. This factor of fifteen was almost certainly an embarrassment-driven compromise; the poorest people in Bangladesh can afford nothing. Needless to say the offence caused by the presentation of these calculations in international forums did little to assist the building of a consensus.

The debate going on in Bali at the time of writing over the distribution of the costs and benefits of potential global-warming-limiting policies will not be resolved by attempts to monetize them.

The cost of inaction, the title of this workshop, implies the existence of a set of problems within WHO's sphere of responsibility in which conventional methods of economic evaluation will be able to convince those responsible for taking action that the benefits of action will outweigh the costs. I have my doubts.

The debate about cost-benefit analysis: a personal history

The above is a highly condensed version of a debate about the (f)utility of CBA in which I have been engaged since 1970. With the help of my webmaster (my daughter Laura) I have placed some of my contributions on my website.

1970 [Westminster: The Fourth London Airport?](#)
Area, Institute of British Geographers, No.2

1971 [London's Third Airport: From TLA to Airstrip One](#)
The Geographical Journal, Vol. 137, No. 4 (Dec., 1971), pp. 468-493

1989 [London's Green Spaces: What are They Worth?](#)
Report for London Wildlife Trust and Friends of the Earth, September 1989

1991 [On being economical with the environment](#)
Global Ecology and Biogeography Letters (1991) 1. 161-163

1993 [Vogon Economics and the Hyperspatial Bypass](#), New Scientist

1994 [The Role of Cost-Benefit Analysis in Environmental Debates](#)
Report commissioned by Sir Crispin Tickell for British Government Panel on Sustainable Development

1999 [Risk-Benefit Analysis: Who Wants It? Who Needs It?](#)
Paper for Cost-Benefit Analysis Conference
Yale University, 8-10 October