



Economics in policy-making 2

How economics is used in government decision-making

The UK Treasury specifies that “all new policies, programmes and projects should be subject to comprehensive assessment”. There are a range of different approaches (economic and otherwise) that governments take towards this, but one economic tool in particular – cost-benefit analysis (CBA) – has come to occupy centre stage.

This briefing looks at how economics is used in decision-making and the problems with this, both in theory and in practice.

How is economics currently used in decision-making?

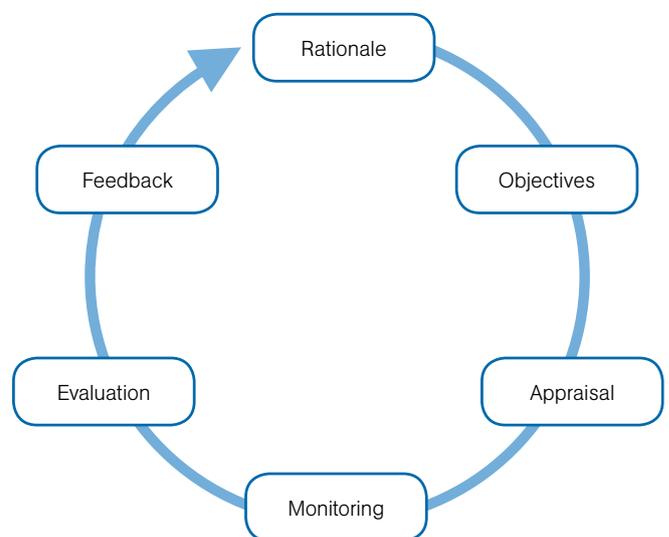
The diagram on the right shows the cycle of activities generally involved in government policy-making¹. Let's start by looking at where economics fits into this process.

Rationale

Accountable governments must give reasons for doing things. As outlined in the previous briefing, the two main government justifications given for intervention in a capitalist economy are:

- 1 To address market failures in order to promote efficiency
- 2 To distribute wealth (or equity) more evenly

As an important note regarding justification 1, many argue that market failures (e.g. the 2008 banking crisis or climate change) have become so endemic that they are now the norm rather than the exception. It is therefore questionable whether thinking about (and



targeting) market failures on an individual basis is a valid way for a government to tackle the systemic problems we face.

Appraisal

Once a government has decided to take action, and has established its key objectives in doing so, it should carry out a careful appraisal of its options for meeting these objectives.

A good appraisal should question the following:

- How will each option change things, by how much and for how long?

Let's say, for instance that – in order to conserve seabed habitats – a particular type of fishing gear was to be banned from a certain area. Before introducing such regulation, a government would want to understand how firms and people might respond to this change, including how they might distort their behaviour in order to get around or avoid the regulation. In doing so, it would need to take risk and uncertainty about the future into account.

There are a range of tools that economists use to make these sorts of predictions including modelling (known as microsimulation), looking at demand schedules, forecasting, and examining data from similar changes across different times and space.

- What is the value of each option?

This is the part that often gets the most attention and is what usually comes to mind when people think of economic analysis.

A common approach to valuing policy options is cost–benefit analysis (CBA). This basically involves putting a financial value on all of the costs and benefits of an intervention, and weighing them up. It should take into account not just those costs and benefits that have a actual market value, but also the action's wider social and environmental outcomes that do not.

In reality, the type of appraisal that holds the most sway is the regulatory impact assessment (RIA), which has been a key tool in helping 'improve' the quality of regulation and 'reduce unnecessary burdens' on business.

Evaluation

This has some similarities with the appraisal phase except that it happens during and at the end of a project, rather than before.

Economic evaluations generally focus on the counterfactual – or, put simply, what *would have happened* had the action not been taken.

Working this out is usually very difficult. Changes happen for complicated reasons, making it hard to pinpoint the effects of individual policies or procedures. Nevertheless, a range of complex econometric tools, with technical names like 'regression', 'difference in difference', and 'instrumental variables' have been developed to help unpick the causes of change.

The 'experimental approach' towards carrying out projects and policies is also becoming more common (see The Cabinet Office's recent paper for more information²). Whilst laudable in theory, it is hard to find evaluations of government projects that have used this approach successfully.

What are the problems with relying on an economics approach to decision-making?

As we have seen, economics enters several stages of the decision-making process. In practise, however, the appraisal stage is where it really makes waves – usually in the guise of economic cost–benefit analysis.

Whilst it may seem sensible to count the costs and benefits of a course of action, there are a range of problems to consider:

- 1 Problems with price:** UK Treasury guidance states that CBAs should take account of wider social and environmental outcomes. Unfortunately, many CBAs are terrible at doing this in reality. Even when they do, the very process of converting everything to one metric (i.e. monetary price) throws up various ethical questions and mixes up renewable and non-renewable resources. (See *briefing 3 on valuing the environment*.)
- 2 Failure to consider equity:** Whilst the Green Book (guidance that should be used for appraising any government spending) states that appraisers must 'identify how the costs and benefits accrue to different groups', this is often not done in reality. If it is done, the results are rarely considered in the final decision.
- 3 Biased technical discussion about costs:** Some costs, such as the cost of regulation, are perennially over-estimated while others are under-estimated. The miscalculation of costs is not always caused by human error, but is often the result of lobbying by analysts with vested interests in certain outcomes. As Ackerman shows, the nature of such discussion is often secretive, and can serve to disenfranchise the public from participating in important political debates.³
- 4 Risk and uncertainty:** Particular difficulties with predictions or assessment apply to projects where there is risk or uncertainty. Valavanis describes economic statistical tools like an 'exquisitely balanced French recipe' which sets out in detail methods to use for preparation. The problem arises because the right ingredients are not available and prestige in the profession rests on technical expertise rather than on the hard work required to collect data about the world that is useful.⁴ The point here is that analysts often spend a lot of time calculating minute details, but have such little information about the important parts of their work that it is of questionable use.

The economic approach used in decision-making does not adequately cover environmental tipping points (large non-linear irreversible change e.g. the melting of the Greenland ice sheet or shifting of the north Atlantic conveyor).
- 5 Decisions presented as being objective, when really they are subjective.** Numbers often give the impression of being factual and objective, but in reality models are made up of assumptions and subjective

decisions. For example, it is a subjective decision to set the UK discount rate (the rate at which we 'mark down' the value of future costs and benefits – see briefing 5) at 3.5%.

6 Lack of democracy: Although economic appraisals are supposed to consider the course of action that is best for the jurisdiction in question, in reality the groups that have a larger voice, such as those who are actually completing or commissioning the analysis, often have a bigger say. We go onto this in more detail below.

How is economics really used in decision-making?

In reality economics is rarely used in decision-making in the way the HM Treasury guidance recommends. It is impossible to disentangle politics from decision-making for a variety of reasons – some of which are clearly unavoidable if decisions need to be taken fast, or if voters challenge an unpopular decision.

In other cases, economic models are susceptible to being manipulated by vested interests. They can be commissioned with the set purpose to justify a decision that has already been made, rather than a genuine appraisal of the options. A politician or lobby may have a favoured policy or project and then commission economic analysis as little more than publicity to back up their case. (The recent HS2 rail proposal is a good example of a foregone conclusion being justified retrospectively.)

Even when a decision hasn't already been made, there are often systematic biases which mean some stakeholders are given more weight than others in economic analysis. As the environment and future generations aren't able to attend consultation events, and don't sit in anyone's constituency, they are often not counted in decision-making.

Summary: getting behind the model

We've seen there are some serious problems with the economic approaches used in decision-making, both in theory and practice. This isn't improved by inaccessible language and the methodology tucked away in technical appendices. For this reason it is often difficult for non-economists and the public to engage in debates and to identify misguided economic arguments.

Challenging the analysis

We hope these briefings will equip you to be able to identify weak rationale and challenge bad decision-making.

A few hints or questions to ask:

- Who wrote the report and conducted the analysis, and why? Be particularly wary of reports commissioned by lobby groups, or even commissioned by government, if it looks like a decision has already been made and only one option is being appraised.
- Don't be put off by lots of spreadsheets and technical appendices. Just because a report has lots of numbers and lots of valuations doesn't mean it's any good. Question its authors on whether they have any evidence or data from the real world, how they have assessed risk and uncertainty, and how they have assessed what would happen without the change.
- Look in detail at what costs and what benefits have been given a value and more specifically who (in terms of groups of people now, as well as the environment and future generations) is included.

Further reading and useful resources

The Green Book: The Green Book sets out a framework for the appraisal and evaluation of all policies, programmes and projects.

The Magenta Book: The Magenta Book builds on themes in the Green Book with more detailed guidance on evaluation. It's recommended for use by all policy makers, including in local government, charities and the voluntary sectors

The Marine Socio-Economics Project (MSEP) is a project funded by The Tubney Charitable Trust and coordinated by nef in partnership with the WWF, MCS, RSPB and The Wildlife Trusts.

The project aims to build socio-economic capacity and cooperation between NGOs and aid their engagement with all sectors using the marine environment.

CASE STUDY

Any economic analysis informing policy-making needs to take environmental and social impacts into account. An example of the application of economic tools used to inform decision-making is outlined below. In this case study the full cost benefit analysis (CBA) used in the Marine Conservation Zone (MCZ) provisions of the Marine and Coastal Access Act (MCAA), 2009 is described.⁵ All data and information has been extracted and adapted from a 2010 draft report by Eftec.⁶

The Marine Conservation Zone (MCZ) provisions section in the UK Marine and Coastal Access Bill, the associated [Impact Assessment](#) (a requirement for any government intervention) and also several supporting documents were used by Defra to conduct a full CBA to assess the economic impact of a network of MCZs around the UK.^{7,8}

What did Defra do?

Defra conducted a full CBA to compare costs of setting up a network of MCZs with the costs of not doing so (i.e. the 'counterfactual') and to assess the economic impact of setting up the MCZ network. The analysis was at national rather than individual site level.

Which methods did Defra use?

- CBA based on 'benefit transfer' (using data / information from a similar region or context).
- Expert opinion on proportion of current service levels provided in future under different scenarios.
- Cost calculations based on predicted management costs and opportunity costs based on present activity levels.
- Contingent valuation (CV) survey for non-use values (by asking people about their willingness to pay (WTP) based on specific scenarios).

What costs and benefits were looked at?

Costs – Could these have been over-estimated? (see point 3 on page 3).

- Costs to government for implementing and maintaining the network as well as the costs to business from restrictions on activity (i.e. opportunity costs) through MCZ management measures. Separately estimated by ABPMer (2007).
- Impact assessment gives £20–£24 million for the one-off transitional costs, and £42–£82 million per annum on-going costs, total £752–£1556 million present value,

Benefits – What about the benefits without a market price? (see point 1 on page 3).

- £753–£1654 million per annum average annual benefit estimate, depending on scenario. More restrictive protection results in higher values.
- £8.6–£19.6 billion total estimate of present value of benefits, depending on scenario. More restrictive protection results higher values.
- £487–£1200 million per annum/£6.9–£16.6 billion present value (PV) estimated non-use value of protecting marine environment – but this is not included in CBA figures.

The study also identified 11 **ecosystem service impacts** and attempted to value seven of these:

- 1 Food and raw materials based on market values.
- 2 Recreation on expenditure.
- 3 Nutrient cycling (using [Costanza et al.](#) per ha figure).⁹
- 4 Climate regulation on primary productivity and UK carbon value.
- 5 Sea defence on avoided costs.
- 6 Cognitive values on value added (research spending) and expenditure (education) with a specific marine focus.
- 7 Additional carbon savings (not related to the ecosystem services) are also considered.

Benefit estimates made for seven of eleven ecosystem service impacts were identified.

Categories which were omitted: resilience and resistance, biologically mediated habitat, bioremediation of waste, and cultural heritage and identity.

Off-site benefits, notably for fisheries, were not included. A tentative estimate of £16.8 million per annum for fisheries via production function model was provided.

CASE STUDY

Non-use values for conservation were also omitted. A separate study (McVittie and Moran 2008) used CV and CE (Cost effectiveness) methods to explore this and estimated £6.9–16.6 billion present value over 20 years; they stress that this may include some use component and to avoid double counting might be used in place of the ecosystem service values presented here.

How were some of the benefits valued?

A separate stated preference (SP) survey was carried out for non-use values, but those were not treated as additional in order to avoid possible double counting. The non-use values were held 'in reserve' as a further argument for the robustness of positive benefit cost ratios (BCRs) – i.e. arguing the case for conservation based only on use values, while pointing out that additional values will exist.

What time horizon and discount rate were used?

(The issue of discounting is discussed further in case study for briefing 5.)

The time horizon was 20 years and a 3.5% discount rate (a standard requirement for all CBA done for public interventions in the UK) was used.

What was the final CBA result (in terms of benefit-to-cost ratio)?

- The study suggests that active conservation of the UK marine habitat has a positive net present value, estimating that establishment of a network of MCZs throughout UK waters has a **positive BCR of between 6.7 and 38.9**.¹⁰
- Although this is an imprecise conclusion based on far from perfect evidence about benefits, the results are reasonably robust in the sense that sensitivity testing shows that even given the uncertainty in the estimates, it is rather unlikely that the BCR could be below 1.

What was the net present value (NPV) estimate?

NPV best estimate:

- Range of £7.9 billion to £18.0 billion, mid-estimate £13.0 billion
- Worst-case: range £3.584 billion–£8.240 billion, mid-estimate: £5.9 billion
- Best-case: range £9.651 billion–£21.293 billion, mid-estimate: £15.5 billion

The study is a good illustration of the use of expert judgement to score likely impacts where we have some evidence of the total value of a service, but limited evidence of the impact on that service of a specific policy change. This kind of uncertainty is quite common in studies relating to conservation decisions, and there are different approaches to it. Some studies would include the scientific uncertainty in the valuation study, using stated preference studies of willingness to pay (WTP) for conservation actions or results without actually modelling the ecological relationships.

What does the narrative say?

'A combined area of 37760 km will be protected by designation of MCZs and over 1000 features (habitats, species, and geological and geomorphologic features) will be conserved. This is likely to result in increase in final ecosystem services (benefits) such as increase in provisioning, regulating and cultural (and recreational) services. Many people will gain satisfaction (non-use value) that rare representative marine features are being protected for current and future generations.'

Assumptions: Relationships are assumed to be linear (see point 4 on page 3). Only on-site effects are considered (conservative).

Uncertainties: There are numerous uncertainties around cost assumptions, valuation methods, expert judgement used in assessing the impacts, and attributing them to specific habitats, possible 'non-linear' nature of benefits.

Conclusions

As has been made clear, there is no perfect format for a CBA.

The full CBA conducted to inform the Impact Assessment for the UK Marine Bill with an assessment of the benefits and costs of the whole proposed MCZ network, provides an example of how CBA has been used to inform the decision on MCZs.

The same approach was used in the 2012 Impact Assessment consultation which can be seen here: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/82721/mcz-designate-ia-20121213.pdf

For more information about the UK government's approach to marine protected areas see: <https://www.gov.uk/marine-protected-areas>

The next briefing and case study look at how we value nature using economics.

Endnotes

- 1 The cycle we show is used in both the Green Book (guidance that should be used for appraising any government spending) and the Magenta Book (guidance on evaluating money already spent) http://www.hm-treasury.gov.uk/d/magenta_book_combined.pdf
- 2 Paper available at: http://webarchive.nationalarchives.gov.uk/+http://www.cabinetoffice.gov.uk/~media/assets/www.cabinetoffice.gov.uk/third_sector/assessing_impact_se_full%20pdf.ashx
- 3 Ackerman, F (2008) Critique of Cost-Benefit Analysis, and Alternative Approaches to Decision-Making - A report to Friends of the Earth England, Wales and Northern Ireland
- 4 Valavanis, S (1959) *Econometrics*. New York : McGraw-Hill cited in Kennedy, P (2003) *A Guide to Econometrics*, Blackwell Publishing.
- 5 Establishment of representative network of protected areas under Marine and Coastal Access Bill (Marine Bill) as presented in the Impact Assessment (IA) for the bill.
- 6 Eftec (2010) *benefits and costs of conserving biodiversity and ecosystem services*. for the European Commission, Directorate-General Environment, draft report, 2010.
- 7 Impact assessments (IAs) are required for government interventions http://www.hmtreasury.gov.uk/data_greenbook_impact_assessments.htm
- 8 (ABP Mer, 2007; McVittie *et al.*, 2008; Moran *et al.*, 2008; Hussain *et al.*, 2010;)
- 9 The value of the world's ecosystem services and natural capital Costanza *et al.*, 1997 http://www.esd.ornl.gov/benefits_conference/nature_paper.pdf
- 10 The study uses expert judgement to score likely impacts where we have some evidence of the total value of a service, but limited evidence of the impact on that service of a specific policy change. This kind of uncertainty is quite widespread and needs to be taken account of.

Economics in Policy-making briefings:

- 1 An overview of economics
Sagar Shah
- 2 How economics is used in government decision-making
Susan Steed
- 3 Valuing the environment in economic terms
Olivier Vardakoulias
- 4 Social CBA and SROI
Olivier Vardakoulias
- 5 Discounting and time preferences
Olivier Vardakoulias
- 6 Multi-criteria analysis
Olivier Vardakoulias
- 7 Beyond GDP: Valuing what matters and measuring natural capital
Saamah Abdallah
- 8 Markets, market failure, and regulation
James Meadway
- 9a Finance and money: the basics
Josh Ryan-Collins
- 9b What's wrong with our financial system?
Josh Ryan-Collins
- 10 Property rights and ownership models
James Meadway
- 11 Behavioural economics – dispelling the myths
Susan Steed

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