

Tools: Cost-Benefit Analysis

Cost-benefit analysis is an economic tool for supporting decisions on larger investments from a social, as opposed to a firm's, point of view. Its domain of application includes regulatory and technology choices. It has been developed as a tool to remediate a number of shortcomings of a purely market oriented analysis of costs and benefits. In a world with perfect markets, costs and benefits would indicate to any decision maker everything relevant for economic welfare. Markets are not perfect. Cost-benefit analysis repairs some of the deficiencies caused by these market imperfections. Three types of correction take place:

- for transfer payments, that is taxes and subsidies, which shift purchasing power but do not indicate welfare changes for the community as a whole;
- for price distortions, as created by monopolistic and oligopolistic markets
- for external effects and collective goods, which are not, or not adequately, expressed in market prices.

It is the latter type of effects which is of interest for environmental analysis. Most environmental problems can be seen as *external effects* of economic activities, like the costs of emissions which are not paid for to those damaged, or as *collective goods* which are not priced and hence overused, like fish from the oceans, wood from forests, and the beauty of a landscape.

In cost-benefit analysis, a first step is to specify the effects as related to the decision at hand. In the cost-benefit literature this step has not been worked out in much detail. Models may be restricted to more or less direct effects, may include indirect effects and may even take into account secondary effects involving macro-economic mechanisms.

Next to market related costs and benefits, a number of other effects are specified, including all relevant environmental effects. The main focus in the current development of cost-benefit analysis is on how to evaluate these unpriced effects. The dominant approach is based in Paretian welfare theory, where the individuals confronted with these external effects judge their importance. As in market choices, their preferences can be expressed in money terms. The overall evaluation then is in one single category: money, providing a comparable yardstick for the decision maker.

Cost-benefit analysis, contrary to the other tools for environmental decision support, can take the time horizon of effects into account. By discounting future costs and benefits, the more future effects are the less important they become. Often, in cost-benefit analysis an equilibrium situation is specified, as mostly is the case in, e.g., LCA, and discounting then is not possible.

Cost-benefit analysis and LCA can be integrated, applying the analysis to a (broadly defined) unit of function and setting up the LCA characterisation and evaluation in line with the Paretian approach: specifying damage functions and valuating the damages from the point of view of those concerned. Recent examples of integrating LCA and cost-benefit analysis are in assessing different options for energy production and for waste management.

Relevant literature

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