



Analysis

Project evaluation with democratic decision-making: What does cost–benefit analysis really measure?



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ABSTRACT

It is often argued that projects involving public good changes should be chosen on the basis of monetary valuation and cost–benefit analysis (CBA). However, CBA is not value-free. When used to measure welfare, it is based on highly controversial value judgements. When used to measure efficiency, it is based on assumptions of limited relevance to democratic decision-making processes. CBA measures total net willingness to pay, neither more nor less. While interesting in its own right, the normative significance of this indicator is not obvious.

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1. Introduction

Markets function poorly when it comes to provision of public goods, such as a stable global climate, air quality, biodiversity and many other ecosystem services. Securing a reasonable supply of such goods is thus an important task of government.

Economic analysis of potential public sector projects should, to the extent possible, contribute to decision-makers' understanding of what is at stake, regardless of whether consequences have market values. In environmental economics, a common approach to public project evaluation is thus to estimate people's willingness to pay for changed public good provision, use this as a measure of the social benefits of the environmental change at hand, and then compare these benefits to project costs and other social impacts through cost–benefit analysis (CBA). The resulting indicator is usually called the project's 'net benefits' or 'net present value', and is often interpreted as a measure of its social desirability.

Some scholars explicitly consider CBA as a tool for measuring a project's contribution to social welfare; others, while not necessarily

accepting the welfare interpretation, speak of it as a means to indicate projects' efficiency.¹ However, even for the efficiency interpretation, the theoretical rationale can be questioned.

CBA can be interpreted normatively or positively (Hammitt, 2013). In the present paper, I will discuss what CBA really measures. Turning first to the normative interpretation, I spell out some of the highly controversial ethical and/or political premises one implicitly accepts if using CBA as a normative guide. I next discuss the efficiency interpretation, arguing that it relies on assumptions that are rarely valid in democratic project evaluation processes. Finally, I briefly sketch an alternative approach to economic project analysis, based on the idea that the analyst's job is to convey and summarize relevant facts, pointing out the pros and cons, while final conclusions are determined (whether one likes it or not) through the democratic procedure at hand.²

Basically, what I want to argue is the following. As a tool for choosing between public projects, cost–benefit analysis is far more ethically and

¹ Arguments for using CBA as a normative guide to decision-making can be found in, e.g., Harberger (1971), Navrud (1992), Hanemann (1994), and Hahn and Litan (2005). For different views, see e.g., Kelman (1981) and Sagoff (1988). The popularity of non-market valuation and CBA in environmental economics can for example be confirmed by leafing through any volume of *Environmental and Resource Economics*.

² For a more elaborate discussion, see Nyborg (2012).

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politically controversial than most economists (and many environmentalists, physicians, engineers and others) seem to think. This holds even if one sticks – to the extent possible – to traditional theory and concepts from welfare economics, and even if one disregards widely discussed CBA controversies such as issues related to discounting and/or uncertainty, valuation techniques, altruism/agency, and CBA's anthropocentric welfarism.

To pursue this end, I use the language of standard welfare economics. While my discussion is based on a simple formal model, all results are also stated verbally, hopefully making the discussion accessible to a broader audience.

Substantial parts of my message are not at all new.³ For precisely that reason, I have been reluctant to write this paper. I have done so because, after discussing the topic with policy makers and researchers over more than twenty years, I still find that even highly competent people dealing with CBA in their daily work are totally unfamiliar with the insights summarized below.⁴

Pinpointing exactly what CBA measures, in an intuitively understandable but yet precise way, turns out to be surprisingly hard. A main problem is that the standard explanations start from assumptions with limited relevance in applied policy-making contexts. Economics textbooks often assume, implicitly or explicitly, that the purpose of a CBA is to judge projects' social welfare effects based on the value judgments (or in the language of welfare economics, the social welfare function) of some unique policy-making entity, like "the planner", "the government", or the "ethical observer".⁵ My starting point here is different. I will assume that the aim of the project analysis is to enable *each individual participant* in a democratic project selection process to judge alternative projects' social welfare effects, given his or her own value judgments.

There are two main reasons why distinguishing between these purposes is important. First, democratic procedures involve many participants (sometimes called the *demos*). The ethical and political views of these participants must be expected to differ. A very fundamental requirement of democratic decision-making is that every demo should have an equal opportunity to explore and express reasons for her views (Dahl, 2006).⁶ An analysis provided as background information to participants in a democratic process ought to be useful even to participants who do not subscribe to a particular value judgment chosen by the analyst.⁷

Second, democratic decision-making is often, by its very nature, fragmented. Power is shared, it is delegated, it is lost. Ruling parties as well as individual decision-makers can be replaced at frequent intervals, and at unexpected times. Different types of decisions are separated according to constitutional rules, or delegated to different political bodies; for example, project decisions may be made by a regional council, while the tax system is determined by Parliament. Democratic decision-making processes are characterized by conflict, compromise, negotiation and renegotiation. The assumptions made in common textbook explanations of CBA, particularly those ensuring the possible separation between efficiency and distribution concerns, become questionable under such circumstances.

³ See, for example, Dasgupta et al. (1972), Hammond (1979), Kelman (1981), Drèze and Stern (1987), Sagoff (1988), Blackorby and Donaldson (1990) and Bromley (1990).

⁴ Here are some of the reactions I tend to get, often at the same occasion: 1. This has to be wrong. 2. This is trivial. 3. This is too uncritical to economics. 4. This is too critical to be taken seriously. 5. This is too technical. 6. There is no real formal model here. 7. This is interesting.

⁵ "The key principle that underpins CBA ideally is very simple (...). The typical project will involve some winners and some losers. Some kind of social welfare function is then used to aggregate across affected individuals" (Perman et al., 2003, p. 368).

⁶ See also Nyborg and Spangenberg (2000).

⁷ In the language of welfare economics: ranking projects according to a unique policy-maker's value judgments beg for *output* from one particular social welfare function. Enabling each demo to arrive at a well-founded policy evaluation requires information that can be used as *input* into different social welfare functions (Brekke et al., 1996; Nyborg, 2000a, Nyborg, 2012).

Some scholars take a more pragmatic approach to cost–benefit analysis, not necessarily defending the welfare or efficiency interpretations at all. Sunstein (2013) points out that CBA may, by counting effects in a systematic, yet simple way, help prevent cognitive limitations and biases from causing policy-makers to neglect vital aspects of proposed policies. This is an important point which should be borne in mind.

Public policy is crucial to secure a reasonable supply of public goods. Since public funds are limited, sound economic analysis of alternative projects is important. In practice, however, the impact of CBA and monetary valuation on actual policy-making appears to be limited.⁸ This lack of influence might, of course, be due to policy-makers not understanding the CBA methodology, or simply not caring about the costs and benefits of proposed policies at all.⁹ Nevertheless, another potential explanation, which is often heard from policy-makers but rarely from economists, is that CBA simply answers other questions than those policy-makers need economists' help to answer.¹⁰ If so, economic project analysis might become more influential if analysts were concerned less with identifying 'best' projects and more with laying out projects' pros and cons in intuitively understandable ways – even if the normative evaluation itself was left to others.

2. Individual Utility

Let me start with a very simple formal framework.¹¹ While discounting, risk and uncertainty have been among the most hotly debated aspects of CBA, they are not crucial to my concern here; for the purpose of simplification, I will thus use a static, deterministic model and ignore discounting¹² as well as uncertainty. In the same vein, I assume that individual incomes are exogenously fixed, and that any income not used for contributing to public goods is spent on the individual's own private consumption. I restrict myself to discuss choices between alternative marginal projects.¹³ In this context, "marginal" means that the project's impacts on market values, as well as marginal non-market values including individuals' marginal utility of income, are small enough to be disregarded.¹⁴

In neoclassical consumer theory, 'utility' simply represents an individual's choices, or revealed preferences, regardless of her motives for these choices. Below, I will begin by replicating the standard theoretical rationale for the social welfare interpretation of cost–benefit analysis, and for that purpose the usual 'revealed preferences' utility concept is in fact insufficient (see Sen, 1979, 1985). In what follows, 'utility' should thus be thought of as a representation of what is good for the individual, i.e. her own well-being (for a more thorough discussion, see Nyborg, 2012, Ch.5). To keep the analysis simple, and avoid (otherwise likely) inconsistencies between revealed choice and well-being, I disregard the (reasonable) possibility that individuals have altruistic, idealistic and/or duty-oriented preferences (see Nyborg, 2000b; Sagoff, 1988; Sen, 1985).¹⁵

Assume that there are $n > 1$ individuals in society, who care about their own access to private as well as public goods. For any individual

⁸ Kuik et al. (1992), Fridström and Elvik (1997), Nyborg (1998), Hahn and Tetlock (2008), Hahn (2009), Odeck (2010), Rogers et al. (2013).

⁹ "The poor quality of analysis can help explain some of this ineffectiveness. However, regardless of how good the analysis is, politicians sometimes choose not to take basic economic ideas seriously" Hahn and Tetlock (2008, p. 69).

¹⁰ Nyborg (1998), (2012), Nyborg and Spangenberg (2000).

¹¹ The model is based on the presentation in Nyborg (2012).

¹² The static set-up is not crucial for the results; values below could easily be interpreted as present (discounted) values.

¹³ For major reforms, e.g., changes in the overall tax and transfer system, part of the reasoning below may require modification.

¹⁴ Here, a "project" simply means a combination of changes, compared to a base case, in the population's access to public and private goods.

¹⁵ While obviously unrealistic, these assumptions still leave my utility concept somewhat vague. A similar vagueness is inherent in most of welfare economics, and for the sake of brevity and simplicity I will leave it at that. Allowing altruistic/duty-oriented utility functions adds to the problems pointed out below, as demonstrated in Nyborg (2000b).

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