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## **Cost–Benefit Analysis**

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Cost–benefit reasoning has been a central idea not only in economics but also in several social-scientific disciplines and in philosophy as well, especially in certain approaches to moral and political theory. Reasoning according to a cost–benefit analysis (CBA) is seen as a crucial element of rationality in action and is therefore important for any philosophical understanding of social action.

This entry introduces the notion, shows the key role it plays in policy making, and gives a critical overview of the various approaches on offer.

## Overview

CBA is a tool for evaluating governmental policies. It is widely employed by applied economists and, increasingly, by governments. CBA ranks policies by summing willingness-to-pay/accept (WTP/WTA) amounts (as estimated from behavioral evidence or surveys). Consider two policies, *a* and *b*. For simplicity, assume that *a* leads for sure to outcome *x* and that *b* leads for sure to outcome *y*. Imagine that Joe prefers *y* to *x*. Joe's WTP for *y*, taking *x* as baseline, is the reduction in his monetary income in *y* that just suffices to make him indifferent between the outcomes. Similarly, if Sue prefers *x* to *y*, then her WTA for *y*, taking *x* as baseline, is the increase in her income in *y* that just suffices to make her indifferent between the outcomes.

CBA then compares policies *a* and *b* by seeing whether *x* (the outcome of *a*) has net positive monetized benefits as compared with *y* (the outcome of *b*). Take the aggregate WTP amounts of the individuals who prefer *y*, and subtract the aggregate WTA amounts of the individuals who prefer *x*. Call this value for short the “WTP/WTA aggregate” for *y* relative to *x*. CBA ranks *a* over *b* just in case this value is positive.

The definition of CBA just provided smoothly generalizes to the more realistic case where policy outcomes are uncertain—in that case, each policy corresponds to a probability distribution over outcomes—but to ease presentation, this entry will focus on the simpler case and will frame the discussion directly in terms of outcomes rather than the policies giving rise to them.

## Approaches and Critiques

CBA has been criticized on numerous grounds, and the most important are the following.

### Ordering Failure

CBA can actually fail to rank outcomes in a minimally rational manner. It turns out to be possible that the WTP/WTA aggregate for *y*, relative to *x*, is positive (so that CBA says *y* is a better outcome) but that the WTP/WTA aggregate for *x*, relative to *y*, is also positive. It is also possible that everyone prefers *z* to *y* but that the WTP/WTA aggregate for *z*, relative to *x*, is less than the WTP/WTA aggregate for *y*, relative to *x*.

These ordering failures, however, can be solved via a refinement of the CBA test. Given a set of outcomes, arbitrarily choose one (*x*) as baseline. For every other outcome *y*, assign it an overall amount equaling the *negative* WTP/WTA aggregate for *x*, relative to *y*. (Assign *x* an overall amount of 0.) Rank outcomes according to these overall amounts. This ranking will be

transitive; there will never be reversals, with each of a pair of outcomes ranked better than the other; and if everyone prefers one outcome, it will be ranked better.

### Kaldor-Hicks Efficiency and the Justification of CBA

One outcome is *Pareto superior* to a second if everyone prefers the first. The CBA test does not, of course, guarantee Pareto superiority. The WTP/WTA aggregate for  $x$ , relative to  $y$ , can be positive, even though some prefer  $x$  and others,  $y$ .

However, CBA is often defended by invoking the idea of *potential* Pareto superiority or, equivalently, Kaldor-Hicks efficiency. Outcome  $x$  is Kaldor-Hicks efficient, relative to  $y$ , if there is a hypothetical, costless redistribution of resources—converting  $x$  into  $x^*$  such that  $x^*$  is Pareto superior to  $y$ . Leaving aside some technical issues, it is roughly true that if the WTP/WTA aggregate for  $x$ , relative to  $y$ , is positive, then  $x$  is Kaldor-Hicks efficient relative to  $y$ .

Less formally, one outcome passes the CBA test, relative to a second, if those who gain from the first outcome could, in principle, fully compensate those who lose, via a scheme of compensation payments with no administrative costs—leaving everyone better off.

However, the nexus between CBA and *hypothetical* compensation does not really furnish much of a justification. If  $x$  is Kaldor-Hicks efficient relative to  $y$ , but not Pareto superior, there are some individuals who prefer  $y$ . Why do the premises that (a) everyone prefers  $x^*$  to  $y$  and (b)  $x$  is transformable into  $x^*$  warrant the conclusion that (c)  $x$  (and not just  $x^*$ ) is better than  $y$ ? To tell those made worse off by some governmental policy that they *could* be compensated hardly answers their complaints about the policy if compensation is not, in fact, forthcoming.

A better justification for CBA sees it as a rough proxy for overall well-being. The fact that the WTP/WTA aggregate for  $x$ , relative to  $y$ , is positive indicates (albeit fallibly so) that the aggregate well-being gain of those who benefit from  $x$  exceeds the aggregate well-being loss of those who are worse off. This argument assumes that we can make interpersonal comparisons of well-being: If Jim is better off in  $x$  and Sheila in  $y$ , then the change in Jim's well-being can be compared with the change in Sheila's. The argument also presupposes that money has roughly the same "utility" for Jim as for Sheila—that money in Jim's hands is transformed into well-being at roughly the same "rate" as money in Sheila's hands. If Jim is much richer than Sheila, then it is quite possible that some policy produces a small welfare benefit for Jim (relative to some baseline) and a larger welfare loss for Sheila, and yet Jim's WTP for the policy relative to baseline is greater than Sheila's WTA.

CBA's reliability as a proxy for overall well-being can be improved by "distributional" weights. Each person's WTP/WTA is multiplied by a weighting factor, inversely proportional to her wealth. Some academic work, and even governmental practice, takes this approach.

### Preferences and Well-Being

CBA understands well-being as preference satisfaction. Such a view is standard in economics but still quite problematic. Someone's preferences might be hasty and unreflective. She might be insensitive to relevant facts. More subtly, her preferences might incorporate moral considerations. For example, if Sue on balance prefers  $x$  to  $y$ , even though her income is lower, because she judges the distribution of income in  $x$  to be fairer, Sue herself might quite possibly be worse off in  $x$ .

A more plausible view analyzes well-being in terms of idealized (fully informed, fully rational) and self-interested preferences and refines CBA by aggregating WTP/WTA amounts relative to such preferences. To be sure, specifying “full information,” “full rationality,” and “self-interest” poses major challenges.

### Welfarism, Consequentialism, and Inequality

CBA (whether understood as an indicator of Kaldor-Hicks efficiency or, instead, of overall welfare) is consequentialist and welfarist in ranking outcomes. Welfarism says that if each person is equally well-off in two outcomes, the two are equally good. CBA satisfies this constraint (with well-being defined as preference satisfaction or as idealized and self-interested preferences with a matching refinement of the CBA test).

Consequentialism, at the level of governmental choice, says that government should evaluate policies in light of the goodness of their outcomes. CBA takes this route, and thus it is insensitive to deontological side constraints that arguably constrain the maximization of good consequences—side constraints barring torture, killing, deception, and so on.

Finally, CBA (even as corrected to incorporate distributive weights counterbalancing the variable “utility” of money) is an indicator of overall (total) well-being and does not take account of whether the distribution of well-being is more or less equal.

Challenges to CBA based on these concerns raise many complex issues. One response is to see overall welfare as *one* normative factor relevant to government choice, along with others: non-welfare goods, deontological side constraints, and fair distribution. CBA, on this view, is not a “superprocedure” but instead a rough proxy for *one* of the items (overall welfare) that government should care about.

### Incommensurability

Many find it problematic that CBA employs money as a universal metric. CBA supposes that *whatever* the qualitative differences between two outcomes bearing on some individual's well-being, there is a single WTP/WTA amount for her that perfectly equilibrates those differences. Is this really true? For example, suppose that Fred has more friends in one outcome. Is the welfare value of these additional friends precisely equal to the value of any specific change in Fred's monetary assets? Isn't friendship valuable just because we resist thinking about its value in monetary terms? Suppose, tragically, that Fred loses a child. Can any sum of money compensate him for his loss?

The “incommensurability” critique of CBA subsumes these various challenges: (a) *incomparability* (that someone might be incomparably well-off in two outcomes rather than better off in one or equally well-off in both), (b) *constitutive incommensurability* (that the welfare value of certain goods consists in refusing to consciously monetize them), and (c) *lexical orderings* (that some losses are too great to be compensated by dollars).

CBA can be refined to deal with the incomparability challenge (although at the cost of additional complexity). CBA does require individuals to consciously monetize goods—but only occasionally, when posed a monetization question as part of a “stated preference” survey, designed to estimate WTP/WTA amounts. Nothing in CBA requires that individuals engage in ongoing monetary thinking throughout day-to-day life; and to insist that some goods are damaged if *ever* consciously monetized would seem to understate the resilience of these

goods. Finally, CBA handles lexical orderings by shifting from the valuation of a good to the valuation of the risk of gaining or losing it. This is the approach used to arrive at WTP/WTA values for policies that save lives or cause deaths.

- incommensurability
- baseline
- well-being
- self-interest
- consequentialism
- preference
- proxy

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**See also**

- [Homo Economicus](#)
- [Pareto Optimality](#)
- [Policy Applications of the Social Sciences](#)
- [Rational Expectations](#)
- [Social Choice Theory](#)
- [Welfare Economics](#)

### **Further Readings**

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