

*Working Paper #2008-06*

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## Ethical Benefit Cost Analysis as Art and Science Ten Rules for Benefit-Cost Analysis

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“All people of broad, strong sense have an instinctive repugnance to the men of maxims; because such people early discern that the mysterious complexity of our life is not to be embraced by maxims, and that to lace ourselves up in formulas of that sort is to repress all the divine promptings and inspirations that spring from growing insight and sympathy.” (GEORGE ELIOT/MARY ANN EVANS, *THE MILL ON THE FLOSS* 518 (Penguin Books 1979) (1860).

### **I. Introduction**

Benefit-cost analysis (BCA) is commonly viewed either as a mechanical tool for making decisions or as a failed technique of decision-making that avoids moral, interactive, and ethical components. It is properly neither. Benefit-cost analysis is an art form that can produce useful information with the potential to improve decision-making. To understand this we must consider current criticisms and come around to another way of looking at BCA.

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Benefit-cost analysis (BCA) is widely seen as such a maxim as men create: a mere equation for deciding issues of fundamental values. It is seen as a rule by which preferences and emotions are valued, yet how can a maxim encompass these? It is hardly surprising then that BCA is the object of longstanding and expansive contumely and even repugnance. Yet, it is as widely esteemed by practical people, “mere men of business,” one might say. To put it crudely, BCA is approved of more generally by those that live in the world but is apt to be disparaged by those of a philosophic mind who see it as “. . . a lust for mechanical objectivity.”<sup>1</sup> Mechanical objectivity, however, is a view from which BCA has moved.

BCA properly is an art form embodying elements of law, morality, judgment, and science. It is a method of structuring conversation and organizing knowledge. It is not a maxim, nor can it be acceptably reduced to mechanical objectivity. To recognize BCA as partly reductionist is not to prove it without value, nor without the flexibility to adapt to change. As a method it is necessarily reductionist, but reductionist sciences have proven to be very powerful.<sup>2</sup> The test of a method is whether it is useful, and BCA undeniably has been,<sup>3</sup> notwithstanding claims to the contrary.<sup>4</sup>

This paper contributes to the process of attaining greater uniformity of principles and standards within BCA. Practitioners and critics alike are sometimes unclear precisely what they mean when they speak of BCA, as there is no one uniform method or

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<sup>1</sup> THEODORE M. PORTER, TRUST IN NUMBERS: THE PURSUIT OF OBJECTIVITY IN SCIENCE & PUBLIC LIFE 187 (1995).

<sup>2</sup> See STUART KAUFFMAN, REINVENTING THE SACRED: A NEW VIEW OF SCIENCE, REASON, & RELIGION Ch. 2 (Basic Books 2008).

<sup>3</sup> See PORTER, *supra* note 1.

<sup>4</sup> See, e.g., Frank Ackerman & Lisa Heinzerling, *Pricing the Priceless: Cost-Benefit Analysis of Environmental Protection*, 150 U. PA. L. REV. 1553 (2002); FRANK ACKERMAN & LISA HEINZERLING, PRICELESS: ON KNOWING THE PRICE OF EVERYTHING & THE VALUE OF NOTHING (2004).

concept. Toward this end, I will briefly consider the benefit-cost principle, the considerations that lie behind it and criticisms that have been made of it in light of these considerations. In response to these criticisms, and to establish more clearly what BCA precisely is, I then describe a version of BCA that I call Ethical Benefit-Cost Analysis. I outline EBCA through establishing a set of rules – a meta-set of principles and standards to guide the practice of BCA. Finally, I show that in principle, this is both a superior version of efficiency and more accurately reflects our moral compass.

## II. The Benefit-Cost Principle

Modern benefit-cost analysis arose out of discussions among prominent British economists during the late 1930s.<sup>5</sup> Before that time, it was generally assumed that each individual had an “equal capacity for enjoyment,” and that gains and losses among different individuals could be directly compared.<sup>6</sup> Robbins challenged this view by arguing that interpersonal comparisons of utility were unscientific so that no such direct comparison could be made.<sup>7</sup> Kaldor acknowledged Robbins’ point about the inability to make interpersonal utility comparisons on any scientific basis, but suggested it could be made irrelevant.<sup>8</sup> He suggested that, when a policy led to an increase in aggregate real income,

...the economist’s case for the policy is quite unaffected by the question of the comparability of individual satisfaction, since in all such cases it is

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<sup>5</sup> These economists were Robbins, Hicks, Kaldor, and Harrod, all writing in the *ECONOMIC JOURNAL*.

<sup>6</sup> See EZRA J. MISHAN, *AN INTRODUCTION TO NORMATIVE ECONOMICS*, 120-21 (1981); Peter Hammond, *Welfare Economics*, in *ISSUES IN CONTEMPORARY MICROECONOMICS AND WELFARE* 406 (George Feiwel ed., 1985).

<sup>7</sup> Lionel Robbins, *Interpersonal Comparisons of Utility: A Comment*, 48 *ECON. J.* 640 (1938).

<sup>8</sup> Nicholas Kaldor, *Welfare Propositions of Economics and Interpersonal Comparisons of Utility*, 49 *ECON. J.* 549-550 (1939).

possible to make everybody better off than before, or at any rate to make some people better off without making anybody worse off.<sup>9</sup>

Kaldor went on to note that whether compensation should take place “is a political question on which the economist, qua economist, could hardly pronounce an opinion.”<sup>10</sup> Hicks accepted this approach,<sup>11</sup> which came to be called the Kaldor-Hicks Test (KH), or, more often, the Potential Compensation Test (PCT). The PCT has been the standard for benefit-cost analysis for some sixty years. Its original justification was to separate economic efficiency from equity so as to avoid interpersonal comparisons. As Chipman and Moore<sup>12</sup> and Zerbe<sup>13</sup> have noted, this goal has not been achieved, nor should it be, nor can it be, nor need it be.

In BCA, preferences for gains in the form of projects or goods are measured by the willingness to pay for them (WTP). For example, if we are considering reducing noise levels at an airport by requiring new mufflers on airplanes, we would, *inter alia*, ask residents near the airport how much they would be willing to pay to achieve a certain reduction in noise and compare this amount to the costs to the airline of installing the mufflers.<sup>14</sup> The preference to avoid losses (the cost) is measured by the willingness to accept payment to bear the loss (WTA). In the above example, airlines’ WTA to avoid the cost is represented by the costs to the airlines of installing the mufflers. When the overall preference for obtaining a good is greater than the overall preference to avoid

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<sup>9</sup> *Id.*

<sup>10</sup> *Id.* It was thought that politicians or non-economists should make judgments and decisions about income distribution effects.

<sup>11</sup> J.R. Hicks, *The Foundations of Welfare Economics*, 49 *ECON. J.* 697 (1939).

<sup>12</sup> See John Chipman & James C. Moore, *The New Welfare Economics 1939-1974*, 19 *INT’L ECON. REV.* 547 (1978).

<sup>13</sup> RICHARD O. ZERBE, JR., *ECONOMIC EFFICIENCY IN LAW AND ECONOMICS* 11 (1991). [Herein after ZERBE, *ECONOMIC EFFICIENCY*].

<sup>14</sup> A discussion of the adjustments to transform engineering costs into social costs is beyond the scope of the paper.

losing the good, the project passes the Kaldor-Hicks test. This is generally regarded as a reasonable maxim and as a reasonable way of ordering preferences for a single individual. When aggregated over several individuals, however, the matter is less simple, and less widely accepted. The original moral foundation for such aggregation was the concept of potential compensation.

The concept of potential compensation justified KH on the grounds that when KH was passed the winners from the project *could* potentially compensate the losers. Thus the project could potentially be without losers, thereby satisfying the Pareto test.<sup>15</sup> This would take judgments about the distribution of benefits and losses out of the hands of economists and put them into the political process. From an economist’s perspective, this would make BCA more “scientific.”

The WTP and WTA reflect time preferences – e.g. the difference between how much right now I value fifty dollars you give me today weighed against how much I value fifty dollars you will give me a year from now – through the use of a discount rate. BCA is thus reduced to the simple formula of comparing the discounted value of the gains and losses as follows:

$$(1) \quad NPV = \sum_t^T \sum_j^J \frac{(B_j t - C_j t)}{(1+r)^t}$$

Where  $B_{jt}$  are benefits for person  $j$  measured in time  $t$  as measured by the willingness to pay,  $C_{jt}$  are costs to person  $j$  in time  $t$  measured by the willingness to accept payment,  $r$  is the discount rate and  $T$  is time period of the project’s effects.

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<sup>15</sup> The Pareto test of efficiency is the precursor to the KH test. It states that a state of the world is preferable to the status quo when someone gains from the new state of the world and no one loses. RICHARD O. ZERBE, JR. & DWIGHT DIVELY, *BENEFIT-COST ANALYSIS IN THEORY AND PRACTICE* (1994).

This simple formulaic statement disguises deep considerations that lie behind the WTP, WTA, and the discount rate. These considerations include the role that rights and the law play in determining whether WTP or WTA is the appropriate measure of value, whose and what sort of preferences should be given economic standing and counted, and how ethical considerations are to be used in BCA. The simple formulaic understanding of BCA, along with misunderstanding about the nature of goods, is nevertheless what drives the criticisms of BCA.

### **III. Criticisms of the Benefit-Cost Principle**

The criticisms of BCA are wide-ranging, frequent and repetitious. They are embodied mainly in academic legal-philosophical literature, and appear motivated by the increasing use of BCA in decision-making, by the encroachment of economic thinking into law, and by the attraction of easy criticisms, given the absence of clearly defined foundational values for BCA.<sup>16</sup> Much of the critical literature is not aimed at improving the practice of BCA, or at identifying deficiencies of particular analyses. Rather, it critiques the foundational deficiencies of BCA, i.e., it criticizes the use of BCA itself.

The leading criticism emphasizes the reductionist nature of BCA as a mechanical algorithm that is used to answer questions about what people want – the result of what, as mentioned above, Ted Porter describes as “lust after mechanical objectivity.”<sup>17</sup> Other criticisms of BCA include that it is missing values; that it pays too little attention to “good” values such as integrity and perhaps too much attention to “bad” values such as

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<sup>16</sup> See, e.g., CHARLES FRIED, RIGHT AND WRONG 93 (1978); Steven Kelman, *Cost-Benefit Analysis: An Ethical Critique*, AEI J. ON GOV'T & SOC'Y REG. 33-40 (1981); Ronald M. Dworkin, *Is Wealth a Value?*, 9 J. LEGAL STUD. 191 (1980); and Henry S. Richardson, *The Stupidity of the Cost-Benefit Standard*, 29 J. LEGAL STUD. 971, 984-85 (2000).

<sup>17</sup> PORTER, *supra* note 1.

envy;<sup>18</sup> that it is rooted in a narrow utilitarianism;<sup>19</sup> that it uses private values where public values are relevant;<sup>20</sup> that it favors the preferences of the rich and does not consider issues of income distribution or fairness; that it ignores transaction costs;<sup>21</sup> and that it provides an answer that is without meaning as a result of attempting to combine incommensurables in a single metric. Some critics have also correctly noted that BCA's derivation by deductive logic is flawed.

A separate rationalist criticism is that that BCA is rendered useless by the Scitovsky reversal paradox.<sup>22</sup> Scitovsky showed that using KH one could move from state of the world A to B and then, having arrived at B, use KH to move back to A, thus continually cycling. This technical problem generated by economists has been advanced by some as a reason to dismiss BCA entirely. Coleman has dismissed BCA on these

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<sup>18</sup> See Martha Nussbaum, *The Costs of Tragedy: Some Moral Limits of Cost-Benefit Analysis*, 29 J. LEGAL. STUD. 1005, 1032 (2000) (counseling against BCA on the ground that the results reached may be subject to "serious moral wrongdoing"); Amartya Sen, *The Discipline of Cost-Benefit Analysis*, 29 J. LEGAL. STUD. 931, 945-46 (2000) (explaining that BCA is limited because of signaling issues, such as distributional valuations and values of externalities and interdependencies); J. Quiggin, *Altruism and Benefit-Cost Analysis*, 36 AUSTRALIAN ECON. PAPERS 144-155 (1997) (suggesting that to include moral sentiments would unwisely require also inclusion of immoral sentiments).

<sup>19</sup> See Ronald Dworkin, *Is Wealth a Value?*, 9 J. LEGAL STUD. (1980).

<sup>20</sup> See generally ELIZABETH ANDERSON, *VALUES IN ETHICS AND ECONOMICS* (1993); MARK SAGOFF, *THE ECONOMY OF THE EARTH* 11 (Douglas MacClean, ed., 1988); JOHN C. SMART & BERNARD WILLIAMS, *UTILITARIANISM: FOR AND AGAINST* (Cambridge Univ. Press, 1973).

<sup>21</sup> See RONALD H. COASE, *THE FIRM, THE MARKET, AND THE LAW* 5 (1988).

<sup>22</sup> See Jules L. Coleman, *Efficiency, Utility and Wealth Maximization*, in *MARKETS, MORALS AND THE LAW* 95-132 (1988). See also Richard S. Markovits, *A Constructive Critique of the Traditional Definition and Use of the Concept of "The Effect of a Choice on Allocative (Economic) Efficiency": Why the Kaldor-Hicks Test, The Coase Theorem, and Virtually all Law-and-Economics Welfare Arguments are Wrong*, U. ILL. L. REV. 485, 512-515 (1993). Scitovsky's original article may be found at Tibor de Scitovszky, *A Note on Welfare Propositions in Economics*, 9 REV. ECON. STUDIES 77-88 (1941) (the author later changed his name to Scitovsky).

grounds,<sup>23</sup> and in a recent book, Markovits writes, “This Scitovsky Paradox invalidates the Kaldor-Hicks test because it implies that, if the test were accurate, and a Scitovsky paradox arose, both the policy and its reversal would be economically efficient and, hence, the policy would be simultaneously economically efficient and economically inefficient.”<sup>24</sup>

Economists and practitioners using BCA generally ignore these criticisms for three good reasons. First, the critics fail to offer viable substitutes, except for vague references to political discussion.<sup>25</sup> The critics do not compare the results of BCA with those of potential alternative approaches, and are therefore unable to answer whether BCA is better than its alternatives.

Second, critics fail to address whether BCA is useful and, if it is, how it might be improved.<sup>26</sup> Without determining empirically whether or not BCA is useful, how is it possible to argue persuasively against its use? Without being provided with suggestions for improvement, why should practitioners pay attention? This shortcoming is as true of recent criticisms, such as those by Ackerman and Heinzerling,<sup>27</sup> as it is of the huge volume of past criticisms. Until recently, defects found by critics were generally

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<sup>23</sup> Coleman, *supra* note 22, 519f. Coleman uses an example which is materially flawed. Richard O. Zerbe, Jr., *The Legal Foundation of Cost-Benefit Analysis*, 2 CHARLESTON L. REV. 94 (2007). [Herein after Zerbe, *Legal Foundation*]

<sup>24</sup> RICHARD S. MARKOVITS, *TRUTH OR ECONOMICS: ON THE DEFINITION, PREDICTION, AND RELEVANCE OF ECONOMIC EFFICIENCY* 14 (Yale University Press 2008).

<sup>25</sup> See Henry S. Richardson, *The Stupidity of the Cost-Benefit Standard*, 29 J. LEGAL STUD. 971, 984-85 (2000); SAGOFF, *supra* note 20. Many critics, however, are concerned with approaches to promoting a political framework for results where, for example, participants’ preferences can change in the course of discussion. See, e.g., Louis E. Wolcher, *Senseless Kindness: The Politics of Cost-Benefit Analysis* 25 LAW & INEQ. 147 (2007).

<sup>26</sup> See Richardson, *supra* note 25; SAGOFF, *supra* note 20; William Hildred & Fred Beauvais, *An Instrumentalist Critique of Cost-Utility Analysis*, 29 J. ECON. ISSUES 1083 (1995).

<sup>27</sup> *Supra* note 4.

unsupported by examination of actual projects using BCA,<sup>28</sup> so it was uncertain whether, as a matter of fact, these defects existed. Though recent critics attempt to examine actual studies and uses of BCA, these criticisms contain important errors,<sup>29</sup> and are thus unconvincing.

Third, the invocation of the Scitovsky paradox is misplaced and incorrect. The conditions under which a Scitovsky reversal would occur are so rare and unlikely they can be ignored.<sup>30</sup> For example, the Scitovsky paradox only arises when inferior goods are involved.<sup>31</sup>

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<sup>28</sup> See Hildred & Beauvais, *supra* note 26. One exception to this is Professor Calandrillo, who notes figures for the “value of life” used in benefit-cost analysis studies. Steve P. Calandrillo, *Responsible Regulation: A Sensible Cost-Benefit, Risk Versus Risk Approach to Federal Health and Safety Regulation*, 81 B. U. L. REV. 986–87 (2001). He then goes on to agree that it is disturbing to put a value on life but finds that doing so produces better results than not.

<sup>29</sup> See Alan Carlin, *The New Challenge to Cost-Benefit Analysis*, 28 REGULATION, FALL 2005, at 18 (criticizing Ackerman, Heinzerling and Massey’s empirical analyses).

<sup>30</sup> Andrew Schminz & Richard O. Zerbe, *The Relevance of the Scitovsky Reversal Paradox for Cost-Benefit Analysis* (Apr. 15, 2008) (submitted to J. POL’Y ANALYSIS & MGMT., on file with the University of Washington).

<sup>31</sup> I offer the following simple proof. For normal goods, the WTA for the good will, by definition, be greater than would be the WTP for the good. RICHARD O. ZERBE, JR. & ALLEN S. BELLAS, *A PRIMER FOR BENEFIT-COST ANALYSIS* (2006). Choices are inferior when higher incomes lead one to desire smaller, rather than larger, amounts of the choice good. Inferiority requires that the WTP for a good is greater than the WTA to give up the same good for the same group of people. ZERBE, *ECONOMIC EFFICIENCY*, *supra* note 13.

Suppose all goods are normal (not inferior) and that there are two persons or groups, 1 and 2, and two states of the world, A and B. By definition, for a normal good for a single individual, the absolute value of the WTA exceeds the WTP, i.e. I must be paid more to give something up than I will pay to acquire it. MISHAN, *supra* note 6. The letters a,b,c,d in Table 3 represent abstract WTP and WTA values for a given good, and are assumed to be absolute values:

**Table 3: Scitovsky Reversals Are Not Possible for Normal Goods**

	WTP	WTA	NPV
Person 1	a	b	
Person 2	c	d	
Value of Move From A to B			a-d
Value of a Move From B to A			c-b

These criticisms are based on an outdated view of BCA that assumed moral sentiments, ethical considerations, and distributional consequences were not to be considered,<sup>32</sup> and saw BCA as a mechanical exercise.<sup>33</sup> The current view of BCA includes moral sentiments and ethical considerations, and considers the role of BCA as providing useful information, rather than giving a mechanical answer to the decision-making process. When our view is expanded to include moral sentiments as preferences that represent economic goods, and BCA is put in proper context as an art form with its role in providing information recognized, the criticisms are obviated.

The issues that garner criticism for BCA also contribute to its practice being an art form. In the sections below, I describe this art form, and clarify rules for its ethical and practical use.

#### **IV. Ethical Benefit-Cost Analysis: The Art Form**

By art form, I mean to describe a procedure that relies on nuanced judgment. The basis for Ethical BCA is an expansion of KH that I call the Kaldor-Hicks-Moral

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Normality requires that  $b > a$  and  $d > c$ . KH is passed in a move from A to B if  $a > d$ ; e.g. if Person 1 is willing to pay more than Person 2 is asking. The reverse move from B to A passes KH if  $c > b$ . With normality, however, it is not possible for  $c$  to be greater than  $b$ . This is because  $b > a$  (by definition of normality); and  $a > d$  (since KH is passed), then  $b > d$ , and  $d > c$ , which violates normality. The full sequence is as follows:  $b > a$ ,  $a > d$ , so  $b > d$ , but  $d > c$ .  $d > c$  so that  $c$  cannot be greater than  $b$  (since  $b > d$ ). Thus no reversal is possible. Normality is a sufficient condition for there to be no possibility of a reversal.

With inferiority,  $a > d$  by assumption,  $a > b$  by inferiority, and  $c > d$  by inferiority. From this, we can make no conclusion about whether or not  $c$  is greater or less  $d$ ; that is,  $c > = < b$ , so reversal could occur but it need not occur. This shows that inferiority is a necessary but not sufficient condition for a Scitovsky reversal.

<sup>32</sup> Elsewhere I show how these deficiencies in BCA arose from the mistaken attempt to eliminate interpersonal comparisons of utility in the early development of economic BCA. Zerbe, *Legal Foundation*, *supra* note 23.

<sup>33</sup> See, e.g. Ackerman & Heinzerling, *supra* note 4.

(KHM).<sup>34</sup> KHM adds to KH (1) the requirement that all ethical values for which there is a WTP or WTA be included in the analysis, including those concerning distributional and ethical considerations<sup>35</sup> more generally; (2) the elimination of the PCT test and its replacement with the simple requirement that the net present value of a project be positive, *where the definition of benefits and losses are grounded in law*; (3) the understanding that proper use of ethical BCA is to furnish information and predictions, and not to furnish the decision; (4) that transactions-cost economics rather than market failure is the basis for a benefit-cost justification that government intervention might be useful; and (5) that there is a moral basis for BCA.

Ethical BCA requires an understanding and illumination of how benefits and costs are related to legal rights.<sup>36</sup> It insists on addressing the question of whether “bad” utility (in such forms as envy, malice, sadism, or gains from theft) is to be counted as part of BCA. It considers where the line should be drawn in determining standing to have values counted. It addresses the questions of whether the value of moral sentiments and considerations of equity are to be counted as part of BCA, and whether the role of BCA is to inform the decision-making process or to provide the answer to it. Answers to these

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<sup>34</sup> Richard O. Zerbe, Jr. et al., *An Aggregate Measure for Benefit-Cost Analysis*, ECOLOGICAL ECON. (2005). [Herein after Zerbe, et al, ECOLOGICAL ECON.]

<sup>35</sup> By ethical considerations I mean concern for others, what Thomas Jefferson regarded as virtue. The more important 18th century Scottish philosophers, including Hume, argued that virtue consisted of the proper balance between other-regarding and self-regarding values. Jefferson regarded virtue as residing only in other-regarding values. See R.G. Frey, *Moral Sense Theory and the Appeal to Natural Rights in the American Founding*, in LIBERTY AND AMERICAN EXPERIENCE IN THE EIGHTEENTH CENTURY (David Wormerseley ed., Liberty Fund, 2006);

<sup>36</sup> See David Cohen & Jack L. Knetsch, *Judicial Choice and Disparities Between Measures of Economic Values*, 30 OSGOODE HALL L.J. 737 (1992).

questions bear both on the moral stature of BCA and its acceptability.<sup>37</sup> The foundations of Ethical BCA rest in law, as gains and losses are defined based on legal rights. Since rights are sometimes unclear, however, some judgment may be required. In addition, subtle questions often arise about preferences. Whose preferences should count? Do “bad preferences” such as envy, malice, jealousy, and hatred count? Do the preferences count of those who are initially without knowledge of a project and who only care once they are informed? Do ethical sentiments count? How are preferences to be treated when preferences of the public differ from expert opinion?

When we consider BCA as an exercise that takes into account its foundations, the process shifts from what has been perceived as a mechanical exercise to practice of a balanced science and art form. The science component of ethical BCA follows from its derivation from deductive reasoning and its striving for uniform and reproducible measurement. The following rules for BCA follow from ethical BCA and a consideration of foundational questions.

## **V. Artistic Rules for Ethical BCA**

### **Rule One: Benefit-Cost Preferences Rest on Existing Rights.**

The role of BCA is to suggest marginal improvements *given the existing pattern of rights*.<sup>38</sup> The definition of WTP and WTA rests on law. The WTA payment presupposes a right to some status quo position from which losses are to be counted.

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<sup>37</sup> Some critics start from an apparent dislike of markets and simply extend this dislike to benefit-cost as an approach that mimics markets. Economists on their part are often reluctant to recognize the normative nature of their discipline when applied to policy.

<sup>38</sup> Paul Heyne, *The Foundations of Law and Economics*, 11 RES. L. & ECON., 53-71 (Richard O. Zerbe Jr. ed., Elsevier, 1988).

This choice between WTP and WTA is properly based on psychological expectations and its connections to legal ownership. From a legal perspective, the use of WTA to measure losses and WTP to measure gains rests on a normative decision to recognize ownership. Gains and losses are to be measured from a psychological reference point which stems from one's beliefs about ownership. Legal rights largely determine one's beliefs about ownership. The WTP measure assumes that one does not have psychological or legal ownership of the good or the right and asks how much one would pay to obtain it. The WTA measure assumes that one owns the good or right and asks how much one would accept to sell it.<sup>39</sup>

The earlier example of the WTP and WTA to reduce airplane noise assumed the legal starting point was a society in which the residents had no right to quiet. If, however, we decide the residents at the airport have a legal right to quiet, then instead of asking them what they would pay (WTP) for quiet, we ask them what they would be willing to accept (WTA) to bear the noise.<sup>40</sup> This would then be considered the benefit of noise reduction, and would be compared with the airlines' WTP to avoid the loss.

Ownership establishes a reference point from which losses are to be calculated by WTA and gains by WTP. The law has long recognized that it is more serious to stop an owner from conducting an ongoing activity than to prohibit the owner from undertaking the same activity if he has not yet begun it. The currently fashionable expression of this view may be found in Justice Brennan's phrase in *Penn. Central Trans. Co. v. City of*

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<sup>39</sup> See Daniel Levy & D. Friedman, *The Revenge of the Redwoods? Reconsidering Property Rights and the Economic Allocation of Natural Resources*, 61 U. CHI. L. REV. 493 (1994).

<sup>40</sup> For normal goods the WTA > WTP. ZERBE & DIVELY, *supra* note 15.

*New York*, that a restriction is more likely to result in a taking if it destroys “investment backed expectations.”<sup>41</sup>

The law will determine whether WTP or WTA will be used. The law will be the major determinant of psychological reference points. Even if the economic standard is psychological ownership, the psychological point of view and the law will correspond to each other and to the sociological point of view.<sup>42</sup> The assumption is that a choice based on assigned legal entitlements is correct because of the correspondence between the legal and psychological states; it is not correct or incorrect as a matter of economic principle. Economic efficiency in the KHM form would recognize the psychological status quo as primary and change ownership to conform to it. As a matter of practice, the relevant psychological reference point cannot be just that of the individual but rather must be that of society generally. Insofar as the law embodies the general understanding, the law should govern. The underlying basis is the general psychological reference point. Where this reference point differs from the law, it furnishes a guide for further development of the law, as indeed it has done with the development of common law.<sup>43</sup>

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<sup>41</sup> Penn. Central Trans. Co. v. City of New York, 438 U.S. 104 (1978). Thanks to Professor William B. Stoebuck for this reference.

<sup>42</sup> See Richard O. Zerbe, Jr., *Justice and the Evolution of the Common Law* 3 J. L. ECON. & POL'Y 81, 81 (2006) (arguing that the common law tends towards efficiency as a matter of justice).

<sup>43</sup> This approach makes clear the irrelevancy of the objection in critical legal studies to BCA, as Heyne has shown. See Heyne, *supra* note 38. In brief, the argument in such critical legal studies is that we cannot use the concept of efficiency without endorsing some concept of property rights, from which it is seen to follow that the concept of efficiency cannot be used to resolve disputes over property rights without begging the question. Just as the law does, BCA takes the existing structure of rights as extant. But there are disputes that reflect uncertainty about some small portions of these rights. BCA merely furnishes information relevant to the legal decision about the allocation of such a right. Take a simple case: a change in technology makes valuable rights to the radio wave spectrum which has hitherto been unowned. No party has a superior claim. The assignment of the right to a particular party will be a gain. Gains in economic analyses are to be measured by WTP, which will be partly determined by the existing pattern of wealth, which rests on the existing system of rights. Economic analysis suggests

Ethical BCA builds on the same WTP and WTA measures as BCA. The WTP and WTA need to be embedded in legal rights as economists have now shown.<sup>44</sup> The nexus between legal rights and economic measurement has become apparent and is discussed in relevant literature. Many have argued for the inclusion of equity effects, including those on income distribution, and have suggested various schemes to accomplish this outcome.<sup>45</sup> Some have applied these suggestions to actual policy issues.<sup>46</sup> Recently, economists have found it important to understand the role of social and cultural factors like altruism.<sup>47</sup> Kaplow's and Shavell's views of efficiency accord with KHM, and they note that "the only limit on what is included in well-being is to be found in the minds of the individuals themselves."<sup>48</sup> Similarly, for environmental economists the importance of existence values, which are a type of ethical value, has forced their consideration. Although some economists would like to achieve the separation of the altruistic component from existence values, as some have claimed to

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auctioning off the right. The right in general should go to that party who would pay the most for it if transactions costs were zero. Cases in which conflicting prior claims exist raise more difficult questions, but these are answerable with the logic of ethical BCA. See ZERBE, ECONOMIC EFFICIENCY, *supra* note 13.

<sup>44</sup> See Jack L. Knetsch, *Assumptions, Behavior Findings, and Policy Analysis*, 14 J. POL'Y ANALYSIS & MGMT. 1, 68–78 (1995).

<sup>45</sup> See Arnold Harberger, *On the Use of Distributional Weights in Social Cost-Benefit Analysis*, 86 J. POL. ECON. 87 (1978); Robert E. Willig & Elizabeth E. Bailey, *The Economic Gradient Method*, 69 AM. ECON. REV. 2, 96–101 (1979); Richard O. Zerbe Jr., *An Integration of Equity and Efficiency*, 73 WASH. L. REV. 349, 361 (1998). See also Martin Feldstein, *Distributional Preferences in Public Expenditure Analysis*, in REDISTRIBUTION THROUGH PUBLIC CHOICES 136-61 (Harold M. Hochman and George E. Peterson eds., Columbia University Press, 1974).

<sup>46</sup> See, e.g., Richard O. Zerbe Jr. and Sunny Knott, *An Economic Justification for a Price Standard in Merger Policy: The Merger of Superior Propane and ICG Propane* 21 RES. L. & ECON. 409-444 (2004).

<sup>47</sup> James Andreoni, *Cooperation in Public-Goods Experiments: Kindness or Confusion?* 85 AM. ECON. REV. 4, 891 (1995).

<sup>48</sup> See LOUIS KAPLOW & STEVEN SHAVELL, FAIRNESS VERSUS WELFARE 19 (2002). I expressed this view earlier in several publications; KHM was introduced in 1998 in Richard O. Zerbe, Jr., *Is Cost-Benefit Analysis Legal? Three Rules*, 17 J. POL'Y ANALYSIS & MGMT. 419 (1998) [Herein after Zerbe, *Three Rules*], and expanded in ZERBE, ECONOMIC EFFICIENCY, *supra* note 13.

have done, this is probably not possible, as Dana and others note, and moreover it is not desirable.<sup>49</sup> The evidence suggests that recognition of the importance of non-use values is intrinsically bound up with issues of ethical consideration. Respondents to surveys and experiments show a willingness to pay in regard to ethical considerations for the existence of environmental amenities that will be used by people other than themselves.<sup>50</sup>

George Stigler, the Nobel Prize-winning economist, neatly summarizes this difference between ethical BCA and BCA in a statement to the effect that people don't always want efficiency.<sup>51</sup> This can only be the case, however, when efficiency is defined incorrectly. The purpose of ethical BCA is to reflect actual preferences. Error aside, if there is indeed a discrepancy between calculated efficiency and what people will pay for, it must arise from ethical values not included in the efficiency calculation. In principle, there should not be a discrepancy between what people want and the results of BCA. The discovery that people may be willing to pay for goods they never expect to use, as in existence values, has created enormous controversy about the validity of counting them. Such values would count in an ethical BCA. This issue has brought the role of ethical considerations in BCA into sharp relief, but no consensus as to their proper place exists

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<sup>49</sup> David A. Dana, *Existence Value and Federal Preservation Regulation*, 28 HARV. INTL. L. REV. 343, note 16. Dana cites Kenneth E. McConnell, *Does altruism undermine existence value?* J. ENVTL. ECON. & MGMT. 32, 32–37 (1997), who suggests that to include existence value may result in double counting. However, this has been shown not to be the case. See Zerbe et al., ECOLOGICAL ECON. *supra* note 34.

<sup>50</sup> An extensive flowering of the market failure concept has occurred in the field of law. The number of law review articles and court decisions using the concept runs into the thousands, with 239 references turned up by a search of law review articles for the twelve months between June 1995 and June 1996 alone. Similarly, court decisions referring to market failure and to externalities are made with great frequency. The bankruptcy of this approach is shown in Richard O. Zerbe Jr. & H. McCurdy, *The Failure of Market Failure*, 18 J. POL'Y ANALYSIS & MGMT. 4, 558–578 (1999). Since Coase's work in 1960, the *raison d'être* for government intervention has been shifting from market failure and externalities to transactions costs.

<sup>51</sup> Ted Gayer & Robert Hahn, *The Political Economy of Mercury Regulation*, REGULATION 26 (Summer 2005).

as yet, although the weight of practice shifts ever more towards their inclusion. Thus, KHM and ethical BCA encroach upon traditional analysis.

The interesting questions are whose preferences count, which preferences count, how should they be weighted, and what are the relevant limitations?<sup>52</sup>

**Rule Two: Not everyone's preferences need to be measured in practice, but all should be considered.**

The traditional economic view is that everyone's preferences count.<sup>53</sup> This arises from economic theory in which all preferences count, and is consistent with a democratic point of view and the ethos of benefit-cost analysis. Economic welfare theory, however, typically assumes away transactions costs so that preferences are assumed to be determined at no cost.

A preferred approach is to recognize that everyone's preferences count in the sense that they need to be considered but they do not need always to be measured. To do so would be inefficient - no BCA will measure all affected preferences; it is too expensive. What is required is to reasonably measure significant preferences, to acknowledge preferences not measured, and to consider whether or not unmeasured preferences are likely to contradict the formulaic BCA test. These elements are required by reasonable principles and standards for BCA.

An ancillary rule suggests that in considering everyone's preferences greater efficiency in project development is achieved. Easterling, for example, argues that the perceived fairness of a siting process influences the level of support for a facility among

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<sup>52</sup> The only philosopher I am aware of who maintains that preferences are not values is Mark Sagoff, *supra* note 20. Sagoff's definition of values seems to be extreme Kantian.

<sup>53</sup> W.N. Trumbull, *Who Has Standing in Cost-Benefit Analysis?*, J. POL'Y ANALYSIS & MGMT. 9(2) 201-218 (1990).

the potential host community.<sup>54</sup> His survey of Nevada residents indicated they would have been more supportive of the nuclear waste repository at Yucca Mountain if they had believed that the underground repository chosen by the federal government was the best option for high-level waste and that Yucca Mountain was the safest place for such a repository.<sup>55</sup> If residents believed that these things were true, then they would be more likely to be altruistic regarding the site: they would accept “an increase in personal cost (i.e., risk) for the sake of improving the welfare of everyone else.”<sup>56</sup>

Based on his evaluation of the Yucca Mountain siting process and the results of the 1987 survey, Easterling recommends that four steps be followed in order to construct an ideal siting process. First, the process must consider all the possible options for dealing with the problem, with opportunities for a wide range of stakeholders to give their opinions. Second, there must be clear rules established for how the “best” option is chosen. For example, the criteria could be monetary cost, cultural impacts, biological impacts and economic impacts on the surrounding area. Third, the alternatives would be compared using the pre-determined criteria. Fourth, the results of the comparisons of the options are made public.<sup>57</sup>

In practice, political jurisdictions tend to confine their analyses in time or locations of their own interests. For many years, the conventional academic standard in the United States was that for U. S. projects, preferences were confined to the United States. As a practical matter BCAs performed by a political jurisdiction do not usually consider effects outside their jurisdiction. A municipal government will not normally

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<sup>54</sup> Douglas Easterling, *Fair Rules for Siting a High-Level Nuclear Waste Repository*, 11 J. POL’Y ANALYSIS & MGMT. 442 (1992).

<sup>55</sup> *Id.* at 448.

<sup>56</sup> *Id.* at 460.

<sup>57</sup> *Id.*

consider effects of its projects on another municipality. A state, unless required by law, will not usually consider effects on another state, and so forth. In fact, government BCAs often do not even fully consider, and sometimes do not consider at all, their own constituents' preferences in a project. Where significant preferences are ignored, or not considered, BCAs must be considered as politically constrained, and as not conforming to the highest principles and standards for BCA. Of course, this does not mean such analyses are not useful.

**Rule Three: Better informed individual preferences are preferred to less informed.**

Preferences may differ over time, by knowledge and by contemplation. The following example is given by Frank:<sup>58</sup>

Cornell University has two sets of faculty tennis courts, one outdoor, the other indoor. Membership in the outdoor is available for a fixed fee per season. There is no additional charge. . . . The indoor facility, by contrast has not only a seasonal fee, but also a \$15 per hour charge for court time. . . . The indoor facility opens in early October, a time when the Ithaca weather can be anything from bright sunshine and mild temperatures to blowing sleet and snow. The outdoor courts remain open . . . until early November. There is a similar 1-month overlap in the . . . spring. . . .

Having [paid for the indoor court] they must pay for the hour whether or not they use it. During good weather, almost everyone prefers to play on the outdoor courts. . . .

Here is the problem: You are committed to an indoor court at 3 p.m. on Saturday, October 20, the only hour you are free to play that day. It is a warm, sunny autumn afternoon. Where should you play, indoors or outdoors?

I find that surprising many of my noneconomist [sic] partners balk when I say that playing on the outdoor courts is the only sensible thing to do. "But we've already paid for the indoor, they invariably complain. I ask, "If both courts cost the same, which would you choose?" They immediately respond, "Outdoors.", I then explain that both courts *do* cost

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<sup>58</sup> ROBERT H. FRANK, MICROECONOMICS AND BEHAVIOR 245 (4th Ed. 2000).

the same – because our fee for the hour is going to be \$15 no matter which lace we play – indeed, no matter whether we play at all. The \$15 is a sunk cost and should have no effect on our decision. Yet, even at this point, many people seem to feel uncomfortable about wasting the indoor court we have paid for. The alternative, however, is to waste an opportunity to play outdoors, which we all agree is something even more valuable! . . .

Eventually, most people come around to the notion that it is more sensible to abandon the indoor court. . .

We would conclude (assuming Frank didn't bully his colleagues) that the correct choice in a BCA context is to play outdoors and that the additional preference over playing outdoors rather than indoors is a measure of this preference. Not all people were persuaded by Frank, only "most," however, so that for some people the avoidance of the feeling of waste engendered by playing outdoors is of sufficient negative value that they should play indoors. For these people the additional value of playing outdoors only applies when one has not already paid for playing indoors.

Informed preferences are not at all the same as expertise. Expertise is clearly not the aim of requirements that adults be informed as when, for example, when they consent to medical procedures. Expertise is often hard won, for example requiring about 10,000 hours of relevant experience in chess, violin or tennis.<sup>59</sup> I shall say that informed preferences are created when the respondent has a reasonable understanding of probable consequences of alternative actions. This is a higher standard than is often imposed in product liability, community right-to know, and medical practices where the standard is closer to information about the largest or most severe possible consequences of a choice but not always information about their probability of occurrence.<sup>60</sup> Preference may be

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<sup>59</sup> K. A. Ericsson & A. C. Lehmann, *Expert and Exceptional Performance: Evidence on Maximal Adaptations on Task Constraints*, 47 ANN. REV. PSYCHOL., 273 (1996).

<sup>60</sup> Jon F. Mertz, *An Empirical Analysis of the Medical Informed Consent Doctrine: Search for a "Standard" of Disclosure*, 2 RISK 27 (1991).

created or informed by experts. It is well established that preferences change with knowledge.<sup>61</sup> A reasonable assumption is that people would prefer to use their preferences where they are informed by knowledge than when they are not since when knowledgeable, their previous uninformed preferences are still available, but are no longer preferred.

Scholars in the field of psychology argue that, without good information, individuals and groups often make bad decisions when faced with complex issues involving uncertainties and value tradeoffs.<sup>62</sup> McDaniels, Gregory and Fields, prominent scholars in the field of public affairs, show that public involvement in decisions that involve risk tradeoffs is more successful when the participants are well informed about the technicalities of the decision.<sup>63</sup> Experiments show that, in situations where laypersons are not likely to fully understand all of the details of the risk related to the decision, a group participation process should be designed.<sup>64</sup> The participation process should allow for the decision-makers to be educated about the risks involved in the decision through informational sessions. However, their consensus should be based on their own established hierarchy of values.<sup>65</sup> These insights provided by scholars in psychology and public policy lead to the conclusion that the results of public participation in decisions involving risk assessment can be ameliorated by including well-conducted BCAs in the citizen participation process.

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<sup>61</sup> Ann Bostrom, *Risk Perceptions: "Experts" vs. "Lay People"*, 8 DUKE ENVTL L. & POL'Y F. 101 (1997).

<sup>62</sup> J. Payne, J. Bettman & E. Johnson, *Behavioral Decision-Making Research: A Constructive Processing Perspective*, 43 ANN. REV. PSYCHOL. 87 (1992).

<sup>63</sup> Timothy L. McDaniels, Rover S. Gregory, & Daryl Fields, *Democratizing Risk Management: Successful Public Involvement in Local Water Management Decisions*, 19 RISK ANALYSIS 497 (1999).

<sup>64</sup> *Id.*

<sup>65</sup> *Id.*

**Rule Four. Expert opinion is better than uninformed preference.<sup>66</sup>**

It follows reasonably from Rule Three that uninformed people will prefer the preferences of experts when they can assume that the preferences of experts would lie closer to their own informed preferences than to their uninformed preferences. There is considerable literature on the differences between expert and lay opinion.<sup>67</sup> Bostrom notes that despite the numerous value judgments and biases that can influence expert risk assessments, such assessments are nevertheless based, ideally, on specialized information the average lay person is unlikely to know or have the resources to acquire:

“Knowledge about relative frequencies, causal mechanisms, and information sources often enables experts to make predictions about risky processes that are much more reliable than uninformed judgments. Most of us would rather not try to do for ourselves the jobs we usually delegate to experts, such as nuclear engineers, doctors, auto mechanics – or even lawyers.”<sup>68</sup>

In a charming note, Paul Portney presents a fantasy in which expert opinion and citizen opinion disagree and asks what should be done.<sup>69</sup> His example presents the situation of Happyville, a city afflicted with a disease residents believe is connected to

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<sup>66</sup> For some time now, discrepancies between expert assessments and lay perceptions of risk have been observed. See Bostrom, *supra* note 61. For an expression of what we are missing in our knowledge of expert and lay estimates of risk, see Gene Rowe & George Wright, *Differences in Expert and Lay Judgments of Risk: Myth or Reality?*, 21 RISK ANALYSIS 341 (2001).

<sup>67</sup> See, e.g., Bostrom, *supra*, note 61; K. Anders Ericsson & Paul Ward, *Capturing the Naturally Occurring Superior Performance of Experts in the Laboratory: Toward a Science of Expert and Exceptional Performance*, 16 CURRENT DIRECTIONS IN PSYCHOL. SCI. 346 (2007); Michelene T. H. Chi, Paul J. Feltovich & Robert Glaser, *Categorization and Representation of Physics Problems by Experts and Novices*, 5 COGNITIVE SCI 121 (1981); James Flynn, Paul Slovic & C.K. Mertz, *Decidedly Different: Expert and Public View of Risks from a Radioactive Waste Repository*, 13 RISK ANALYSIS 643 (1993)

<sup>68</sup> Bostrom, *supra* note 61 at 106-107.

<sup>69</sup> Paul Portney, *Trouble in Happyville*, 11 J. POL’Y ANALYSIS & MGMT. 131 (1992)

contamination in the water supply. If experts find no risk attached to a particular substance in the water, yet citizens of Happyville are willing to each pay \$1,000 to get rid of it, should it be eliminated? At least two issues are raised. One, if the residents themselves pay for the treatment, surely the argument for treatment is stronger. Yet the experts would presumably predict they would be happier in the short run but quite unhappy in the longer run, when the treatment did not work. How should this be analyzed and decided?

If the residents refuse to believe the experts, should the residents' full WTP be included? What if residents are willing to pay less than experts believe they should? This repeats the original conflict and question: now the experts' estimate of the future WTP of the residents differs from their own estimate. An approach is suggested in which greater weight is given to consumers' sentiments when the belief is so widespread and common that, for example, property values are or are likely to be materially affected, and to experts' opinions; where this is not the case. This approach appears to be one reasonably consistent with an economic analysis in that beliefs that are so widely and strongly held are less likely to change quickly so that material harm is done even if this harm is only psychological.

But, what if now the town doesn't pay for it but, say the whole county? Suppose the citizens outside Happyville believe the experts. They will especially resent paying for a program they believe is worthless. Should their resentment be counted as part of a BCA analysis? Clearly it should. Such resentment is not barred by considerations of legal standing, and counting it is required by ethical BCA, which recognizes all sentiments.

There is a conflict between scientific views of risk assessment and views that emphasize the cultural and personal aspects. For example, to reduce the discretion of experts, the EPA has attempted to develop “generic guidelines” that apply to all substances. These constitute a set of standards such as the following: no thresholds in dose-response functions, assume linearity in dose response functions at low doses, cumulative lifetime exposure as measure of dose, and so forth. Pollak notes, however, that science does not resolve the issue of whether or not these rules are appropriate.<sup>70</sup> Breyer has suggested a bureaucratic structure to rationalize risk regulation across fields.<sup>71</sup> But, Pollak notes, rationality in the form of “scientifically determined” guidelines is not attainable. Rationalizing procedures and standards leads to procedures that are less subjective. More importantly, it is possible to achieve “procedural objectivity” by reducing discretion. I would add that in the long run, standards can lead to better decisions as they create pressure to improve the standards. Similarly, this approach can be a means to think about ways to bring credible reassurance to the public.

Continuing the theme, Graham and Wiener ask how risk trade-off decisions can be made more intelligently.<sup>72</sup> They suggest the answer lies in how decisions are structured. First, many risk failures are intervention failures according the authors. Why do decision makers act without accounting for the full consequences of their decisions? Another major failure lies in the presence of “omitted voices.” Politics (risk transfers and the inappropriate use of heuristics) also contribute to poor decisions. The basic solution suggested is more inclusive decision-making. The situation of Beargrass Creek gives a

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<sup>70</sup> Robert A. Pollak, *Government Risk Regulation*, 545 ANNALS AM. ACAD. POL. & SOC. SCI. 25 (1996).

<sup>71</sup> Cited in Pollak, *supra*, note 70.

<sup>72</sup> RISK VS. RISK: TRADEOFFS IN PROTECTING HEALTH AND THE ENVIRONMENT (John D. Graham & Jonathan Baert Wiener, eds., Harvard University Press 1995).

demonstration of how risk and uncertainty are accounted for in recent Corps of Engineers Studies.<sup>73</sup>

The use of expert opinion in civil and criminal trials illustrates how expert opinion is valued over uninformed lay opinion. Expert testimony is allowed where scientific, technical, or other specialized knowledge will assist the jury in understanding the evidence or determining a fact at issue.<sup>74</sup> If it is a matter a layperson can understand without the help of an expert witness, an expert witness will not be allowed. Through the use of expert witnesses at trial, the legal system supports the notion that informed expert opinion is valued over uninformed lay opinion.

**Rule Five. Where expert opinion differs from informed public sentiment, it is public sentiment that is relevant.**

It is well established that lay preferences, even if informed, will differ from expert preferences. In fact, informed public preferences often seem more nuanced and less narrow.<sup>75</sup>

In BCA public preferences are desired over the preferences of experts. What people perceive as an undesirable effect depends on their values and preferences. When a formal definition of risk is used people may disagree with it because the numerical combinations of magnitude and probabilities tend to assume equal weight for both values and preferences.<sup>76</sup> However, there is evidence that lay definitions of risk depend on more

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<sup>73</sup> COMMISSION ON GEOSCIENCES, ENVIRONMENT & RESOURCES, RISK ANALYSIS & UNCERTAINTY IN FLOOD DAMAGE REDUCTION STUDIES 72 (2000)

<sup>74</sup> FED. R. EVID. 702.

<sup>75</sup> Flynn, Slovic & Mertz, *supra*, note 67.

<sup>76</sup> *Id.*

than just the severity of the event and the uncertainty associated with that event.<sup>77</sup>

Interactions between human activities and their consequences are more complex and unique than the interactions accounted for by the average probabilities used in technical risk analyses.<sup>78</sup> Researchers conclude that risk perceptions are supported by sets of consistent beliefs, not just irrational fears and unbridled emotions.<sup>79</sup>

In the tennis example offered by Frank above, there are informed people who nevertheless prefer to play tennis indoors – presumably to avoid the sentiment of waste. The fact is that people often appear to not treat sunk costs as irrelevant – the expert recommendation – due to the desire to avoid the sensation of waste. In such cases where the respondent is informed, preferences should be taken as they lie.

The use of expert witnesses at trial is also illustrative of this rule that informed lay opinion will be valued over expert opinion. Ultimately, in any jury trial, it is the jury's decision to decide whether and to how much to value an expert's testimony.<sup>80</sup> The same is true for the judge in a bench trial. Many trials feature opposing expert witnesses, ensuring that the now-informed lay people's opinion has precedence over at least that of one expert.

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<sup>77</sup> *Id.*

<sup>78</sup> See, e.g., Baruch Fischhoff et al., *How Safe is Safe Enough? A Psychometric Study of Attitudes Towards Technological Risks and Benefits*, 9 POL'Y SCI. 127 (1978); Paul Slovic, et al., *Characterizing Perceived Risks*, in PERILOUS PROGRESS: MANAGING THE HAZARDS OF TECHNOLOGY 91, (R.W. Kates, et al. eds., 1985); Paul Slovic, *Perceptions of Risk: Reflections on the Psychometric Paradigm*, in SOCIAL THEORIES OF RISK (S. Krimsky & D. Golding, eds., 1992).

<sup>79</sup> Bostrom, *supra* note 61 at 109.

<sup>80</sup> See, e.g. Seventh Circuit, Pattern Jury Instructions, 1.21 Expert Witnesses (2005) (You have heard [a witness] [witnesses] give opinions about matters requiring special knowledge or skill. You should judge this testimony in the same way that you judge the testimony of any other witness. The fact that such person has given an opinion does not mean that you are required to accept it. Give the testimony whatever weight you think it deserves...); *Amaru v. Stratton* 209 N.J.Super. 1, 506 A.2d 1225 (1985) (jury can disregard expert testimony even absent contrary evidence).

**Rule Six. It will be efficient and consistent with BCA to ignore socially distained preferences as determined by law and custom. (The Use of the WTP and WTA are determined by Law, Norms and Customs)**

Such sentiments as envy, hatred, jealousy, malice, sadism, or the rewards of thievery or murder need not count in a BCA by the requirements of efficiency itself. Where there is law forbidding behavior this may be taken as an indication that social sentiments are strongly against giving weight to the behavior. These anti-sentiments count as well. In the absence of law, sufficient social custom may in turn be taken to provide the same result. Thus a balancing of sentiments in these cases suggests that, where law and custom dictate, those sentiments that reflect social opprobrium are outweighed and should be ignored.

As an illustration, consider this example:<sup>81</sup> Amartya, a rich man, steals a book from Derek, a poor man. Derek, who loves his book, sues for its return and costs. Derek would be willing to pay \$10 for the book, but would sell it to Amartya for \$15. Amartya, who cares very little for the book, would pay \$20 for it, but would sell it for \$22.50. At trial, a benefit-cost analyst hired by Amartya testifies that the book has more value to Amartya, because his willingness to pay exceeds Derek's. BCA would seem to suggest that giving the book to Amartya is wealth-maximizing. The Court, however, finds that because the book was stolen, it should be returned to Derek, regardless of the BCA analysis. Essentially, here, where there is a law against stealing, Amartya's WTP is outweighed by social sentiment, and therefore loses. Rule 6 then recommends, for example, that *the value of the stolen goods do not count to the thief*.

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<sup>81</sup> Zerbe, *Three Rules*, *supra*, note 48. This example is based on a re-working of an example offered by Ronald Dworkin, *Is Wealth a Value?* 9 J. LEGAL. STUD. 191, 197 (1980).

**Rule Seven: Where law and custom offer no guide then all preferences are to be counted.**

Rule Seven is ancillary to Rule Six. That is, where the discussion concerned whether or not theft *should* be illegal then thieves would have standing. This is because there is no prior understanding of a right to protection against thievery. Where the issue is the relative weight of the sentiment itself in order to decide whether or not theft should be illegal, then thieves' sentiments should be counted.

In situations where rights are undetermined the correct measure for BCA is the WTP, the payment to gain a right since there is not ownership of the right. That is, unowned goods should be sold at auction. Where rights are partial and in dispute, the correct measure of efficiency is determined by a combination of WTP and WTA of the various parties.<sup>82</sup>

Navigating this balancing and enumeration of preferences can be seen in the Supreme Court's Right to Choose jurisprudence. Highly controversial subject matter aside, the court's decisions provide several examples of balancing parties' willingness to pay to secure certain rights.<sup>83</sup> *Roe v. Wade* balances, among other things, a woman's compelling interest in her body with the state's interest in the potentiality of life.<sup>84</sup> More

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<sup>82</sup> Elsewhere I have determined the particular weight to be given to the WTP and WTA according to the benefit-cost principle in these circumstances. ZERBE, ECONOMIC EFFICIENCY, *supra* note 13.

<sup>83</sup> Though poorer women seeking to terminate a pregnancy may not be able to pay as much as wealthier women (and thus have a lower WTP, since WTP is finite and based on actual ability to pay), the Court's balancing aggregate WTP and WTA in these situations includes the moral sentiments of others and society. In essence, society's WTP to ensure access and equality to a right once established compensates for an individual's ability to pay.

<sup>84</sup> 410 U.S. 113 (1973).

recently, *Planned Parenthood v. Casey* described sentiments in terms of an “undue burden” test – determining that if a pre-termination requirement (e.g. informing a spouse or a mandatory waiting period) did not unduly burden a woman’s right to terminate pregnancy, it was allowable under the Constitution.<sup>85</sup> This decision affirmed a woman’s right to terminate pregnancy – an established right following *Roe* – but applied a comparison test for the extent to which that right had to remain completely unburdened. The undue burden test – what can be conceptualized as a change in relative rights large enough that a woman who would pay to avoid the change could not afford to – was reiterated in *Gonzales v. Carhart*, the Supreme Court’s most recent major Right to Choose decision.<sup>86</sup> The visceral majority and fiery dissent in this opinion serve as further illustration of the balancing of all sentiments in an area where rights are still being negotiated. Regardless of one’s feeling regarding the outcome of these cases, each is an example of undetermined rights or rights in dispute, and the balancing including all sentiments that accompanied the firmer establishment or clarification of those rights. The essence of judicial decision-making is just such balancing, illustrated further in other examples, such as *New York Times v. Sullivan* and *Mathews v. Eldridge*.<sup>87</sup>

**Rule Eight: Moral sentiments are to be counted as preferences in ethical BCA**

There is no reason to ignore ethical considerations in determining values. Thus, ethical BCA logically includes values represented by ethical considerations. Economists

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<sup>85</sup> 505 U.S. 833 (1992).

<sup>86</sup> 550 U.S. \_\_\_\_ (2007).

<sup>87</sup> *New York Times v. Sullivan*, 376 U.S. 254 (1964); *Mathews v. Eldridge*, 425 U.S. 319 (1976). See Thomas Armitage, *Economic Efficiency as a Legal Norm*, 7 RES. IN L. & ECON. 1 (Richard O. Zerbe, Jr., ed. 1985) for a discussion.

have increasingly improved the ability to measure moral values.<sup>88</sup> For example, charitable values may be found by examining the market for charity, as Andreoni has done.<sup>89</sup> Efficiency and the ethical values underlying it can often be found in experience – the sociological point of view. Evidence suggests that the common law tends towards economic efficiency.<sup>90</sup> Zerbe argues that the correlation between changes in the common law and efficiency is stronger when a measure of efficiency is used that includes moral sentiments.<sup>91</sup> Thus an explanation of common law tendencies utilizing ethical BCA is enhanced by attention to issues of distribution and other ethical considerations. Schorr has found that considerations of distributive justice have played an important role in the evolution of property rights.<sup>92</sup> Zerbe and Anderson found that fairness played an important role in the creation of rights in the California gold fields after 1848.<sup>93</sup> Larry Goulder recently suggested an approach that incorporates important elements of the KHM framework.<sup>94</sup> Ethical BCA using KHM codifies what has to a considerable extent been occurring in practice.<sup>95</sup> For example, the heightened environmental movement starting in the 1970s has led to legal common law approaches focused on fairness, as

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<sup>88</sup> See, e.g., Richard T. Carson, Nicholas E. Fores & Norman F. Meade, *Contingent Valuation: Controversies and Evidence*, 19 ENVTL. & RESOURCE ECON. 173 (2001), and David A. Dana, *Existence Value and Federal Preservation Regulation*, 28 HARV. INTL. L. REV. 343, n.16.

<sup>89</sup> James Andreoni, *Cooperation in Public-Goods Experiments: Kindness or Confusion?*, 85 AM. ECON. REV. 891 (1995).

<sup>90</sup> See ZERBE, ECONOMIC EFFICIENCY, *supra* note 13. See also Richard O. Zerbe Jr., *Justice and the Evolution of the Common Law*, 3 J. L. ECON. & POL'Y 81 (2006). [Herein after Zerbe, *Justice and Common Law*].

<sup>91</sup> Zerbe, *Justice and Common Law*, *supra* note 90.

<sup>92</sup> David B. Schorr, *Appropriation as Agrarianism: Distributive Justice in the Creation of Property Rights*, 32 ECOLOGY L.Q. 3 (2005).

<sup>93</sup> Richard O Zerbe Jr. & Leigh Anderson, *Culture and Fairness in the Development of Institutions in the California Gold Fields*, 61 J. ECON.HIST. 113 (2001).

<sup>94</sup> Lawrence H. Goulder, *Benefit-Cost Analysis, Individual Differences, and Third Parties*, 23 RES. L. & ECON. 67 (2007).

<sup>95</sup> See ZERBE, ECONOMIC EFFICIENCY, *supra* note 13, at 15–27.

well as efficiency. In the famous case of *Boomer*, the highest New York state court found a private nuisance but forbore to either offer the traditional injunctive relief or to leave plaintiffs uncompensated.<sup>96</sup>

The consideration of moral sentiments holds lessons for the importance of process in determining benefits and costs. *Lesbirel*<sup>97</sup> shows empirically that an offer of monetary compensation has a positive influence on an individual's support for a site, but that higher levels of compensation do not produce an additional increase in support. In other words, the level of compensation is not as important as compensation in principle.

**Rule 9: Ethical sentiments are to be counted directly and not included in the discount rate.**

There has been very considerable criticism on moral or ethical grounds of BCA's discounting of future benefits and costs. Many critics would use discount rates of zero. To combine ethical preferences with the discount rate combines two disparate things, ethical preferences and the social opportunity cost of resources.

As soon as you use a discount rate that is lower than the actual time preference of those affected, you distort the choice between projects with shorter and longer time periods. This distortion will result in smaller benefits or larger costs so that net benefits

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<sup>96</sup> *Boomer v. Atlantic Cement Co.* 257 N.E.2d 870 (N.Y. 1970)

<sup>97</sup> See Howard Kunreuther & Douglas Easterling, *Are Risk-Benefit Tradeoffs Possible in Siting Hazardous Facilities?*, 80 AMER. ECON. REV. 252-56 (1992); S. Hayden Lesbirel, *Markets, Transaction Costs and Institutions: Compensating for Nuclear Risk in Japan*, 38.1 AUSTL. J. POL. SCI. 5, 7 (2003) (noting that the most resistance to projects occurs when local communities believe there are inequities between those who will benefit and those who will accept the most risks).

are lower. Using the time preference discount rate and directly incorporating ethical preferences avoids this distortion.

In their article about risk-benefit tradeoffs in hazardous facilities sitings, Kunreuther and Easterling argue that an individual's perception of seriousness of risk to future generations caused by a potentially hazardous site significantly impacts this individual's support for a site.<sup>98</sup> Moral sentiments, in the form of concern for future generations, can be important in decisions about risk-benefit tradeoffs.

Ethical preferences can be incorporated directly as part of WTP or WTA values. Under Ethical BCA (KHM) we can give standing to ethical considerations of the present generation about future generations. This provides a solution to the ethical dilemma of the discount rate problem by acknowledging the validity of ethical concerns, while also acknowledging the values that commend use of a discount rate. Consider Table 1 below:

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<sup>98</sup> See Kunreuther and Easterling, *supra* note 97 at 255.

**Table 1: A Comparison of KH and KHM involving Future Generations\***

BENEFITS AND COSTS	[1]	[2]	[3]
	No Compensation or Mitigation Occurs (PV Billions)	Compensation Occurs (PV Billions)	Mitigation Occurs Compensation is Not Feasible (PV Billions)
Ordinary Benefits	100	100	100
Ordinary Costs	60	60	60
Harm to future Generations	0.017	0.017	[0.017]
Administrative Costs of Actual Compensation	[10]	10	infinite
Mitigation Costs	[7.5]	[7.5]	7.5
Moral Harm to Present Generation	50	[50]	[50]
KH NPV	39.983	39.983	39.983
KHM NPV	-10.017	29.981	32.5
Conclusion	Neither compensation nor mitigation appears worthwhile under KH as moral harm is ignored. The project is not worthwhile under KHM.	Compensation eliminates moral harm	Mitigation eliminates moral harm

\* A real discount rate of 3% is used to discount all figures. The .017 figure is the discounted value of future damage expressed in billions. Figures in brackets are costs not incurred in the given scenario. Note that not all figures are relevant to KH and that mitigation and compensation are substitutes so that one or the other but not both are included in the KHM calculation.

For purposes of this example, mitigation and compensation measures are assumed to completely eliminate future harm. However, mitigation does not enter the KH calculus, as the mitigation costs are less than the present value of the future harm. That is, mitigation does not occur under KH, as its costs are \$7.5 billion and it eliminates only

\$0.018 billion in harm. This occurs because KH ignores the elimination of moral harm. Similarly KH does not consider compensation, as it ignores distributional effects and the costs of compensation.<sup>99</sup> Thus, the NPV under KH is the same under all scenarios.<sup>100</sup> KH misses values and information by ignoring moral harm and the cost of actual, as opposed to hypothetical, compensation.

The analysis of the nuclear waste example is quite different under ethical BCA using KHM; the NPV for a scenario without mitigation or compensation is negative, a negative \$10 billion under KHM, instead of the positive nearly \$30 billion under KH. This is because ethical considerations are included as required by KHM, but not included under KH. When compensation or mitigation occurs, the moral harm is eliminated and the missing values are now included under KHM. Some economists object, saying that moral harm cannot exceed the present value of the future loss.<sup>101</sup> They would ask, "If the current generation can compensate future generations for \$0.017 billion, then wouldn't this represent the maximum willingness to pay?" The answer is no, for two reasons. First, the costs of compensating are clearly not \$0.017 million. The administrative costs of providing compensation so far into the future must be included, and these may well be

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<sup>99</sup> Under KH, compensation costs are hypothetical and are merely the present value of the costs of future harm, or \$0.017 billion.

<sup>100</sup> The relevant amount of compensation here is not the amount actually required for those injured to be fully compensated, rather, it is the amount of compensation the current generation thinks is correct. This information is likely obtainable through a contingent valuation survey to determine, at least in principle, the WTP or WTA of "others" who have ethical considerations about the project.

<sup>101</sup> This was an objection raised when presenting this example at the Western Economic Association Conference 2001.

enormous, perhaps infinite. The ability to provide the required long-lived institutions that would carry out compensation has been found to be improbable.<sup>102</sup>

Second, the parties deciding on compensation may not be the same parties that suffer moral harm. That is, for goods supplied by the public, there is a distinction between those who would purchase ethical satisfaction and those who make the decision to purchase it. The transactions costs of actually persuading decision makers to compensate may be prohibitive, especially since any attempt at agreement may suffer from a free rider problem.<sup>103</sup> If no purchase of ethical satisfaction occurs, one must conclude that the transactions cost of purchase is at least as great as the moral harm to the present generations.

The highest NPV under KHM is \$32.5 billion, which occurs with mitigation. The inclusion of the value of ethical considerations to reduce harm to future generations provides a justification for mitigation as long as its costs are less than the moral harm. Under KHM, rough estimates of moral harm might suffice for the correct decision. The KHM approach is superior, as it gives a truer and fuller accounting. In this example mitigation gives a KHM net present value of about \$32 billion. The use of ethical BCA-KHM accounts for all relevant values and results in a valuable project, whereas KH results in a project with a \$10 billion loss.

Under KHM we can give standing to ethical considerations about future generations. KHM allows us to correctly compare compensation, mitigation and non-

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<sup>102</sup> Thomas Leschine & Howard McCurdy, *The stability of long run institutions* (2003) (working paper, on file at the University of Washington).

<sup>103</sup> Critics of benefit-cost analysis suggest that the values individuals hold as private persons differ from those they hold for public decision-making. See Anderson, *supra* note 20 and SAGOFF, *supra* note 20. This argument, however, works better as a caution to measure the actual values than as a criticism of the methodology of benefit-cost analysis. See ZERBE, ECONOMIC EFFICIENCY, *supra* note 13.

action. It avoids projects that appear worthwhile but impose moral harm greater than their value. It provides a solution to the ethical dilemma of the discount rate problem that recognizes ethical concerns as valid and seeks an ethical solution, while at the same time acknowledging the values that commend use of a discount rate. The economic efficiency of the project will then depend on the ethical values of the present generation. For example, the present generation may feel future generations should be free of problems caused by the current generation. Evidence from Kunreuther and Easterling and from Svenson and Karlsson suggests that, at least with regard to nuclear waste disposal, individuals tend to place a high emphasis on future consequences.<sup>104</sup> On the other hand, the present generation may find that compensation for environmental harm is unwarranted, given their belief that future generations will be wealthier than the present one.<sup>105</sup> Or, the present generation may feel that future generations should be free of problems caused by the current generation.<sup>106</sup>

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<sup>104</sup> See Kunreuther & Easterling, *supra*, note 97; Ola Svenson & G. Karlsson, *Decision-Making, Time Horizons, and Risk in the Very Long Term Perspective*, 9 RISK ANALYSIS 385 (1989).

<sup>105</sup> The assumption of declining marginal utility of income with increasing income applies to distributional effects in general, as well as to short-term rates, and not just to long-term discount rates. If there is a declining marginal utility of income, then the benefits accruing to the wealthy should receive less weight. Taking into account the effect of declining marginal utility of income with wealth are better done directly through valuations of benefits and costs rather than by changes in the discount rate. That is current users can account both for their own sentiments for future generation as well as their probable increase in wealth. Attempting to use the discount rate to account for either of these can result in the wrong project choice.

<sup>106</sup> See Kunreuther and Easterling, *supra* note 97, at 252, 255; See Svenson and Karlsson, *supra* note 104, at 385. Again, it is not the amount of compensation actually required for those injured that is directly relevant here. Rather, it is the amount of compensation the current generation thinks is correct. This information could be determined, at least in principle, by a contingent valuation survey measuring the WTP or WTA of those who have ethical considerations about the project.

**Rule 10: The purpose of BCA is to furnish information to the decision process and not to make the decision.**

BCA is, however, not to be separated from political discourse so that its use raises the question of whether or not it can enhance such discussion.<sup>107</sup> In this regard, the most cogent criticism is that in attempting to portray preferences, BCA makes static what is fluid.<sup>108</sup> Preferences are formed out of human interaction and are not pre-existing values to be plucked from the brains of respondents. Decisions, however, are made in such interaction and BCA would be only one element in it. Moreover, sophisticated generators of questionnaire (contingent valuation as stated preference) studies recognize that values are created and discovered in the course of administering questionnaires. The proponents of BCA and benefit/risk analysis maintain that data from BCA can be used to enhance the relevant discussion. For example, Cook et al. examine the effect of giving respondents time to think about their stated choices in a survey of cholera and typhoid vaccine preferences in Hue, Vietnam.<sup>109</sup> Because neither vaccine is widely available in Vietnam, they use a stated preference technique and gave half of their respondents overnight to think about their choices to make the hypothetical valuation scenario as similar to a real-life choice situation as possible. Respondents who were given extra time made fewer choices that violated internal validity tests of utility theory, and had lower average willingness to pay (WTP), confirming a result found in similar studies in the contingent valuation literature.<sup>110</sup>

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<sup>107</sup> This is recognized by sophisticated critics such as Wolcher, *supra* note 25.

<sup>108</sup> Wolcher delivers a particularly trenchant and clear criticism along these lines. See Wolcher, *supra* note 25.

<sup>109</sup> Joe Cook, et al, *The Effect of Giving Respondents Overnight To Think About Their About Their Answers to a Stated Choice Survey in Hue, Vietnam*, 45 ECON. INQUIRY 100 (2007).

<sup>110</sup> *Id.*

## VI. Conclusion

Modern benefit-cost analysis has been mischaracterized by a wide spectrum of non-practitioner, mainly legal critics. Economists and users or producers of BCA in the past have chosen to remain unaware of the need to make the foundation of benefit-cost analysis clear. Yet economists have come to realize or been forced by practicality (e.g. in addressing issues of charity, and through environmental evaluation and contingent valuation where moral sentiments play a role), to see that a more inclusive view of BCA allows a wider scope for evaluations, and a more solid framework for its use. As part of the process of making the basis for BCA clearer and more useful, this article begins to develop rules and standards of practice. In doing this it shows that BCA is not a mechanical exercise but rather an art form involving nuanced judgment about what information is most useful for public policy.

In introducing ethical BCA as an art form, most criticisms of BCA are obviated. Table 2 shows briefly the criticism and the response of ethical BCA. These responses are then shown to be governed by one or more of the rules for ethical BCA introduced here.

**Table 2. Ethical-BCA Answers to BCA Criticisms**

	Criticism & Basis for Criticism	Ethical-BCA Responses	Governed by
1	BCA results reflect the existing pattern of wealth, thus the results will be unfair.	The results are unfair only if the pattern of wealth is unfair. The solution is to change the pattern of wealth, not to throw out BCA.	Rule 1
2	No weight is given to income distribution concerns and moral sentiments such as charity. Thus, BCA is morally deficient and suspect.	This is not true for Ethical-BCA as defined here.	Rule 8

3	Private values are used when community values are appropriate. The choices an individual makes as a public citizen may differ from those she makes as a private person. Thus, proper community values are missing in BCA.	The correct measure is public preferences in the context of a public project, so criticism is not true of BCA.	Rules 4, 10
4	BCA ignores moral considerations, e.g. by using discount rates to value future lives.	Not the case with Ethical BCA No legitimate moral claims are ignored with Ethical-BCA. And discount rates are still used.	Rule 9
6	BCA cannot recognize moral values without recognizing immoral ones, including “bad” utility. Thus, either immoral values are wrongly included, or moral values are omitted. BCA therefore fails to condemn rape or slavery in all cases.	This is not the case if society gains from ignoring immoral values.	Rule 6
7	BCA compares the incomparable and prices the priceless. It rests on market values. Values are aggregated improperly, and valuing moral sentiments degrades them.	Ethical BCA provides information about preferences, including Ethical or morally based ones.	Rule 8
8	Absence of any “scientific” method of aggregating preferences, e.g. since one cannot measure utility, one cannot in general say if total happiness has increased if a project increases the wealth of some more than it decreases the wealth of others.	This is a fact of nature, not of Ethical BCA. The question is whether or not Ethical BCA results in a useful metric.	Rule 10
9	BCA favors the status quo and is therefore biased against change. It assumes the existing pattern of rights so that when there is sufficient disagreement, it would choose position A if starting from A; or B, if starting from B.	This result is based on the importance of extant law and Ethical BCA’s relationship to it. Far from a failing, this is an Ethical BCA strength.	Rule 1
10	Ethical BCA may result in neglecting non-quantitative values, and as a result, it may miss important values.	This is true and can be overcome with vigilance in presentation and discussion.	Not discussed here. Consists of giving proper weight to quantitative and qualitative data.