Cost-Benefit Analysis in Federal Climate Policy

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Research Question

Should the federal government use (quantitative) cost-benefit analysis when evaluating and deciding upon climate change adaptation policy?

Topics of Interest

- CBA, its problems in addressing climate change, and alternatives
- Rethinking our ethical relationship with future generations

What is CBA?

- In simplified form (Cole 2012):

  "(1) specify the social-cost problem to be resolved-sometimes, but not always, exogenous to the CBA;
  (2) identify policy alternatives for doing so, including no action;
  (3) determine foreseeable impacts, including non-market impacts, of each of the alternatives over their expected life-spans as against some baseline;
  (4) assign [monetary] values to those impacts;
  (5) discount future costs and benefits to present-day dollars and calculate the net present benefits or costs for each alternative;
  (6) finally, compare the net benefits/costs or all alternatives and choose the alternative with the greatest net benefits or lowest net costs."

- Allocative efficiency (Boardman and Vining 2017)

Current Federal Climate Policy (1/2)

- Reagan Executive Order 12291 required CBA submitted to the Office of Management and Budget's (OMB) Office of Information and Regulatory Affairs (OIRA) (Howard 2019)
- *Center for Biological Diversity v. National Highway Traffic Safety Administration* requires agencies to include the "social cost of carbon" (SCC) (Johnson and Hope 2012)

  "NHTSA's reasoning is arbitrary and capricious for several reasons. First, while the record shows that there is a range of values, the value of carbon emissions reduction is certainly not zero." (Center for Biological Diversity v. NHTSA, 538F.3d 1172, 1200; 9th Cir., 2008)

Current Federal Climate Policy (2/2)

- Obama Interagency Working Group (IWG) on SCC proposed \$31/51/50 per metric ton of CO_2 (2010/2013/2016) (Howard 2019)
- Trump disbanded IWG, withdrew estimates, proposed SCC of \$8/1 per metric ton of $C0_2$ at discount rates of 3 or 7 percent. (Howard 2019)

How is SCC Calculated?

- In the US, the IWG used DICE (Dynamic Integrated Climate-Economy model), PAGE (Policy Analysis of the Greenhouse Effect), and FUND (Climate Framework for Uncertainty, Negotiation, and Distribution) (Masur and Posner 2011)

Technical Criticism of IWG (1/2)

- DICE/PAGE/FUND ignore certain effects (ex: ocean acidification, migration) (Masur and Posner 2011)
- FUND ignores catastrophe, DICE/PAGE may significantly underestimate it (Masur and Posner 2011)

Technical Criticism of IWG (2/2)

- Assume inexpensive adaptation, an optimistic scenario, global decarbonization, linear relationship (Masur and Posner 2011)
- Arbitrary damage functions and divergent results:

  "FUND estimates are at the extreme low end of PAGE estimates, and PAGE estimates are at the extreme low end of DICE estimates" (Masur and Posner 2011)

Subjective Judgements in CBA (1/2)

- Valuation of human mortality and non-market goods and discount rate (Cole 2012)
- Scientific uncertainty, "sensitivity" tests, and agency evasion (Masur and Posner 2011)

  *"**Cost-benefit analysis cannot cope with inherently political questions involving contested normative issues.** In some cases, such as abortion, affirmative action, and religious accommodation, the source of conflict is so clear that no one seriously argues that regulatory agencies should solve them using cost-benefit analysis. In other cases, the source of conflict is more subtle. Instead of looking to cost-benefit analysis to resolve political questions, in certain cases, **policymakers must instead make political judgments. Climate regulation falls between these two extremes.**" (Masur and Posner 2011)*

Subjective Judgements in CBA (2/2)

- Bush "Clear Skies" and "senior death discount" (Cole 2012)
- Discount rate criticism (Johnson and Hope 2012; Howard 2019; Sussman et al. 2014; Weyant 2014; Farber 2015; Golub and Brody 2017)

Extreme Uncertainty and Catastrophe

- Extreme impacts and spillover effects (van den Bergh and Botzend 2015; van den Bergh 2004)

Ethical Questions

- Distributional effects (Kelleher 2018)
- Intragenerational v intergenerational time preference (Kysar 2004)
- Subsidizing cigarette smoking—human life, loved ones, voting/buying public goods, and the future (Ackerman and Heinzerling 2002)

  "At a discount rate of five percent, for example, the death of a billion people 500 years from now becomes less serious than the death of one person today." (Ackerman and Heinzerling 2002)

Reform CBA?

- Use with skepticism and set a high SCC (Sussman et al. 2014; Weyant 2014; Howard 2019)
- Incorporate moral principles (Posner and Sunstein 2017)

Alternatives to CBA

- Cost-effective analysis (CEA)
  - Scale effects (Dittrich et al. 2016)
- Real options analysis - wait for info? (Golub and Brody 2017; Dittrich et al. 2016)
- Robust-decision making (Dittrich et al. 2016; Nassopoulos et al. 2012)
- "Qualitative CBA" (van den Bergh 2004)
  - Deciding to regulate vs setting standards (Farber 2015; Frisch 2018)

Conclusion

- Context dependent: short vs long term (Dittrich et al. 2016)
- Value-judgement and combined approaches (van den Bergh 2004; Dittrich et al. 2016; Ackerman and Heinzerling 2002)

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