

Week 5 Reading

Valuation, NPV, Benefit-Cost Analysis

1 Assignment

Read K. Arrow *et al.* [1]. It's short — read the whole thing, paying attention to the two rationales for discounting and the argument for declining discount rates.

Also read U.S. Office of Management and Budget [2]. This is the 2023 revision of federal BCA guidance. Note that it may not reflect the current administration's priorities, which makes it an interesting case study in how policy guidance evolves.

Before class: Look up how **one federal agency** (USACE, EPA, FEMA, or TWDB) conducts BCA. What discount rate do they use? What counts as a “benefit”? Come prepared to share what you found.

2 Overview

Monday's lecture introduced benefit-cost analysis as a framework for comparing decisions under uncertainty. A key component is the discount rate: how much less we value future costs and benefits compared to present ones. This choice is especially consequential for climate adaptation decisions with long time horizons.

K. Arrow *et al.* [1] review two rationales for discounting (consumption-based and investment-based) and argue that uncertainty about future discount rates leads to an effectively declining discount rate over long horizons. U.S. Office of Management and Budget [2] shows how the federal government has formalized BCA practice, though its status may shift with changing administrations. You will also compare this guidance to how individual agencies implement BCA in practice.

3 Discussion Questions

1. K. Arrow *et al.* [1] describe two rationales for discounting (consumption-based and investment-based). Which do you find more convincing for climate adaptation decisions, and why?
2. If discount rates are uncertain, K. Arrow *et al.* [1] argue this is “equivalent to a declining discount rate.” What are the practical implications of this for a 50-year infrastructure project?
3. U.S. Office of Management and Budget [2] represents one attempt to formalize how the US government practices BCA. Identify one place where the guidance addresses (or fails to address) a critique we discussed in lecture.
4. Share what you found about how a federal agency conducts BCA. How does their discount rate compare to what K. Arrow *et al.* [1] recommend? Does their definition of “benefits” capture everything that matters?
5. Consider your final project topic. What costs and benefits would you need to quantify? Which would be hardest to monetize?

4 References

Bibliography

- [1] K. Arrow *et al.*, “Determining Benefits and Costs for Future Generations,” *Science*, vol. 341, no. 6144, pp. 349–350, Jul. 2013, doi: 10.1126/science.1235665.
- [2] U.S. Office of Management and Budget, “Circular No. A-94: Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs,” Nov. 2023. [Online]. Available: <https://www.whitehouse.gov/wp-content/uploads/2023/11/CircularA-94.pdf>