

Review: The U.S. Government's Social Cost of Carbon Estimates after their First Year: Pathways for Improvement" by Robert Kopp and Bryan Migone

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^a This review reflects the thoughts of the authors, but they were informed by discussion of the paper in ECON 212 / ENVS 310 – a “journal club” style course offered jointly by the College of the Environment and the Department of Economics at Wesleyan University.

This paper is a fairly comprehensive overview of (1) the major topics involved in and (2) the major deficiencies that detract from estimates of the social cost of carbon (SCC) – in particular, estimates that have been adopted by the United States to inform a diverse set of regulatory considerations even if they have not yet informed the design of the U.S. contribution to the appropriate reduction of global greenhouse emissions. Reluctance to incorporate SCC into mitigation debates might be well founded, but that does not mean that mitigation is not a good idea. Nonetheless, (non-zero) estimates of the SCC are essential in evaluating the costs and benefits of other regulations (for which cost-benefit analysis is a more appropriate analytic tool).

The primary audience for the paper seems to be academic (and not political), since its language is relatively technical. Still, none of the seven discrete sections contains lengthy discussions of technical points through which the story might have been blurred – except perhaps for Section 5 on risk aversion (admittedly a difficult topic). Moreover, none of the sections contained any glaring errors. Indeed, the paper has a smooth outline and organization across the seven sections that allow the reader to organize his or her thoughts as different ideas and complications are brought to the fore. The last 20% of the paper ties these sections together to suggest how we might move forward to better inform the government and ourselves. The authors call for more research, as is the usual case in such papers, but they are much more specific in their recommendations than usual.

It is important to note that the limitations in the government's ability to estimate the SCC with a level of precision that many would expect were not blamed on negligence. Instead, the paper essentially explains why even those with the best of intentions find estimating even a range of social cost estimates to be an extraordinary challenge. Indeed, Kopp and Migone do little to question the basic methodology employed by those who use integrated assessment models to offer estimates (or ranges of estimates) of the SCC. In doing so, they acknowledge that

these modelers take many things for granted – not the least of which is the existence of multi-century baselines.

One of the most important points of the paper is raised shortly after the baseline (and derivative time horizon) discussion. There they highlight an “overshoot and panic” scenario that makes it clear that the baseline assumed by those who consulted with the United States envisions almost no mitigation (at least at the federal level). This is standard procedure, as Kopp and Migone note, but it is also unrealistic if one takes a reasonable expectation of how the future might unfold as a criterion for establishing a not-improbable baseline. Even myopic societies might be provoked to enact mitigation measures if climate impacts became sufficiently “apparent and severe”. Since calculations of the SCC depend most fundamentally on the baseline, might not the next round of estimates take the potential for limiting emissions into account in some of their calculations – systematically, to be sure, but not so systematically that the possibility is ignored in every case.

More generally, Kopp and Migone work from the current literature to offer carefully balanced thoughts and recommendations. They take care to note what is missing in the government’s SCC estimates even as they warn against overplaying extreme conclusions (as opposed to extreme events). They argue that “crossing an Earth system tipping point is not identical to the onset of a catastrophic climate change event (pg. 10)”. We would add, though, that cross a tipping point makes that potential more likely, on the one hand, and more expensive to avoid, on the other assuming reversibility; and so the models that can work across multiple scenarios might still see their influence.

All of these qualities make this essay worthy of publication; we certainly recommend publication, and we expect that it will likely be widely cited.

That said, we close with two thoughts from a few readers who were not interested in the technical points or the nuances of future research agendas. They read through the initial coverage of all of the limitations of SCC estimates on the first

page and wondered why there were more pages to the paper. What, they thought, is the point of discussing the results of models that so incompletely incorporate the challenges involved in contemplating how to respond to the climate change problem? And what was the most damaging omission (or commission by assumption)? The idea “that it is possible to fully replace damaged natural systems with market goods (pg. 2)”. Can we really replace the nitrogen cycle with marked fertilizer?

Clearly, the paper did not communicate to these readers; but these are the issues that bring many citizens to question the whole approach to quantifying climate-related risks. Should we not spend some attention to how best (or at least more effectively) to communicate what we know, what we don't know, and how sensitive what we think we know is to what we routinely assume about the real world and how it works? To us, this question identifies an entirely new and perhaps more significant area of research.