THE NORMATIVE SIDE OF CLIMATE ECONOMICS

REVISITING THE LITERATURE ON THE SOCIAL COSTS OF CARBON

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- Systematic literature review using the database from Tol (2024)
- Expert survey

INTRODUCTION

THE NORMATIVE SIDE OF THE SOCIAL COST OF CARBON (SCC)

The Social Cost of Carbon

- The social cost of carbon (SCC) is the (future) cost caused by the emission of one additional ton of CO2
- A higher SCC means that a more aggressive mitigation policy should be adopted
- For example, should we implement a technology to capture carbon that costs $600 per ton of CO2?
- According to a cost-benefit analysis, this technology should be implemented if the SCC is higher than $600
- Analogous reasoning applies to the adoption of a (more costly) green technology
- It is often argued that a carbon tax should be introduced at the SCC value (as a Pigouvian tax)

The Normativity of the SCC

- It is often claimed that science provides clear yardsticks for how (fast) climate policy should be implemented. In this context, the SCC appears to be an objective measure that could allow for a technical rather than a purely political decision.
- However, there is no agreement on the value of the SCC - estimates in the literature range widely: “We show that the social cost of carbon lies anywhere in between 0 and $120 000/tC.” (Anthoff et al., 2009, p. 1)
- Much of the variation in estimates is due to **normative assumptions** (Moore et al., 2024)
- The importance of the **discount rate** (intertemporal inequality) has been much debated, especially in the discussions surrounding the Stern Review (Stern, 2006; Nordhaus, 2007)
- However, accounting for spatial inequalities through **equity weights** has received much less attention, even though it makes an even more pronounced difference (Prest et al., 2024).

The Normativity of the SCC

- SCC estimates change with politics!
  Obama: $15-75
  Trump: $1-7 (Wagner et al., 2021)
  Biden: $190 (EPA, 2023)

- A key difference between the Obama and Trump administration estimates was the discount rate used (Nesje et al., 2023, p. 515)
- Moreover, Trump´s estimates only consider costs occurring in the USA (Wagner et al., 2021)

- These estimates do not use equity weights, but the Office of Management and Budget (OMB) has introduced new guidelines (Circular A-4) that allow agencies to use equity weights. Following this guideline, the SCC would be over $1300 (Prest et al., 2024).

The Utility Function and Inequality

- It is common to assume diminishing marginal utility
- This means that the same cost represents a greater loss of utility for poorer individuals than for richer individuals
- This is usually taken into account in the SCC literature in the case of intertemporal inequality: since it is assumed that there will be economic growth and that incomes will be higher, future costs are usually discounted according to the Ramsey rule: $r = \delta + \eta g$
- However, the same reasoning should apply to inequality between individuals at a given time (spatial inequality)
- Most studies only consider average income/consumption, so spatial inequality is not taken into account.

Equity weights

- Giving different weights to the costs of different people depending on their income is not a new idea in the framework of cost-benefit analysis (e.g., Arrow, 1963; Boadway and Bruce, 1984; Drèze and Stern, 1987; Layard and Glaister, 1994)

- Equity weights have also been used to calculate SCC (e.g., Pearce et al., 1996; Azar and Sterner, 1996; Fankhauser et al., 1997; Azar, 1999; Pearce, 2003)

- Adopting equity weights leads to a massive increase in the SCC estimates. Using $\eta = 1.4$, Prest et al., (2024) show that the SCC increases by a factor of 8

- To the best of our knowledge, equity weights have only been used to account for inequality between regions/countries. However, the same reasoning should apply to inequality between individuals in the same country.

Why to use Equity weights

- Not using equity weights implies a particular choice of weights (η=0): a dollar is of equal value to each person regardless of her income - that is, a linear utility function is assumed
- Although it is difficult to argue for a particular utility function, the assumption of constant marginal utility is clearly incorrect
- Without equity weights, catastrophic events occurring to poor people can appear to be compensated by a small increase in consumption of rich people

RESEARCH QUESTION

What is climate economics' attitude towards inequality?

Research question

What is climate economics' attitude towards inequality?

- What are the reasons given by the authors for including (or not) equity weights?
- Has there been a shift in the researchers' normative values with respect to inequality?

Our approach

(1) Literature review based on the database of Tol (2024)

(2) Expert survey

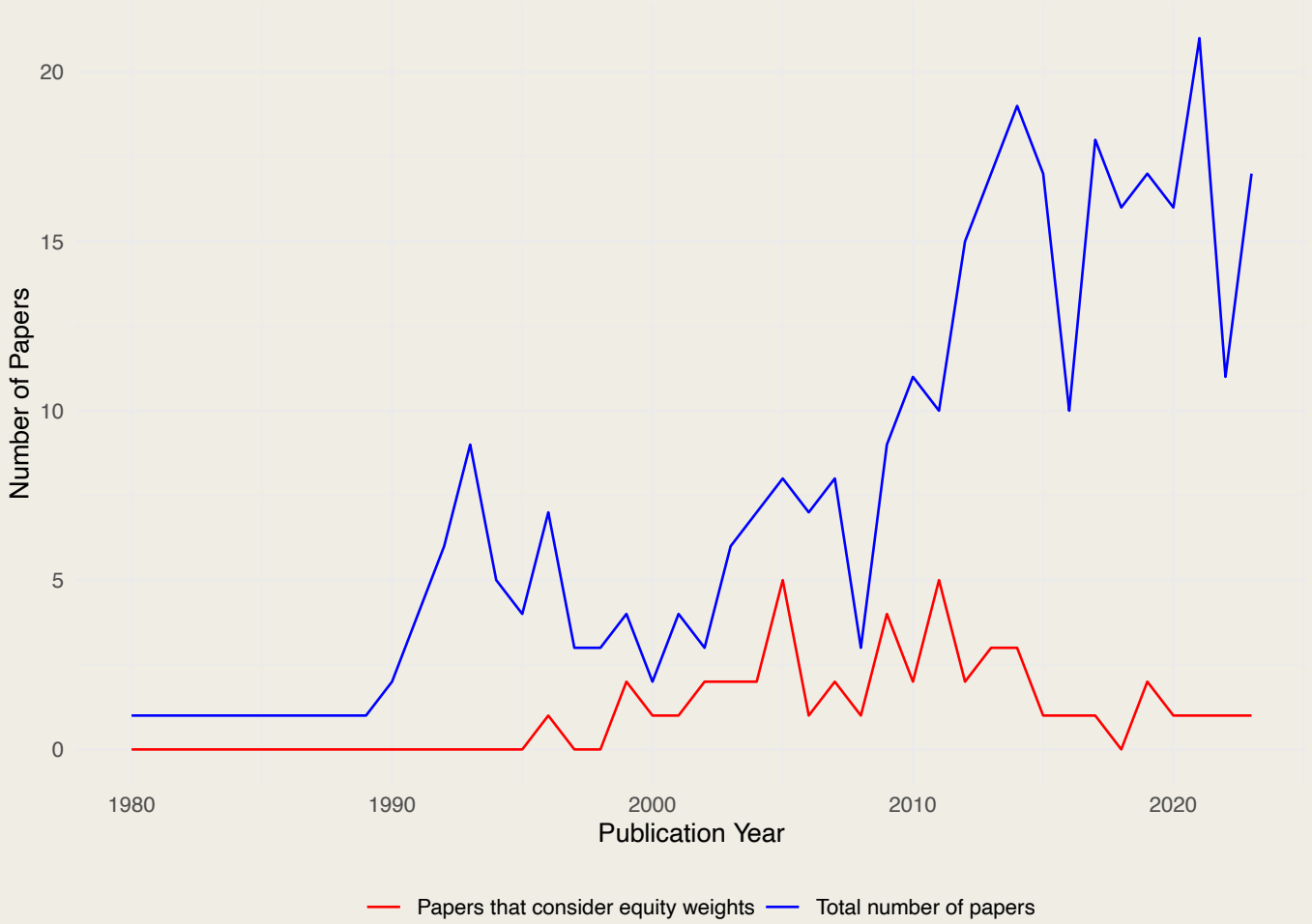
- Ask SCC experts how important distributional issues are for climate change mitigation – and how this should be addressed in the SCC approach

Data

- We use a database from Tol (2024) that contains 12,268 SCC estimates from 323 publications, including both peer-reviewed papers and gray literature
- This database includes variables such as reported SCC estimates and whether or not equity weights are used, among many others

THE SHARE OF PAPERS USING EQUITY WEIGHTS IS DECLINING SINCE THE 2000s

Source: Authors´ calculation using the database of Tol (2024)



Source: Authors´ calculation using the database of Tol (2024)

WHILE THE TOTAL NUMBER OF PAPERS ESTIMATING SCC IS INCREASING, THE NUMBER OF PAPERS USING EQUITY WEIGHTS IS CONSTANT OR EVEN DECREASING

Preliminary conclusions

(1) Normative views of scholars in climate economics substantively affect policy recommendations

(2) Reporting transparency of how much normative parameters drive SCC estimates is modest

(3) SCC estimates often disregard the importance of inequality, which may not be in line with prevailing social values.

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THANK YOU!

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