

Inequality aversion for climate policy



NAVIGATE-CHIPS STAKEHOLDER WORKSHOP
CLIMATE POLICY AND JUST TRANSITION

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Stellio Del Campo, David Anthoff, Ulrike Kornek



CHIPS

Climate Change Impacts and Policies
in Heterogeneous Societies

INTRODUCTION



Q1: How can inequality aversion be accounted for in the SCC?

- ▶ -1 € for a poor pers. $> -1 \text{ €}$ for a rich p. (Azar and Sterner, 1996; Anthoff et al., 2009; Dennig et al., 2015; Kornek et al., 2019)
- ▶ We can parametrise this preference: $\eta > 0$
- ▶ Equity-weighted SCC \neq regular SCC
- ▶ Applied in the UK and Germany

Q2: Which appropriate value for η ?

We review empirical data & normative principles to narrow down values of *static inequality aversion* for climate analyses

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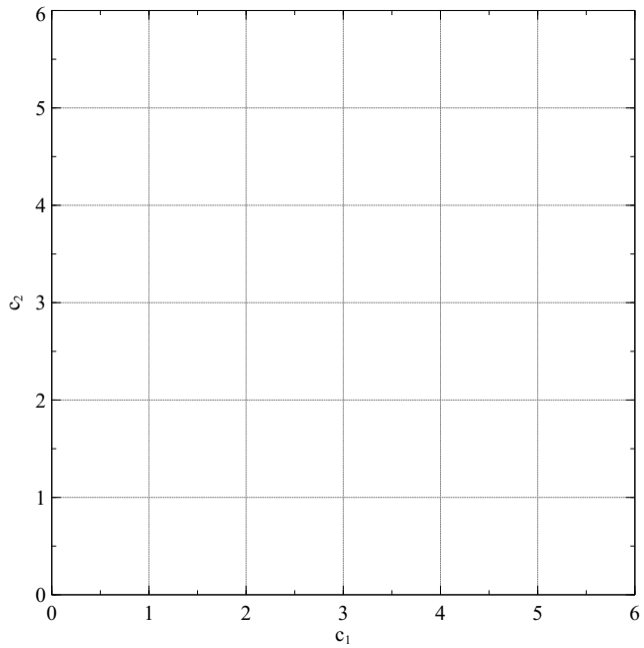
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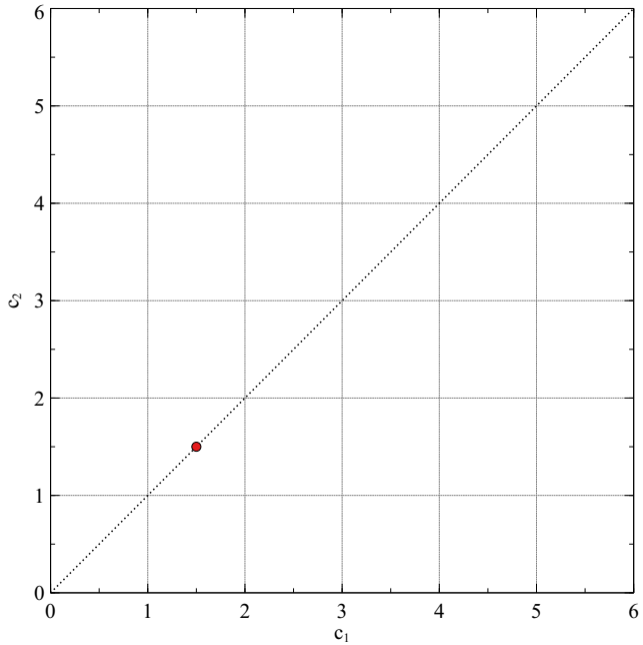
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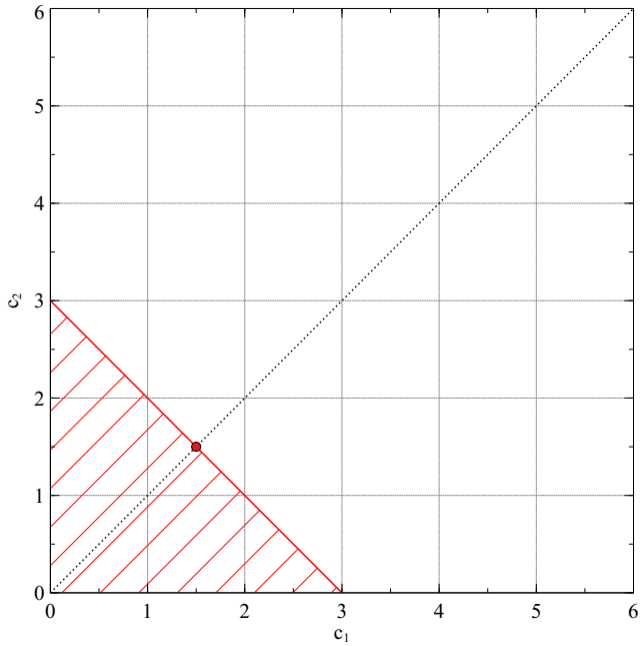
We use a constant relative inequality-aversion social welfare function (Atkinson, 1970):

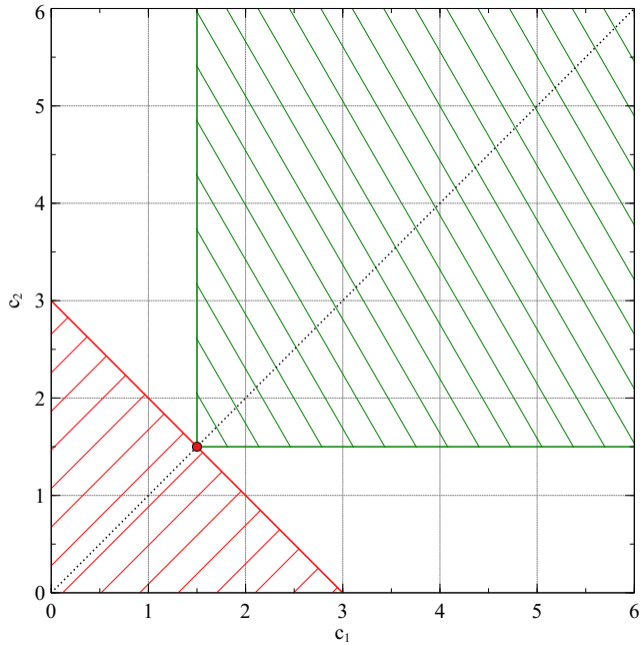
$$W(c_1, \dots, c_N) = \begin{cases} \sum_{i=1}^N \frac{c_i^{1-\eta}}{1-\eta} & \text{if } \eta \neq 1 \\ \sum_{i=1}^N \ln(c_i) & \text{if } \eta = 1 \end{cases}$$

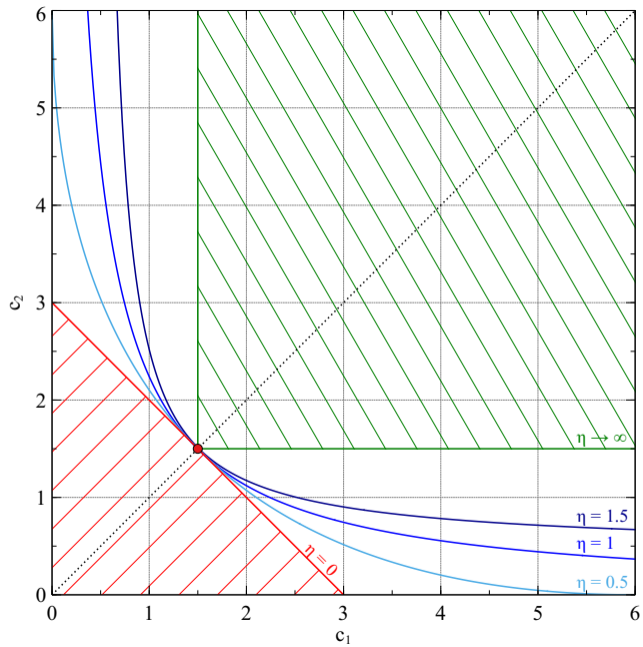
Feature: the inequality aversion value (η) sets the total-inequality trade-off

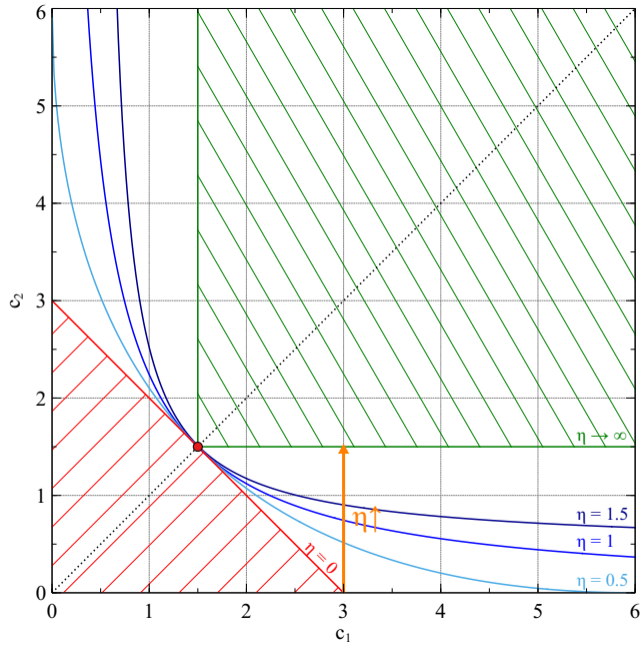














Data collection

Database_V13.xlsx - Excel

Stello Del Campo

| | A | B | C | D | E | F | G | H | I | J | K | L | M | N |
|----|----|---------|---------|-------|------------------|------|--------------------------------|---|-----------------|------------------------------|-----------------|---------------------|------|----|
| 1 | Id | Read by | Confirm | Paper | Title | Year | Authors | DOI | Journal | Type | Choice | Method | Data | Co |
| 2 | 1 | Uli | Stello | 1 | Measuring attit | 1999 | Amiel, Creedy, | https://doi.org/10.1111/j.1467-9892.1999.00111.x | Scandinavian Jc | Revealed ethics hypothetical | leaky bucket | discrete transf Au | | |
| 3 | 2 | Uli | Stello | 1 | Measuring attit | 1999 | Amiel, Creedy, | https://doi.org/10.1111/j.1467-9892.1999.00111.x | Scandinavian Jc | Revealed ethics hypothetical | leaky bucket | discrete transf Au | | |
| 4 | 3 | Uli | Stello | 1 | Measuring attit | 1999 | Amiel, Creedy, | https://doi.org/10.1111/j.1467-9892.1999.00111.x | Scandinavian Jc | Revealed ethics hypothetical | leaky bucket | discrete transf Isr | | |
| 5 | 4 | Uli | Stello | 1 | Measuring attit | 1999 | Amiel, Creedy, | https://doi.org/10.1111/j.1467-9892.1999.00111.x | Scandinavian Jc | Revealed ethics hypothetical | leaky bucket | discrete transf Isr | | |
| 6 | 5 | Uli | Stello | 1 | Measuring attit | 1999 | Amiel, Creedy, | https://doi.org/10.1111/j.1467-9892.1999.00111.x | Scandinavian Jc | Revealed ethics hypothetical | leaky bucket | discrete transf Isr | | |
| 7 | 6 | Uli | Stello | 1 | Measuring attit | 1999 | Amiel, Creedy, | https://doi.org/10.1111/j.1467-9892.1999.00111.x | Scandinavian Jc | Revealed ethics hypothetical | leaky bucket | discrete transf Au | | |
| 8 | 7 | Uli | Stello | 1 | Measuring attit | 1999 | Amiel, Creedy, | https://doi.org/10.1111/j.1467-9892.1999.00111.x | Scandinavian Jc | Revealed ethics hypothetical | leaky bucket | discrete transf Isr | | |
| 9 | 8 | Uli | Stello | 1 | Measuring attit | 1999 | Amiel, Creedy, | https://doi.org/10.1111/j.1467-9892.1999.00111.x | Scandinavian Jc | Revealed ethics hypothetical | leaky bucket | discrete transf Isr | | |
| 10 | 9 | Uli | Stello | 2 | Measuring futu | 2002 | Johansson-Sten | https://doi.org/10.1111/j.1467-9892.2002.00111.x | Economic Jourr | Revealed ethics hypothetical | leaky bucket | income distrib Sv | | |
| 11 | 10 | Stello | Uli | 3 | Choosing from | 2003 | Carlsson, Daruvala, Johansson- | https://doi.org/10.1111/j.1467-9892.2003.00111.x | Applied Econo | Revealed ethics hypothetical | leaky bucket | income distrib In | | |
| 12 | 11 | Uli | Stello | 4 | Are people inec | 2005 | Carlsson, Daruvala, Johansson- | https://doi.org/10.1111/j.1467-9892.2005.00111.x | Economica | Revealed ethics hypothetical | leaky bucket | income distrib Sv | | |
| 13 | 12 | Uli | Stello | 4 | Are people inec | 2005 | Carlsson, Daruvala, Johansson- | https://doi.org/10.1111/j.1467-9892.2005.00111.x | Economica | Revealed ethics hypothetical | leaky bucket | income distrib Sv | | |
| 14 | 13 | Uli | Stello | 5 | International in | 2010 | Tol | https://doi.org/10.1111/j.1467-9892.2010.00111.x | Climate Change | Revealed ethics actual | leaky bucket | international t Of | | |
| 15 | 14 | Uli | Stello | 6 | The social valu | 2014 | Evans, Kula, Naj | DOI 10.1111/j.1467-9892.2014.00111.x | Journal of Econ | Revealed ethics hypothetical | equal sacrifice | income taxatic Tu | | |
| 16 | 15 | Uli | Stello | 6 | The social valu | 2014 | Evans, Kula, Naj | DOI 10.1111/j.1467-9892.2014.00111.x | Journal of Econ | Revealed ethics hypothetical | equal sacrifice | income taxatic Tu | | |
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| 18 | 17 | Uli | Stello | 6 | The social valu | 2014 | Evans, Kula, Naj | DOI 10.1111/j.1467-9892.2014.00111.x | Journal of Econ | Revealed ethics hypothetical | equal sacrifice | income taxatic Tu | | |

Ready

We screened 830 papers, retained 24 papers, obtained 435 data
+ 3 studies for the axiomatic part

I. Leaky-bucket experiment

Suppose one has to transfer \$1 from a rich individual to a poor individual (known incomes). What is the maximum tolerable loss? (Okun, 1975)

II. Inverse optimum

Q: What inequality aversion fits the actual data on income taxation? (Stern, 1977)

III. Equal sacrifice

Equal sacrifice of taxpayers (Stern, 1977; Young, 1988).

Observation

The taxation is

| | | |
|-------------|----|------------|
| progressive | if | $\eta > 1$ |
| neutral | if | $\eta = 1$ |
| regressive | if | $\eta < 1$ |

Empirical data

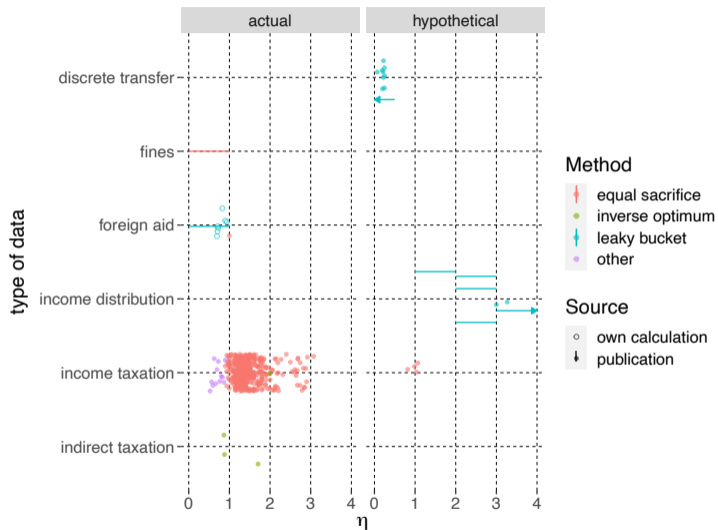


Figure: η values from empirical literature

Del Campo, Stelio; Anthoff, David; Kornek, Ulrike (2021) : Inequality aversion for climate policy, ZBW - Leibniz Information Centre for Economics, Kiel, Hamburg

| Source | η | Principle |
|--------------------------------|------------|------------------------------|
| Pigou (1912); Dalton (1920) | > 0 | Equal-preference transfer |
| Fleurbaey and Michel (2001) | > 2 | Proportional transfers |
| | ≥ 1 | Proportional trans., ex-post |
| Buchholz and Schumacher (2010) | > 1 | Solidarity |
| | $= \infty$ | Equality of consumption |
| | $= 1$ | No-envy in abs. sense |
| | $= 2$ | No-envy in relative sense |

Table: η values from axiomatic literature

| Source | η | Interpretation |
|------------------------------------|-------------|---------------------|
| Azar and Sterner (1996) | 0...3 | Equity-weighted SCC |
| Anthoff et al. (2009); Hope (2011) | 0.5, 1, 2 | Equity-weighted SCC |
| Nordhaus (2011) | 0, 1, 2 | Equity-weighted SCC |
| Dennig et al. (2015) | 2 | Equity-weighted SCC |
| Kornek et al. (2019) | 0.5, 1, 1.5 | Equity-weighted SCC |
| Anthoff and Emmerling (2019) | 0...1.5 | Equity-weighted SCC |
| UK and Germany | 1 | Equity-weighted SCC |
| Stern (2007, p. 628) | 1 | Ramsey rule |
| Nordhaus (2007) | 2 | Ramsey rule |
| Nordhaus (2014, 2018) | 1.45 | Ramsey rule |
| Weitzman (2007) | 2 | Ramsey rule |
| Dasgupta (2008) | 1.5, 3 | Ramsey rule |
| Kolstad et al. (2014) | 1...3 | Ramsey rule |



Conclusion

- ▶ Intratemporal inequality-aversion values lie generally between 0 – 3
- ▶ A value of 1 is well within the range of values that our literature review suggests
- ▶ **National redistribution:** $1 < \eta < 3$
- ▶ **International redistribution:** $0 < \eta < 1$
- ▶ This discrepancy highlights the tension existing between a *pragmatic* position and a principled *ethical* stance
- ▶ Normative principles do not point toward a precise value either. These values are not outside the range that we see in empirical evidence, but they are certainly at the higher end



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