The Social Cost of Carbon: Advances in Long-term Probabilistic Projections of Population, GDP, Emissions, and Discount Rates

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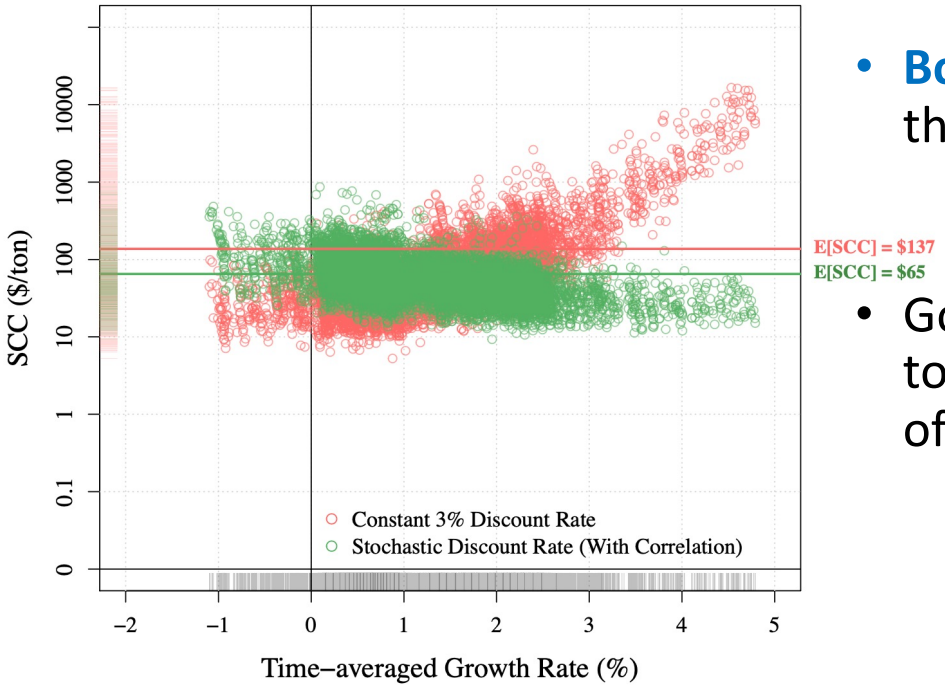
Discussion by Mar Reguant

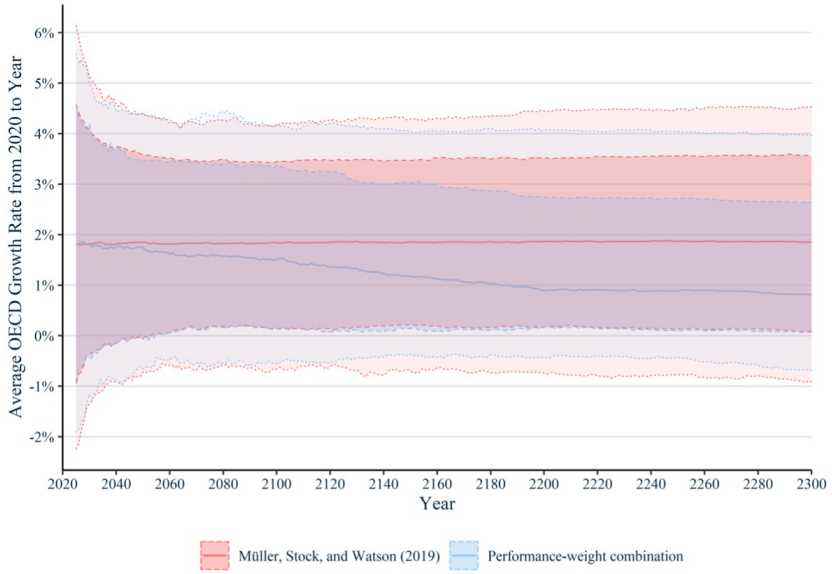
Important contributions to the SCC calculation

- This paper makes an important contribution to the updating of SCC calculations, which are crucial in policy making.
- Incorporates uncertainty of climate emissions, growth trends, and the marginal utility of income via stochastic discounting.
- **Impressive work** part of a **larger agenda**.



- **Bottom line**: Stochastic discounting puts more emphasis on the SCC during "bad" growth outcomes, which is intuitive.
  - A similar argument applies to the cross section (internally to the US, or across countries).
- Good outcomes tend to have much higher SCC values, leading to a reduction in the SCC when the decreasing marginal utility of income is considered.

Some thoughts on this (to me) counter-intuitive finding

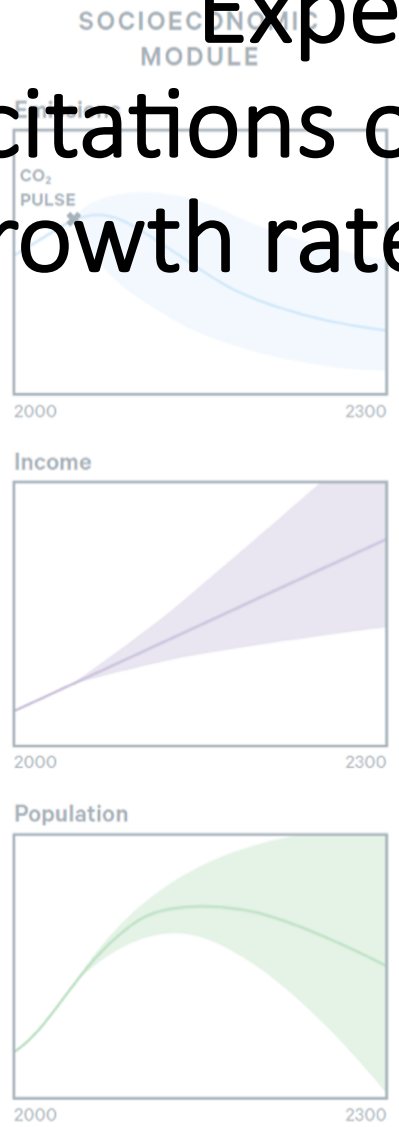


- I have to admit I was **initially surprised** by this finding: lower E[SCC] when accounting for diminishing utility of income.

Three thoughts:

1. Uncorrected SCC is larger for better outcomes.
   - How to reconcile with observed failed adaptation outcomes for low-income individuals / countries to climate change? Climate beta?
2. Growth is uncorrelated with climate.
   - Low growth when climate outcomes are bad?
3. Growth is exponential, beliefs on growth are “linear”.
   - SCC grows exponentially due to underlying assumptions that compound but gets weighted in a centered way due to beliefs.
   - Any behavioral analogy to MPG illusion?

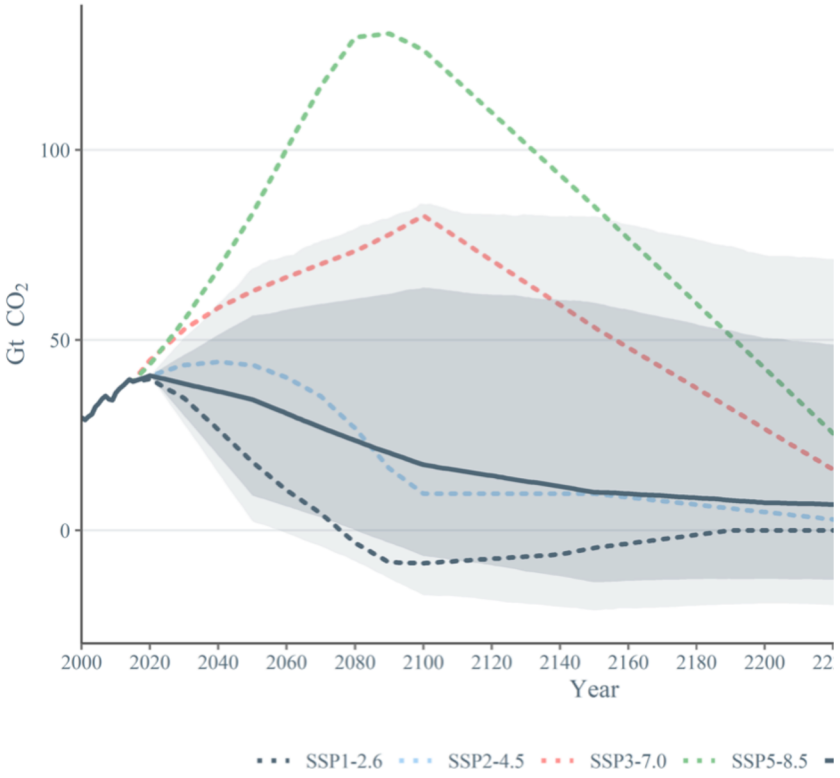
Expert elicitations on growth rates



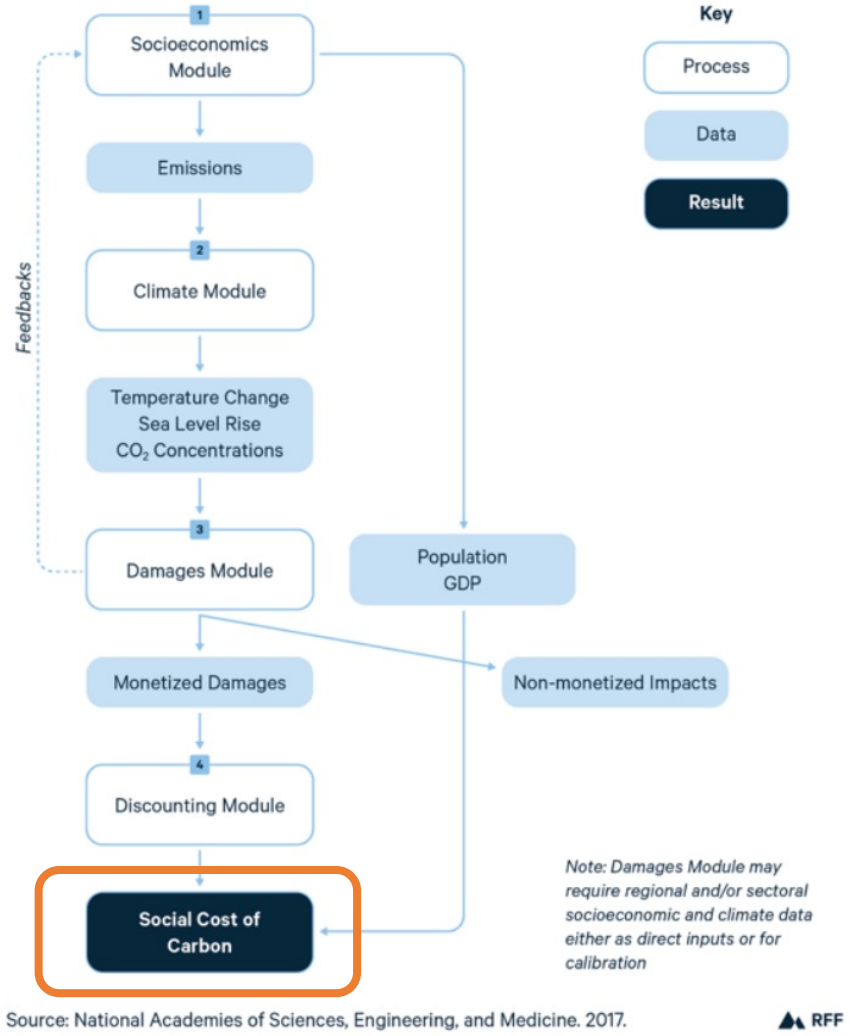
- Beliefs about population, emissions paths, and growth are exogenously determined by expert beliefs.
- In an **out-of-equilibrium trajectory** for climate, it seems like an incredibly difficult thing to forecast.
  - E.g., covid-like events can be difficult to foresee.
- That said, difficult to provide objective quantifications for such a difficult completely out-of-sample exercise.
- This might be the best possible strategy, but maybe it can be improved (in the next iteration) and include damages.

- Would it be possible to expand and incorporate correlations?
- Or maybe just expert elicitation on the **climate beta**?
  - For the paper itself, could you provide results under different climate betas to qualify the main findings?

Bridging the target vs. SCC approaches



- Stark differences in **approach** to climate policy: Europe vs. US
  - EU: Explicit physical climate goals
  - USA: Focused on SCC at federal level
- Important differences in terms of **uncertainties**:
  - SCC: what are the marginal damages in $/CO2?
  - Climate goals: what price in $/CO2 will keep us within budget?
- Necessary to bridge the **two approaches** much more explicitly:
  - At $56/tCO2e, what physical abatement can be expected?
  - Is it (internally) consistent with the elicited paths of emissions?
- From a technological point of view, a $56/tCO2e tax, even if enforced, I conjecture is inconsistent with emissions path.
  - Important missing link, not an equilibrium outcome and thus becomes less useful for cost-benefit analysis if not adequately adjusted.



Source: National Academies of Sciences, Engineering, and Medicine. 2017.

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A critical feedback loop

- Climate policy is an important source of uncertainty.
- It seems critical to include it as part of the calculation.
- Climate policy in the US articulated via the SCC, critical in affecting the path of emissions and thus, damages.

The **Result** is part of the **Process**.