Bauer et al (Nature 2020) highlights:

- Equal effort as benchmark for estalishing cooperation under Paris Agreement
- Uniform price without transfers means different efforts, defined as mitigation costs to income ratio
- International transfers or differentiated carbon prices can equalize efforts

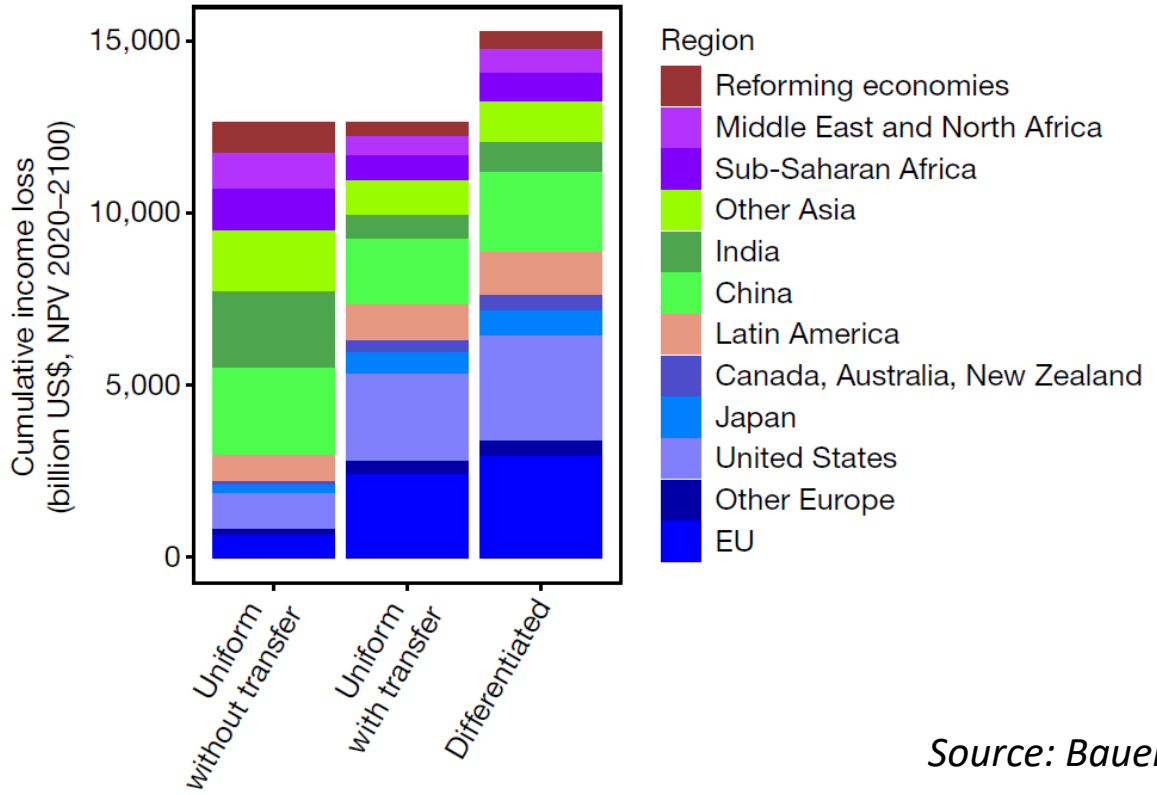
  - International transfers interfere with sovereignty
  - Differentiated carbon prices increase overall mitigation costs, and increase them heterogenously also due to leakeage

- Due to convex marginal abatement costs curves moderately differentiated carbon prices combined with low international transfers can lead to equalized efforts

Social welfare (I)

- How does the criterion of equal effort relate to global cooperation in terms of aggregate welfare?

- How do individual welfare levels compare under the different scenarios?
    - Figure 2b highlights that some regions lose while others gain under different scenarios → from an aggregate welfare perspective, it is hard to know which one is preferred



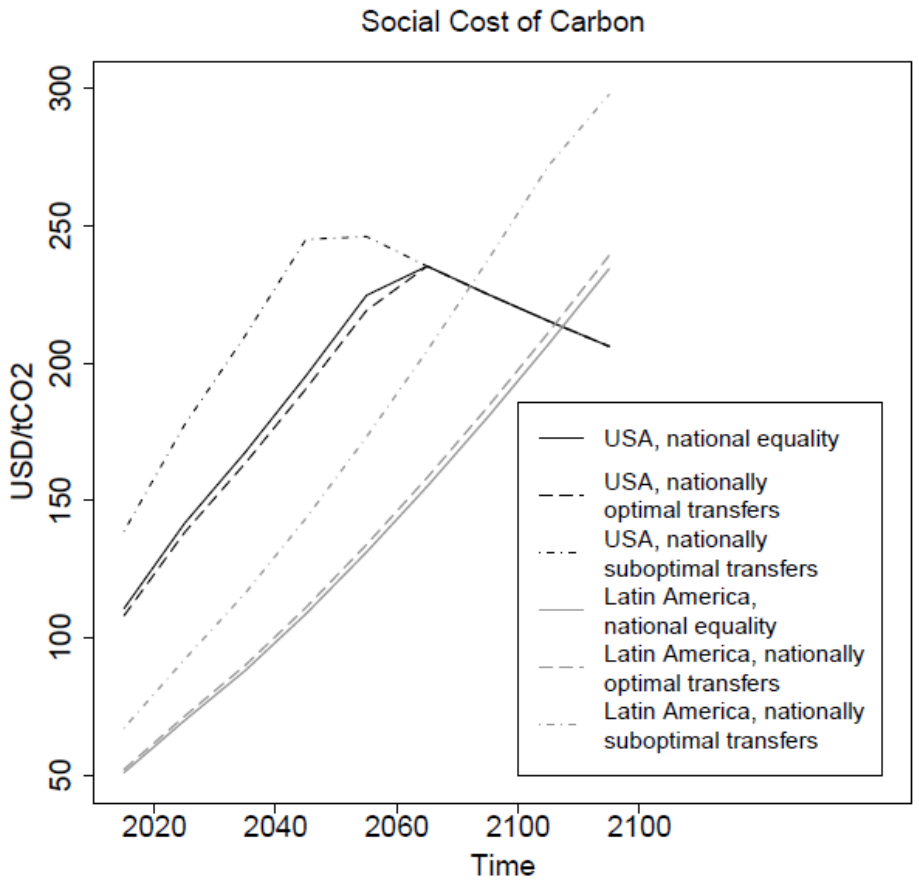
Source: Bauer et al (Nature 2020)

Social welfare (II)

- Efficiency definition: if you look at each region‘s effort, efficiency is not only about aggregate costs
    - Having transfers available gives a different set of Pareto-efficient points than in the no-transfer case → hard to compare!
    - Chichilnisky and Heal (1994): differentiated carbon prices are generally efficient and optimal without transfers
- Equal effort: how are mitigation costs and income defined? Why is income important? How is intergenerational inequality dealt with?

Social welfare (III)

- It would be great to take benefit-side into account for these questions and link to optimal carbon taxes, with and without transfers
- Also the sub-national level is important here: equal effort at household level with damages



Source: Kornek et al (JEEM 2021)

Incentives

- Are international transfers really that large? In NPV it seems big, but annually only a fraction of mitigation costs?
- Transfers based on equalizing efforts could implement „conditional commitments“: you either raise carbon price and increase effort, or you pay others for increasing their effort (Kornek and Edenhofer, EER 2020):

$$\mathcal{T}_i = \underbrace{T}_{\text{Magnitude of compensation}} \cdot \underbrace{\left(\frac{C(p_i)}{GDP_i} - \frac{1}{N}\sum \frac{C(p_j)}{GDP_i}\right)}_{\text{Differences in costs } C \text{ to GDP ratio between countries}}$$

- Kornek and Edenhofer: Cooperation enhanced, but takes benefits of mitigation as incentive into account→ how to combine with 2°C?

References

Bauer, N., Bertram, C., Schultes, A., Klein, D., Luderer, G., Kriegler, E., Popp, A., Edenhofer, O., 2020. Quantification of an efficiency–sovereignty trade-off in climate policy. Nature 588, 261–266. https://doi.org/10.1038/s41586-020-2982-5

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