Geir B. Asheim, 2017.03.30

Adapting the concept of Pareto-improvement to evaluate climate policies

Extended abstract submitted to *Subconference in Environmental Economics*
of the 8th International Research Meeting in Business and Management
(Ingmar Schumacher has OKed that I submit an extended abstract only)

Among others, Foley (2009) and then Broome in various papers, including Broome (2017), have pointed to the importance of the Pareto principle in the context of climate policies. Climate change is an externality, since those that emit greenhouse gases do not pay the long-term negative consequences of their emissions. Stern (2007) has even characterized climate change as "the greatest market failure the world has ever seen". Correcting for a market failure by internalizing externalites usually improves efficiency and provides an opportunity for realizing a Pareto-improvement whereby some parties gain without other parties losing. A Pareto-improvement is in principle possible in the climate change setting by reducing emissions *and* investments now, improving the situation both for the present and the future. One can argue that Nordhaus (2008, the DICE & RICE models) seeks to find the potential for efficiency gains, when using observed behavior to motivate discounting of poor and future people through Negishi weights and time-discounting.

The impotency of the UNFCCC process during the last 25 years, may serve as an important motivation for focusing attention on the issue of efficiency. Climate change has important distributional consequences. One might claim that, in the UNFCCC process, effective climate policies have been kept hostage in a fight for a more just world. If it is possible to evaluate climate policies in terms of efficiency only, then the issue of a just distribution can be separated from the issue for internalizing the externalites caused by emission of greenhouse gases, perhaps increasing the likelihood that effective action against climate change will be taken. See Posner and Weisbach (2010) for an interesting discussion of this position.

However, there are important reasons by the concept of Pareto-improvement cannot readily be adapted to evaluate climate policies.

1. One might not be able to realize a Pareto-improvement for all people across time, space, and uncertain states. In particular, compensation across uncertain states might be costly, as risks are systematic and insurance might not be available.
2. The present negotiators of climate policies cannot control the policies that future policy-makers will adopt. Different policies now will in fact have future distributional effects.
3. Climate policies will influence fertility, leading to a different number of future people. In particular, population policies might serve as means to reducing greenhouse gas emissions. Moreover, climate policies may lead to alternative reproductive choices, implying that different people will exist in the future; this is what philosophers call the "non-identity effect" (see Parfit, 1984). The concept of Pareto-improvement is only applicable in same people choices while, in the case of climate policies, we are faced with different people–different number choices. Golosov et al. (2007) attempt to extend the concept of Pareto-improvement to different number choices, but they essentially ignore that people will also have different identities. A possibility for facing the non-identity problem in choices with the same number of people is to rank people by their well-being and then compare the rank-ordered distributions; this corresponds to Suppes-Sen-improvement, a concept which Broome (2017) discusses in this context.

Furthermore, it is worthwhile to question whether greenhouse gas emissions leads to an inefficient allocation because it is intergenerational externality. All bequests from one generation to the next are by definition external, as the receiving generation has no way of compensating its immediate predecessors for the inheritance received, when the predecessors do no longer exist. One generation will necessarily determine the initial condition of the next. Such bequests by themselves do not cause inefficiency.

With parallel dynasties that do not interact (other than through market transactions), such intergenerational externalities cause no problem, because the composition of the inheritance of the descendants can be controlled. Thus, this does not lead to inefficiency. However, if some part of the bequest affects also other dynasties, the current representative of a dynasty does not fully control the inheritance of the descendants of its dynasty. This is indeed the case when greenhouse gas emissions are abated, as the benefits are shared by all descendants and only to a vanishing degree by the descendants in the same dynasty.

Thus, this creates room for negotiation between the current representatives of the dynasties. So perhaps the important non-internalized externalities in the context of climate change are not between one generation and the next, but between different existing dynasties. In this perspective, the externalities can be internalized by letting the current representatives of the dynasties bargain. In the climate change setting, efficiency can be achieved by negotiations between the different dynasties (at the level of world regions, nation states or smaller entities). A Pareto-improvement is possible in the sense of allowing all the current representatives of the dynasties to gain.

My paper treats the above perspectives in greater detail and poses the following questions:

- If the current representatives of different nation states negotiate and reach an efficient bargain that gains all parties, what are the normative status of such an agreement? Will the interests of future generations be respected to a sufficient degree? How should ethical concerns – in particular, relating to the interests of future generations – be handled within each nation state before entering into the negotiation?
- If the numerical modeling of integrated assessment models seeks to provide advice concerning what climate policies such an efficient bargain should encompass, what principles for Negishi weighting and time-discounting should be applied?

References

Broome J (2017). Efficiency and future generations. Mimeo, Univ. of Oxford

Foley D (2009). The economic fundamentals of global warming, in *Twenty-First Century Macroeconomics: Responding to the Climate Challenge*, Harris JM, Goodwin NR (eds), Cheltenham: Edward Elgar, 115–26

Golosov M, Jones LE, Tertilt M (2007). Efficiency with endogenous population growth, Econometrica 75:1039–71.

Nordhaus W (2008) *A Question of Balance: Weighing Options on Global Warming Policies*, New Haven & London: Yale UP.

Parfit D (1984). Reasons and Persons. Oxford: Oxford UP

Posner EA, Weisbach D (2010). *Climate change justice*, Princeton: Princeton UP

Stern N (2007). *The Stern Review on the Economics of Climate Change*. HM Treasury, London