

Risk, Inequality and Time: How Can Public Attitudes Be Incorporated Better Into The Economics of Climate Change?

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Purpose

My dissertation presents both an empirical and theoretical contribution to the field of climate change economics. On the empirical level, it investigates whether the standard economic framework's approach to risk, intra-generational inequality and inter-generational inequality is in accordance with the attitudes of the general public. The theoretical contribution is to suggest a new and richer framework that is less restrictive in the way preferences for risk and inequality are modelled.

The work is aimed specifically at informing climate policy but is also relevant for other policies where the consequences are uncertain and where the consumption levels of the affected individuals vary considerably.

Context

All existing economic analyses of climate change are based on the Expected Utility (EU) theory, which is the standard framework for analysing choice under uncertainty. EU theory employs a single utility function that simultaneously determines attitudes towards risk, intra-temporal inequality and inter-temporal inequality. Under standard assumptions, everything actually boils down to one single parameter, namely the elasticity of marginal utility of consumption (η). This parameter is the focus of my dissertation. It describes how much more money is worth when you are poor relative to when you are rich. In the current model, the value chosen η for describes simultaneously the level of aversion to risk as well as to income inequality both within and across generations.

In the debate following the publication of the Stern Review, η has been one of the most central topics. Many distinguished economists have criticised Stern for using too low a value for this parameter. The response from Stern and other economists who contributed to the Review has been to defend the choice of the specific value, but also to call for work on disentangling the three different components of η (risk, intra-temporal inequality and inter-temporal inequality). This is what my dissertation aims to do.

Incorporating public attitudes toward risk, inequality and time into the economics of climate change is important for two reasons. Firstly, the approach taken to these issues involves important value judgements that should not be monopolised by economists, ethicists and other academics. Secondly, cost-estimates of climate change impacts are highly sensitive to the approach taken. This means that the choice of optimal climate policy depends crucially on how these issues are modelled.

Survey methodology

For a number of reasons, we cannot rely on behaviour in markets to reveal public attitudes toward risk and inequality. However, this does not mean that we have to exclude the public from expressing their views. My dissertation takes the alternative approach of using a survey consisting of thought experiments to sample these attitudes. The survey was conducted online and was completed by a total of 3645 people from 92 different countries. I welcome you to try the survey yourself at: <http://hakon.red-redemption.com/index.php?sid=25>. The survey was undertaken in collaboration with my classmate Jennifer Helgeson.

The main section of the survey consisted of different choice experiments that sought to elicit respondents' aversion to risk as well as to intra-temporal and inter-temporal inequality. I designed these questions in the collaboration with Simon Dietz and Giles Atkinson (both from the LSE). Based on the choices made by each respondent, I derived parameter values for the levels of aversion using mathematical frameworks from the existing literature. All questions were posed in monetary terms and were not specific to climate change, but we designed them so that they would be as relevant to climate policy as possible without unnecessary departure from standard economic assumptions.

Other sections contained questions on demographics as well as attitudes toward politics and climate change in more general terms. I used the responses to these questions as explanatory variables in a regression in order to investigate what factors influence individual attitudes toward risk and inequality.

Main finding of survey

Analysis of the survey responses shows that attitudes differ considerably across the three different dimensions of η . The aggregated responses are distributed quite differently, and individual values for the different aversion parameters are only weakly correlated. In addition, the regressions indicate that they are linked to different demographic and attitudinal characteristics.

This suggests that the current practice of collapsing aversion against risk, intra-temporal inequality and inter-temporal inequality into one parameter is not a good framework for incorporating the attitudes of the public. Hence, a new framework that is rich enough to treat these three issues as distinct is needed. Otherwise, the policy advice produced by climate change economics will not reflect what is optimal given the preferences of the public.

A new model

In the dissertation I suggest a new theoretical framework which is developed to enable a disentangling of the three different types of aversion. It builds on models by Kreps and Porteus (1978) and Selden (1978) which disentangle risk from inter-temporal inequality. The central idea is to use three different valuation functions, instead of the single utility function used in the EU framework. The EU model is a particular case of the new model, which means that the new model is more generalised and richer. It represents a way of accommodating differences in attitudes towards risk, intra-temporal inequality and inter-temporal inequality with minimal departure from the current framework.

Future agenda

The values for the three different components of η found in this survey are not intended to be used directly in economic modelling. This is because the survey was based on a convenience sample rather than a representative sample of the general population of any country. In addition, my work has identified possible improvements to the survey. I am therefore working with my supervisor in preparing a follow-up study, which Defra has indicated interest in funding.

For bibliographical information, see the dissertation itself.