

Regarding : Tomas Kögel “On the relation between discounting of climate change and Edgeworth-Pareto substitutability”

Response to referee report 4 of 24 March 2009

Overall response

The referee report of 24 March referred to a version of my paper prior to my revision on 6 February. For this reason, many comments were not anymore relevant for the revised version. However, others suggestions were still relevant. The suggestions and my responses are as follows:

ON GENERAL COMMENTS

- 1) It had been suggested to drop the definitions of various forms of substitutability from the abstract.

This was not anymore relevant for the revised version. In the revised version there was only a definition of one form of substitutability left, which I kept in the final revision.

- 2) Regarding my introduction’s statement of the perception of the Stern Review’s assumption about the discount rate as “disrespectful” towards standard literature, it had been suggested to clarify that it is disrespectful towards the descriptive approach, but not disrespectful towards the normative approach. Further, I should clarify that the contribution of my paper would be to show that the descriptive approach may well coincide with the normative approach.

I recognised that my statement “However, the justification of a very low discount rate with ethical considerations has been heavily criticised by many economists as being paternalistic.”, by and large, already addresses the referee’s point. Therefore, I dropped my statement regarding “disrespectfulness”, as that statement seems to be unnecessary. I did not follow the referee’s suggestion to give me credit for “showing that the descriptive approach may well coincide with the normative approach” and instead preferred to maintain to give the full credit for this to Sterner and Persson (2008).

- 3) It had been suggested to drop some definitions from the text and place them into footnotes.

I believe that this criticism is not anymore that relevant for the revised version.

- 4) It had been suggested to ask a native English speaker for editing the paper.

I opted for the editor’s mentioned option to edit the English of my paper myself without help of a professional native English speaking editor.

SPECIFIC COMMENTS

- 1) It had been argued that it cannot be seen from my calculations in section 2 where I exploited my assumption that the project is sufficiently large to influence the discount rate. Further, I should reconsider or explain whether or not my first-order conditions are appropriate for the framework of non-marginal changes.

The mentioned section 2 did not anymore exist in the revised version and therefore this comment is not anymore relevant. Regarding appropriateness of my first order conditions for non-marginal changes: Possibly they were not appropriate in my original two-period discrete time framework. However, my revised version used a multi-period continuous time framework and in that framework my first-order conditions seem to be appropriate or at least to be standard.

- 2) I should reconsider whether or not my marginal conditions for the path of environmental prices is appropriate.

In the original two-period discrete time model, in which one period lasts for many decades, the marginal conditions were indeed not appropriate from a technical point of view because I used log-differentiation in their derivation, which requires to assume infinitesimal small time changes. However, I already recognised this problem before and switched therefore in my revised version to a multi-period continuous time framework, implying that this referee's suggestion was not anymore relevant.

- 3) I should explain where I exploited in section 3 my assumption that the project is sufficiently small not to influence the discount rate.

The framework of my revised version corresponds to the framework of section 3 of the original version and the comment is therefore still relevant. Indeed, I argued in the original and in the revised version that I assumed in my calculations the project to be sufficient small not to affect the discount rates. I realised that this statement was actually wrong and dropped it from the paper.

- 4) Some technical problems in section 2 had been addressed.

This is not anymore relevant because the mentioned section 2 did not anymore exist in the revised version.

- 5) It had been mentioned that the standard Ramsey approach is valid in case of non-substitutability in the Edgeworth-Paret sense.

I added to the text a footnote stressing this point (footnote 13).

- 6) It had been suggested that more can be made of the fact that substitutability over time is stronger than at a given point of time.

I recognised that possibly this implies that my assumption of instantaneous utility of different periods to be additively separable is not a valid assumption. While a suggestion to drop this assumption is interesting, I left this task to future research.

- 7) It had been suggested to discuss realistic numerical values of parameters.

I also left this task to future research. I did so because I have no clue about the correct value of the elasticity of substitution between environmental quality and consumption goods. Moreover, in light of the existence of environmental externalities, I do not yet know whether or not it is appropriate to maintain the social planner assumption for quantitative exercises.

- 8) Some technical problems to the concluding paragraph of section 4 had been addressed.

This comment is not anymore relevant, as the mentioned paragraph did not anymore exist in the revised version.

MINOR COMMENTS

- 1) It had been suggested to present the concept of substitutability and the implications of the various parameters in a table for ease of reference.

I added to the text a table (Table 1) to follow the suggestion for ease of reference for the concept of substitutability in the Edgeworth-Pareto sense.

- 2) Some technical aspects in connection to my extensive appendix had been addressed.

This is not anymore relevant, as in my revised version the appendix had not been that extensive anymore.

- 3) Change “risk avers” to “risk averse”.

Done.