

**Referee report on the manuscript "Discounting, beyond utilitarianism".**

**Main comment:**

This is an interesting paper that provides a framework for the study of social (and person-to-person) discount rates. The paper deals explicitly with risk and inequality aversion and introduces a social discount rate expression which is also linked to the population size. I believe that the approach used by the authors lies towards the correct direction of a more realistic framework for the study of social discount factors and it's worth publishing. On the other hand, two main issues will have to be dealt with in the future: The first concerns the very strict assumption that the states of the world are countable. The authors recognize the corresponding limitations (p.24, ll.3-5, along with footnote 7). The second, and more important, concerns the fact that in reality, the level of aggregate wealth depends nonlinearly to the level of inequality. In other words, while for a given level of aggregate consumption, equality yields higher aggregate utility, this level (of aggregate consumption), can be much lower than the level that corresponds to a state of the world with nonzero inequality. Under this prism, the framework of the paper inherits the static (concerning the second issue) view of the corresponding literature, and a comment would be useful.

**Other comments:**

- 1) P.4 l.4 - P.5 l.4: Better explain how you define a state of the world. To be more specific, I understand that the assumption " $\mathcal{S}$  is countable" addresses issues concerning the measurability of  $[0,1]^{\mathcal{S}}$ . However, this may be restrictive.
- 2) CORRECTION: P.6 l.17 "in formula".
- 3) P.7 l.-5: Define  $\bar{u}$ .
- 4) CORRECTION P.8 l.1 it is "former" instead of latter.
- 5) P.8 l.-7: I believe that the state of the world is not independent to the prospects  $u$  (e.g. what happens if total wealth (or utility) depends on wealth distribution?) Then there may be bounds on inequality aversion (see main comment).
- 6) CORRECTION: P.9 l.7 "For a given alternative"
- 7) CORRECTION: P.10 ll. 6-7 "It also ... sizes." Check syntax
- 8) Section 3.1: The use of the word "Axiom" usually implies that something that produces other relationships. However, Theorem 1, p,12, uses these axioms as if they have to be proved. I can understand what the authors imply but it must be written more clearly.
- 9) p.14 l.-7 "larger populations"
- 10) p. 21 ll.(-10) - (-11): Correct the definition of  $\mu^i$ .
- 11) P.23 l.2: it is  $(\mu^j, \nu, \xi)$
- 12) P.25 l.1: remove the word "suggest".
- 13) P.25 l.-5: add a comma after "third term".
- 14) P.31 First phrase of conclusions: You have to be more specific and complete. You have to re-write the phrase or add one before it.