

Interactive comment on “No way out? The double-bind in seeking global prosperity along with mitigated climate change” by T. J. Garrett

Anonymous Referee #2

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The goal of the author to develop simpler integrated assessment models relevant for climate change studies than the complex multi-parameter general equilibrium or similar models that are traditionally used is undoubtedly laudable. However, I find the model presented far from convincing. My criticisms are the following:

1) The central idea of the model is that there is a strong relation, supported by data, between fossil energy consumption and global accumulated wealth. One can, of course, develop any number of simple models that relate the dynamics of these variables to the available data, if one focuses only on these simple variables. One can then extrapolate the models into the future, with dire consequences for the future or our planet. But this is not the point of developing IAMs. We all agree that the path pursued in the past cannot be projected into the future. The point is to evaluate alternative evolution tra-

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jectories in which the relation between energy use, CO₂ emissions and global wealth are changed because investments are channeled into renewable energy and energy-saving technologies rather than simply used to expand the fossil-based system. This central question is not addressed by the model, and the question that is addressed, in the view of this referee, is not of interest.

2) But accepting that someone is indeed interested in projecting a BAU scenario using a model that is simpler than the various models used by IPCC, the model presented is deficient in many respects. Thus the central assumption that global wealth is given by the integral of GWP (eq. 7) contradicts standard economic theory. In simple economic growth models, GWP is normally set proportional to a combination of physical capital and human capital, which are the basic means of production, and both of which are proportional to global wealth. Thus global wealth is directly proportional to GDP, not to its integral value. Of course, if the growth is exponential, one can get away with the author's assumption, but this needs to be justified (for example, by discussing away depreciation rates, etc. etc.).

3) Similarly, the extensive discussion of the inflation rate is irrelevant for an economic growth model. The fact that the unit of currency used to define a given basket of goods can change with time is important for a central bank trying to control it, but for a growth model one can simply redefine the value of currency to an abstract inflation adjusted unit, and the problem goes away.

There are many more similar examples. In summary, the model tries to redefine economics. This is a valiant undertaking, but as a non-economist who is also not always happy with the way economists treat their subject, the attempt in my view is not successful. It will not convert economists or climate scientists trying to understand the interactions between climate change and the economic system to a new way of integrated assessment modeling.