Earth Syst. Dynam. Discuss., 2, C182–C183, 2011
www.earth-syst-dynam-discuss.net/2/C182/2011/

Earth System Dynamics Discussions

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

C. Herrmann-Pillath (Referee)

c.herrmann-pillath@fs.de

Received and published: 8 June 2011

I would like to emphasize that my focus on the difference between stocks and flows was not primarily motivated by economics in general, but by the author himself. It seems that the major disagreements between the author and the reviewers still relate with the original Climate Change paper. In that paper, the author himself discusses the relation between the thermodynamics and the economics and clearly states in the appendix that his wealth C is 'analogous' to capital. He then rightly states that a full conception of capital would have to include human capital, and that this relates with consumption. He has then an interesting discussion of the economic and thermodynamic uses of sandwiches, which, to me, seems to suggest a direct comparison to capital. From this follows, however, that accumulated GDP cannot be a direct measure of wealth, but

some construct of real and human capital. In the main text, the author also has formula (6) which relates production to what he calls the rate of return on C. That seems to come close to the capital/output ratio, because he defines efficiency as P/C. In the paper under debate, we have the equations (18)-(22) and (24)-(27) which establish the relevant relations, which are also shown in fig. 4. When I read the Climate Change paper for the first time, I was struck by the idea that civilization is represented as a heat engine which feeds back onto itself, in the sense of increasing thermodynamic potential. For me, it is entirely convincing to relate this rate with economic production as a flow. But then, what really counts is the feedback mechanism (as in the previously mentioned sandwich example). This feedback mechanism is the accumulation of capital, but not the integral of GDP as flows through time. So, it seems to me that the diverging views can be reconciled if the role of human capital is properly considered in the modelling exercise. It seems to me that stocks of population could be indirect indicators, evaluated at the costs of education (which would include the family), or a similar approach. Finally, one problem with GDP was also mentioned by earlier commentators on the Climate Change paper. This is that GDP only measures economic activities that are evaluated via market transactions. Using GDP data across time and countries in order to measure economic production would tacitly suppose that the ratio between market- and non-market transactions of produced goods is the same, always and everywhere, which is certainly wrong empirically.

Interactive comment on Earth Syst. Dynam. Discuss., 2, 315, 2011.