

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

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An (almost) final remark in order to reach reconciliation between Garrett and his critics. The core claim in the two papers by Garrett is that  $\lambda$  is a constant. I think that what is missing is a theoretical justification for that. The empirics is shaky for methodological reasons, if alone because GDP is a problematic measure already in the context of economics. Therefore, a theoretical argument would be needed, such that the empirical evidence can be presented as preliminary confirmation of the theory, but not as the major pillar on which the subsequent argument on CO<sub>2</sub> rests. What is the theory? I think equation (11) is crucial. If we rearrange for  $\lambda$ , we get:  $\lambda = \alpha w/P$ . So, Garrett does not really need complex arguments about wealth and accumulation, but only has to make two points. One is a physical justification for the assumption that he introduces

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already in his first paper, namely that  $\alpha$  is a constant (see eq. 1 in this paper). The other is that real production and work  $w$  grow linear proportionally. This is the reason why I think that Ayres and Warr are relevant for his work, independently from their specific production function approach. Work  $w$  is crucial in the theoretical construction presented by Garrett, because it implements the feedback loop. So, he would need to follow the track laid by Ayres and Warr to argue in terms of throughputs in useful work and energy conversion efficiency (his eq 3). In this case, he does not need to argue in terms of the integral over production through time in order to establish that  $\lambda$  is a constant. Whether that really holds, I leave to Garrett.

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

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