

## ***Interactive comment on “Comment on “Polynomial cointegration tests of anthropogenic impact on global warming” by Beenstock et al. (2012) – Some fallacies in econometric modelling of climate change” by D. F. Hendry and F. Pretis***

**Anonymous Referee #3**

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The discussion paper critically examines the study of Beenstock et al. (2012) that applied econometric techniques to the historical temperature and radiative forcing time series, and concluded that the recent global warming is non-anthropogenic. Specifically, the purpose of the ms is to “demonstrate major flaws in the statistical analysis” (Hendry and Pretis, 2013) of the original study. The ms lists several factors that can lead to erroneous results in statistical analyses, using a primitive example of road fatalities and vehicle kilometers driven as a case study. It then discusses the issues

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pertaining specifically to the Beenstock et al. (2012) analysis.

The ms makes overall valid statements. As a result, the conclusions of the original study (Beenstock et al., 2012) need indeed to be carefully re-evaluated. The ms (Hendry and Pretis, 2013) requires, in my view, only minor revisions which I discuss below.

Minor issues p2, l11-15: the use of the word “re-radiation” is somewhat confusing, it would be a good idea to clarify what is re-radiating what each time the word is used.

p5, 2.6b: what is meant by the “non-linear approximation”? Also, a reference might be in order for the statement “ $\mu$  has different values at different times, as has happened historically”.

p8, l1-5: this sentence is unclear, please consider revising. For example, what is “composition of temperature”, or what is meant by “sinks and sources”?

p8, l8-10: it might be not the best strategy to use scatterplots of  $\log(\text{CO}_2)$  vs. temperature (e.g., Figure 4) to support the points presented in the ms. Besides atmospheric  $\text{CO}_2$ , life expectancy has been increasing recently as well, but this does not suggest that life-expectancy and carbon dioxide emissions are closely related. Temperature could, in theory, still go up as it does due to internal climate cycles, or due to natural forcings. Thus, a better argument would be to reference the IPCC work showing that the warming can be explained neither by natural forcings, nor by internal climate variability (Solomon et al., 2007). In addition, the reference to Figure 4 is missing.

Tables 1 and 2: it might be useful to state what the null hypothesis is, what critical t values are, and what differencing d is implied by the results for each case. One suggestion is to format this table to look more like the tables in the Beenstock et al. (2012).

Figure 1: the formatting can be improved by adding labels and units.

Figure 4: adding labels to X and Y axes will be beneficial.

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Typos p2, l11: “the sun”.

p6, l13: missing dot.

References:

1. Beenstock, M., Y. Reingewertz, and N. Paldor, 2012: Polynomial cointegration tests of the anthropogenic impact on global warming, *Earth System Dynamics*, 3, 173-188.
2. Hendry, D. F. and F. Pretis, 2013: Comment on “Polynomial cointegration tests of anthropogenic impact on global warming” by Beenstock et al. (2012) – Some fallacies in econometric modelling of climate change. *Earth System Dynamics Discussions*, 4, 219-233.
3. Solomon, S., D. Qin, M. Manning, R.B. Alley, T. Berntsen, N.L. Bindoff, Z. Chen, A. Chidthaisong, J.M. Gregory, G.C. Hegerl, M. Heimann, B. Hewitson, B.J. Hoskins, F. Joos, J. Jouzel, V. Kattsov, U. Lohmann, T. Matsuno, M. Molina, N. Nicholls, J. Overpeck, G. Raga, V. Ramaswamy, J. Ren, M. Rusticucci, R. Somerville, T.F. Stocker, P. Whetton, R.A. Wood and D. Wratt, 2007: Technical Summary. In: *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

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