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Interactive comment on "Technical note: The Weibull distribution as an extreme value alternative for annual maxima" *by* Earl Bardsley

Anonymous Referee #1

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If I understand the paper correctly, the author focuses on a model-choice problem arising when estimating an extreme value distribution from not enough data. What might happen is that a distribution is chosen that has, e.g., a finite endpoint (EV3 in the paper) while an infinite endpoint (EV1) would be more appropriate given either knowledge of the true underlying distribution or some plausible knowledge about the nature of the observation.

To circumvent such a model risk, the author proposes to transform the data x by a suitable function g and consider y=g(x) instead. The transformation could be y=1/x for example. The new data would have a positive support and would be bounded by zero. The Weibull distribution in the sense of extremes of minima would be a (sole) candidate for fitting the transformed data for both cases, bounded and unbounded original data.

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Discussion paper

The author provides two examples.

Of course, the author reduces the model risk (EV1 vs EV3) now. But the author introduces new parameters due to the transformation g. Additionally, largely deviating extreme values (e.g., positive observation with 80, 100, 120 beeing the largest observations) will be transformed to points lying very near now (1/80, 1/100, 1/120) while the body of the data is very prominent after the transformation and highly drives the estimation results. So I wonder how this both effects the estimation accuracy and the implied accuracy of derived quantiles etc. The provided examples do not provide insight into this (and are based on a known g).

So I would like to see a thorough investigation of the applicability and precision of the idea compared to the classical approach; i.e., theoretical results and/or broad simulation study how good can we estimate/extrapolate the distribution of large values of x based on the fitting of Weibull to y=g(x). Note that model risk would also be reduced if one does not allow to fit an EV3 distribution in cases where an infinite endpoint is plausible.

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