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Interactive comment on "A water risk index for portfolio exposure to climatic extremes: conceptualization and an application to the mining industry" *by* Luc Bonnafous et al.

A. Money (Referee)

alex.money@smithschool.ox.ac.uk

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The authors have rightly identified the asymmetries that may exist in the time periods that are applied as terms of reference in the operational design level of mining facilities; and the time periods that are salient to long-term institutional investors who have exposure to the mining companies who own and operate those facilities. They have also made interesting insights into the systemic climate risks that might be embedded across the asset bases of their portfolio companies - and the paper makes that point that while these risks may not be known, they are not necessarily unknowable.

The descriptive connections that the authors make between climate variability and financial impact (p 4-5) are reasonable. However given the substantive arguments of

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Discussion paper

this paper it would have been interesting to see some empirical longitudinal dataset that considers e.g. changes in production/ output at specific mining sites, correlated to observed rainfall, with appropriate adjustments. It would help substantiate the argument that extreme rainfall has material consequences for mining outputs, with the attendant financial consequences this represents. As it stands, that assumption seems intuitively correct, but it is hard to calibrate rainfall with other effects on mining output - which is necessary to calibrate the significance of this work.

In terms of 'exceedance' data and fat tails, the results do make an interesting contribution to the discussion of systemic climate risk. The authors are however obliged to make a number of assumptions in terms of the likely financial consequences associated with 'excess exceedance' of 1 day/ 100 year and 30 day/ 10 year rainfall. These look somewhat generic, in particular assumptions of 'disruption in production' of 12.5% and 'destruction of NAV' of 10% (qualified as "likely a low number"). Applying these against the companies' revenue and asset value numbers generates a significant result - but this aspect of the methodology seems rather unsubstantiated: certainly when compared to the care given to the rainfall modelling aspect.

Overall this paper does much to help focus academic and practitioner interest on asset level impacts, and the preponderance of systemic risk. But in terms of the connections to financial value at risk, the outcomes are probably hard to substantiate. It would help to analyse longitudinal datasets of production values from different mines, correlating this with observed rainfall records. The revenue and NAV of mining companies is also highly subjective to market commodity prices, and some discussion of the salience of price volatility - relative to climate volatility - in terms of financial risk to mining companies would have been interesting to see in the discussion.

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