

Global climate change, natural disasters and property losses

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Globally, economic and insured losses from natural disasters are increasing dramatically. This presentation summarises results from a number of recent studies undertaken at Risk Frontiers to understand the causes underlying this increase, including the possible role of Anthropogenic Climate Change (ACC). This is an important issue for Risk Frontiers, which studies natural disasters with a view to helping the insurance sector better understand and price its exposure to natural catastrophes.

We begin with a re-analysis of the official Atlantic basin tropical cyclone database (HURDAT) (Chen et al., 2009); this study was undertaken at three different spatial scales – for all track segments over the entire basin; segments of tracks that made landfall on the continental US; and US landfalling segments alone. We find no systematic change in wind speed distributions at any of these spatial scales since the introduction of aircraft observations in the early 1940s. In contrast to the more recent data, the early record (1851 – 1943) has a marked and statistically significant over-representation of wind speeds largely corresponding to Saffir-Simpson Categories 1 and 2 and an under-representation of Categories 4 and 5 events; importantly, no single Category 5 event is recorded prior to 1924. Since property damage is a non-linear and increasing function of windspeed at landfall, we can be confident that increasing property losses due to hurricanes are not being driven by increases in frequency and intensity of the hazard.

In Crompton and McAneney (2008), we normalised the record of Australian historical insurance event losses (1967 – 2006) due to weather-related hazards in order to estimate likely losses should these historical events recur under 2006 societal factors. The normalisation adjusts for changes in building numbers and value and, in the case of tropical cyclones, regulated improvements in construction standards that following the destruction of Darwin by Cyclone Tracy in 1974. Once normalized in this way, weather-related losses exhibit no obvious trend over time that might be attributed to other factors, including ACC.

Lastly, Crompton et al. (2009) undertook a conceptually similar study to the above, this time looking at Australian bushfire property losses and fatalities over the period 1900 - 2009. After normalising the data to 2009 societal factors, the 2009 Black Saturday fires rank fourth in terms of property losses and second after the 1925 fire season in terms of the ratio of deaths to property losses. There is no obvious trend over time in the normalized data.

Collectively all of these studies suggest societal conditions are driving the increasing trend in disaster losses and, at least to this point in time, there is no evidence to ascribe increasing disaster losses to ACC. On the other hand, the success of improved building standards in reducing wind-induced losses from tropical cyclones is clear evidence that important gains can be made through disaster risk reduction. Moreover, land planning policies in hazard prone parts of this country that ignore the risk are inconsistent with their public safety obligations.

References

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