Reconditioning a North Atlantic Hurricane View of Risk to a Chosen Present-Day

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When evaluating a view of risk for the purposes of pricing insurance business or mitigating potential large losses, one salient question that arises is whether the view is representative of the present-day. What time-period the ‘present-day’ represents is not a trivial decision, as it very much depends on the timeframe of the business you insure. An insurer that specialises in high-frequency transactions may choose to adopt a transient short-term view of risk, whereas insurers involved with real estate (e.g. mortgages) would require a much longer, stable view of the present-day to encapsulate the longevity of their liabilities. This study presents a framework and example of reconditioning a long-term historical modelled baseline, as one might determine from any catastrophe model, for North Atlantic Hurricane towards a 5-year medium-term present-day. This study takes a data-driven compartmentalised approach to reconditioning hurricane risk, by separately adjusting storm frequency, intensity, regionality and the temporal distribution of storms (i.e. storm clustering), such that each component is explicitly accounted for. This study aims to elucidate on the most pertinent sources of uncertainty present when reconditioning a view of risk, with application beyond hurricane risk.

The results of this study suggest a coherent poleward shift in hurricane risk along the contiguous US coastline, alongside a general increase in hurricane risk. The explicit representation of clustering supports non-local inter-hurricane dependency and subsequently a change in the relationship between two key insurance metrics, the occurrence loss (max in a given year) and the aggregate loss (sum in a given year).