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Medium term hurricane catastrophe models: a validation experiment

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Climate variability is a major source of uncertainty for the insurance industry underwriting hurricane risk. Catastrophe models provide their users with a stochastic set of events that expands the scope of the historical catalogue by including synthetic events that are likely to happen in a defined time-frame. The use of these catastrophe models is widespread in the insurance industry but it is only in recent years that climate variability has been explicitly accounted for. In the insurance parlance “medium term catastrophe model" refers to products that provide an adjusted view of risk that is meant to represent hurricane activity on a 1 to 5 year horizon, as opposed to long term models that integrate across the climate variability of the longest available time series of observations.

In this presentation we discuss how a simple reinsurance program can be used to assess the value of medium term catastrophe models. We elaborate on similar concepts as discussed in "Potential Economic Value of Seasonal Hurricane Forecasts" by Emanuel et al. (2012, WCAS) and provide an example based on 24 years of historical data of the Chicago Mercantile Hurricane Index (CHI), an insured loss proxy. Profit and loss volatility of a hypothetical primary insurer are used to score medium term models versus their long term counterpart. Results show that medium term catastrophe models could help a hypothetical primary insurer to improve their financial resiliency to varying climate conditions.