



An investigation into aggregate vs. occurrence losses for European extra-tropical cyclones

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Catastrophe models are tools used primarily by the insurance industry to quantify the potential financial impact of natural disasters. Two key outputs from a catastrophe model are the aggregate and occurrence losses by return period. Aggregate losses are the total losses in any given windstorm season whereas occurrence losses are the maximum losses in a given windstorm season. Robust cat models for the European extra tropical cyclone catalogue allow for aggregate losses to be larger than occurrence losses particularly because there tend to be several ETC events in a given winter season and hence a notable difference between the largest loss and the total loss.

Such information is vital to informing the purchase of reinstatements on a reinsurance program since knowledge of whether a large loss in a year is likely to be say twice the maximum limit purchased by an insured can determine whether that insured is adequately protected in the event of a series of large catastrophe losses in a given year. Such information therefore can help companies stay solvent and ultimately provides a social benefit through ensuring policyholders affected by disasters will be paid by their still solvent insurance companies.

This paper describes the relationship between aggregate and occurrence losses both historically and as obtained from a cat model. The analysis shows that the aggregate/occurrence ratio tends to be higher for larger countries and lower as the return period under consideration increases. Also the aggregate/occurrence ratio tends to decrease when moving from Atlantic coast countries to those in central Europe.