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Geospatial Metrics for Insurance Risk Concentration and Diversification

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Abstract

(Re)insurance practitioners view geospatial variability of insurable losses and claims as a significant risk factor in the definition of key business processes and their outcomes. This second-order, volatility type of risk factor impacts the construction of insurance rates and reinsurance treaty premiums, the computation of reserve capital and the management of concentrations of physical and financial risk. With increased industry emphasis on analytics, modeling and measuring of all types of physical and financial variability and volatility, both temporal and geospatial, new efforts are needed to enrich the scope of metrics that capture the nature of second-order risk.

In its first generation, second-order metrics are pairwise by nature. Significant effort by academics and practitioners is under way to develop a new generation of such metrics, which capture and express the complexities of concentration and interconnectedness of multiple risk factors that are physical, geospatial and financial in nature. Clarity of and intellectual discipline in the definition of second-order geospatial risk metrics helps (re)insurance practitioners to adopt these statistical and computational methodologies effectively and promptly. Further, clarity, consistency and coherence of second-order geospatial risk metrics allows practitioners to relate them efficiently to the main business workflows of (re)insurance firms, to apply them in effective measurement when mitigating and hedging situations, and to promulgate them easily to executive-level decision makers.

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