

Stochastic modelling of catastrophe risks in DFA models

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Abstract

Negative developments on the capital markets at the beginning of the millennium along with the increase in natural catastrophes and terrorist attacks have substantially altered the risk situation of the insurance industry. Insurance companies have reacted to the altered prevailing conditions with a paradigm shift in corporate strategy developing from classical turnover orientation to *value- and risk-based management*. Companies will only be able to assess the level of risk capital and moreover the complete distribution of results according to corporate risk structure with the help of high-quality internal models – DFA models – matched as closely as possible to the risk situation of the individual company. Measuring and evaluating catastrophe risk has come to be a very important issue, as a substantial share of the company's entire risk capital is committed to natural catastrophes. Whether or not internal models can be applied depends largely on adequate catastrophe risk modelling. The following study aims to present two actual approaches in modelling loss due to natural catastrophes taking storms as an example. Both models use results from natural risks models. The first method is based on processing complete event loss tables, while the second mathematical statistical approach uses information from certain return periods. Both methods will be compared using example data, and their advantages and disadvantages will be pointed out as applicable to value- and risk-based management. Finally, the study will calculate risk capital, and test the impact of strategies on risk capital requirement.

Keywords: Internal models, catastrophe risk, storm risk, natural risk models, event loss tables, mathematical statistical models, risk capital, value- and risk-based management

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