

INSURANCE SPECIAL

RMS

How do models for natural catastrophes differ from those for terrorism catastrophes? What are the challenges posed by both? In what way are the models alike and how do they differ? How much of terrorism catastrophe risk is currently being transferred to the capital markets? Prospects and potential for investors?

Answered by Peter Ulrich, Senior Vice President of Model Management at RMS



The framework used to model terrorism risk is similar to that of natural catastrophes. Three separate modules are developed to assess the risk:

1. **Hazard module:** what is the likely frequency and severity of the natural catastrophe or terrorist attack
2. **Vulnerability module:** given the occurrence of a natural catastrophe or terrorist attack, what are the likely damages to the exposed buildings given proximity to the event, and construction characteristics of the buildings, and what are the expected human casualties from the event.
3. **Financial module:** given the property damage and human casualties computed in the vulnerability module, the financial module translates these into dollar losses to the policyholder, insurer(s) and reinsurer(s)

By definition, catastrophic events occur relatively infrequently and thus data with which to build models can be scarce in some instances. Approximately two US hurricanes make landfall each year and RMS was able to collect over USD20 bn in loss data for use in calibrating our model. However, in the case of New Madrid earthquake risk, it has been almost 200 years since a major event.

A common misconception is that there is very little data with which to build a US terrorism model due to the fact there have only two major successful *jihadi* attacks on US soil (1993 World Trade Center bombing and the 9/11 attacks). However, RMS has collected a significant body of data for use in building a terrorism model for the US.

- **Compilation of a database of 20,000 *jihadi* terrorist attacks around the world:** mining this data reveals distinct tendencies in terrorist attacks.
 - **Type of cities attacked:** capital city vs. major city vs. other
 - **Type of terrorist targets:** office building, infrastructure, consulate, airport, tourist attraction, etc.
 - **Type of weapons:** likelihood of different weapons (bombs, airplane hijacking, sabotage, CBRN) along with magnitude of weapon (1-ton bomb vs. 5-ton bomb)
- **Interdicted attacks in the US:** close to 30 known attacks have been interdicted in the US since 9/11. Analysis of these provides insights into terrorist capabilities in the US (frequency of attempted attack) along with targeting and weapons tendencies

To date there has only been one capital markets terrorism deal – the 2006 FIFA Golden Goal transaction. RMS performed the analysis supporting the deal which was put in place to cover the potential for the World Cup being cancelled due to a terrorist attack. While there haven't been subsequent capital market transactions, there certainly are a number of insurers exploring the possibility, and the decision on TRIEA - could make a major impact here. If TRIEA is not extended, there will be an extreme and immediate shortage of terrorism reinsurance, and insurers will be looking to the capital markets for capacity.

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