



Soapbox - Thinking outside the black box.

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Catastrophe models are often criticised for being 'black boxes', but companies can do more to improve the efficacy and transparency of the risk management process, argues Karen Clark.

Hurricane Katrina clearly demonstrated the limitations, uncertainties and inaccuracies in the catastrophe models. While the modellers utilise all available scientific information about catastrophes, that information is limited. There are significant gaps in scientific knowledge and a great deal of uncertainty that no amount of model updating will eliminate. What scientists don't know is at least as much as they do know.

The events of the past few years also highlighted significant issues with the exposure data being supplied to the models. For most companies, the exposure data is not complete or accurate enough to derive highly credible catastrophe loss estimates. The catastrophe models have been able to accept detailed property characteristics, such as roof type, window protection, etc. for over a decade, but except for a handful of companies, this information is not being collected and stored for use in the catastrophe models.

NOT DEFINITIVE

Despite all of these known problems, many companies treat the model-generated loss estimates as definitive answers or facts. Even the rating agencies ask companies to provide their raw model output such as the 100- and 250-year return period loss estimates. Our biggest problem today is not garbage in, garbage out, it's garbage in, gospel out.

This is happening in part because, depending on the size of the company, just the process of obtaining an overall enterprise-wide EP curve and PML estimates can take up to a year in calendar time, and many person years in terms of staff time. When this expensive and laborious process is done, who would even think of questioning or changing the numbers - even if they don't look right?

The models are general tools based on many simplifying assumptions, and the model-generated loss estimates can lack credibility on a specific book of business for many reasons. One best practice is to benchmark the model results to test them for credibility using other available information. For example, no one should have been surprised by the \$40bn industry loss caused by Katrina.

PREVIOUS FORM

In 1992, Hurricane Andrew hit south of Miami near a town called Homestead. Andrew caused over \$15bn in insured losses and there was a clear recognition at the time that had Andrew made landfall 30 miles north, the losses would have been four times higher or closer to \$60bn. Adjusted to 2005, Andrew going through Miami would have caused over \$100bn in insured losses. You didn't need a model to know, even as early as 1992, that \$40bn losses and much larger were on the horizon. For many companies, simply applying their market shares to the industry loss would have given them better estimates of their actual Katrina losses than their detailed catastrophe model results.

SETTING THE BENCHMARK

Benchmarking analyses can be performed, not to replace the models, but to test if the results are credible. This is **thinking outside the black box**. Senior executives and boards of directors may

never understand what's inside the black boxes, but they can make sure they understand what's coming out of those black boxes before putting their companies at risk and using information that may not be reliable.

The exposure data provided to the catastrophe models is used for decisions that impact the financial solvency of insurance companies. Yet that data is not publicly available, is not part of financial reporting and is not being audited by independent third parties. Investors and other stakeholders are beginning to recognise the need for external expert review of company data and internal data processes.

The modelling process itself is very complex and there are many places where things can go wrong. Steps that seem simple are not. Just mapping internal construction and occupancy codes to the model codes is problematic and subject to interpretation and error.

The models are necessary but not sufficient for effective catastrophe risk assessment and management. To date, most of the focus has been on the models but now it's time to get other important components of the process in place. It's time to start thinking outside of the black box.

- Karen Clark is the CEO and founder of catastrophe modelling consultancy Karen Clark & Company.