

**Presentation of Birny Birnbaum
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**NAIC Property Casualty (C) Committee Hearing
Regulation of Computer Catastrophe Models**

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My name is Birny Birnbaum and I am Executive Director of the Center for Economic Justice (CEJ). CEJ and the Consumer Federation of America sent letters to the Presidents of the NAIC in early 2006 and early 2007 identifying a number of troubling regulatory and consumer issues related to the practices of catastrophe modeling firms. Bob Hunter discussed some of the issues in our letters and I attach those letters to my testimony for the record.

Let me make an important point up front. CEJ is not opposed to computer catastrophe modeling. We embrace scientific innovation to identify risk exposure and loss prevention and loss mitigation opportunities.

The question, however, is whether there should be some regulatory oversight of the catastrophe modelers' activities and their products that are used by insurers. The simple fact that insurers rely on catastrophe models to justify massive rate hikes and nonrenewals of customers. These outcomes have dramatic impacts on the availability and affordability of insurance and clearly justify some regulatory oversight.

It is clearly only anti-regulation ideologue who can argue that insurance regulators charged with protecting consumers, ensuring competitive markets and prohibiting anti-competitive behavior should not have anything to do with cat models or cat modeling firms.

We are not talking about products that consumers can simply stop using in response to price increases. We are talking an essential protection for long-term investments in long-life assets that make demand inelastic in the short term.

Cat Modelers as Advisory Organizations

First, with its McCarran Ferguson antitrust exemption, insurers engage in collective pricing decisions through advisory organizations that are specifically regulated by the states. States require the Insurance Services Office (ISO) to register as an advisory organization and file its loss costs for review by the states with full transparency of how these loss costs were developed. But, by being a mechanism for collective pricing, advisory organizations clearly have the potential for anti-competitive activity.

RMS says that their models are developed independently, yet, their March 2006 report states clearly that RMS consulted with industry users of their models in the development of their models. See our letter of March 2006.

Why are the cat modelers not regulated as advisory organizations? The cat modelers and ISO perform identical functions – they collect data from insurers, analyze those data with other information and produce advisory loss costs. And in many states, the portion produced by cat modelers – the cat load portion of losses – is now greater than the non-cat losses provided by ISO.

ISO -- advisory loss costs
RMS/ Eqecat/AIR -- advisory cat costs

ISO and the cat modelers perform the same functions, yet one is regulated as advisory organization and the others are black boxes unexamined by most regulators. It is simply bizarre that such black box output would be permitted by regulators.

And AIR is a subsidiary of ISO. How is it that ISO is a licensed advisory organization, but its wholly owned subsidiary performing identical activities as ISO is not regulated by the states?

Reliability of Models – Implications for How Models are Used

Eqecat says that the cat models promote business stability by reducing the uncertainty in prospective finance of natural cat risk. That's what we were promised in 1992 after Hurricane Andrew – but that has hardly been the experience and results of cat models in recent years with massive changes to cat models and cat model results after each major event.

What are models? They are computer models with what Eqecat calls “lots of degrees of freedom.” This means that the point estimate of losses is associated with a wide range of likely outcomes.

At the 2006 Reinsurance Association of America Cat Modeling Conference, Frederico W Wiseman presented the latest in a series of comparisons of the major catastrophe models – comparing outputs from the models based on the same inputs into the models. He not only found wide variation among the modelers' output, but a wide range of likely outcomes for individual models. In some cases the point estimate of expected losses from one model was twice that of another model. The coefficient of variation among the models' outputs – the standard deviation of results divided by mean – ranged from 2 to 17.

The disparity among the models and the large range of likely outcomes should have implications for how the models are used. It is clear – not only from Mr. Wiseman’s presentation, but also from the almost annual revisions of the models that dramatically increase expected losses, that the models do not come close to representing scientific certainty about expected losses.

For example, given widely divergent outputs from three models, how and why would an insurer choose one over another? I posed that question at the RAA conference last year and was first told that users take an average of the three models. But why would it be reasonable to take an average of three models when at least two of them are significantly wrong?

I was also told that insurers should use the model with highest expected losses for justifying rates and the model with lowest expected losses for justifying capital needs to rating agencies.

Clearly, there is a need for regulators to review how insurers are using the models in addition to providing oversight of the modelers themselves.

Model Outputs are a Function of Key Assumptions

Even assuming that all the science is sound – an assumption that does not hold in the real world as evidenced by the scientists denouncing the RMS near term model methodology – there are key assumptions that dramatically affect the magnitude of expected losses. Many of these assumptions are not scientific assumptions, but public policy assumptions. But instead of these assumptions being identified for and discussed by policymakers, the cat modelers decide the value of these key assumptions based on feedback from the insurer clients.

For example, in response to the question why it chose a five-year horizon for its near term model, RMS said that was the time horizon insurers told them they used. While five years may make sense for insurers, it makes no sense for homeowners who have a much longer time horizon for their biggest asset – their home – and who typically have mortgages much longer than five years.

Other assumptions included storm surge, demand surge, fire following and return period. Again, these are as much public policy issues as insurer business decisions. Should a modeler assume massive increases in construction prices following a catastrophic event – demand surge – and increase expected losses accordingly? Or is this an issue that governments can address with anti-price gouging laws and stockpiling of key supplies?

Should the models be based on a return period of 50 years, 100 years, 250 years or more? Is it reasonable for an insurer’s rates to be sufficient to cover the highest possible, 1 in 250 year event? Or is a better public policy to require rates to cover the 1 in 50 year event?

The Near Term Model

There has been much criticism of the RMS near term model. The model basically takes their standard model and does a back-end adjustment to increase expected losses by 40% in coastal states. The back-end adjustment is a result of “expert elicitation,” which means that RMS asked a number of scientists whether they thought the next ten years would be above the historical average in terms of hurricane frequency or severity.

Of course, this approach is not objective – at best it reflects the subjective views of some scientists and, as noted in our letters, has been highly criticized by scientists, some of whom were part of the panel.

The other obvious problems include:

- Why is it that we are always in an above-average cycle producing an increase in rates?
- Would there have been a near term model if the next ten years were seen as below the long-term average?
- Given a choice, why wouldn't insurers use the near term model when it produces higher rates than the long term model, but use the long term model when it produces higher rates than the near term model?
- If the purpose of the models is long term stability – as claimed by Eqecat and as promised by insurers after Hurricane Andrew – the near term modeling completely undermines that goal. According to RMS, the current near term adjustment is a 40% increase. What happens when we get to the below average near term period when expected losses are, say 30% below the long-term average? Instead of stability, we get massive fluctuations from 140% of the long run average to 70% -- a 50% decrease or a 100% increase. Hardly the best advertisement for stable rates.
- How can the results of a complex computer catastrophe model be taken seriously when the modelers simply add 40% to output as a back-end adjustment?
- If climate change and global warming is the justification for the near term models, then what climate change forecasts are being used and what assumptions about loss mitigation and greenhouse gas emission reductions are included?

Eqecat argues that they want to submit two models – standard and near term – with significantly different expected losses with the argument that both models provide insights into pricing. How? By letting insurers choose which one serves their ability to get a rate filing approved? Eqecat's argument makes clear several important points – the models' output is predicated on major assumptions that are more public policy than science, that the models' output varies and is not a precise measurement and that the modelers' customers are insurers and the modelers' products respond to insurers' needs, which may or may not coincide with the broader public policy goals of insurance.

The fact is that the modelers compete with one another for insurers' business. But even if we assume the best – that end users sole interest is simply finding the most accurate model – then how do insurers choose? And how does this fit in with the fact that reinsurers in Florida are pricing based on what the market will bear instead of prices based on reasonable expected costs.

Recommendations

1. ***Investigate practices of risk modelers in terms of potential anti competitive and antitrust activities.*** Our letters set out these issues in detail.
2. ***Regulate risk modelers as advisory organizations.*** Let us suppose that Nebraska had a massive hail storm one year and a ferocious heat wave the next year. Nebraska insurers then start filing rates with 100% increases and point to changes in computer cat models. The insurers can't explain the change and the cat modelers simply say they have incorporated the latest science and climate change. And then the next year, the models change and rates double again based on new versions of cat models. What would Nebraska do? Assume that insurers and modelers are doing the right thing and that consumers just need to adapt? Not likely. Clearly it is better to have a regulatory infrastructure in place before this happens, not after the fact.
3. ***Update and strengthen the model law provisions regarding advisory organization oversight and regulation to cover all advisory activities.*** The provisions in the current NAIC property casualty rating model laws as well as the proposed rate and forms model law from 2000 that is recommended in the draft Personal Lines Regulatory Framework report – are woefully outdated. These advisory organization provisions are not used to cover many activities of advisory organizations like ISO – such as computer claim settlement models – let alone the activities of cat models. We ask that the Committee consider the possibility of national advisory organizations where part of the oversight can be done by a consortium of states as opposed to individual states performing identical functions of identical issues. Individual state oversight would focus on state-specific issues.
4. ***Create a public computer catastrophe model for consistency for regulators to use for solvency and rate oversight and which identifies and incorporates key public policy assumptions.*** The Florida commission panel of experts reflects the diversity of interests necessary to inform public policy.

5. ***Identify and provide guidance on key assumptions that are more public policy than science.*** Modelers readily admit the models' outputs are estimates within a broad range of reasonableness. Models should be tools not dictators. Regulatory / public policy input on key assumptions is also a way for legislators and regulators to take back some of the power from rating organizations.

6. ***Build on the work of catastrophe modeling as part of a broader framework for loss prevention and loss mitigation and disaster response.*** As we have said many times in the past, the only long term solution to insurance availability and affordability in the face of existing and emerging catastrophic exposure is loss mitigation – reducing the loss of life and property from an event – and loss prevention – reducing the likelihood of a catastrophe event. The most important function of catastrophe modelers should be to inform loss mitigation and loss prevention efforts instead of simply providing insurers with a rationale for financial risk management and the transfer of risk onto consumers and taxpayers.