Is this (our) risk? The science and politics of catastrophe insurance

Jessica Weinkle
October 27, 2014
What would you say you do here?
I study processes of deciding what you pay whatever you do for insurance and why that changes sometimes.

I do this mainly in regards to insurance for catastrophes- like hurricanes and floods.
You mean how they lie?

You mean how they denied my claim?

You mean how I can’t afford coverage?

You mean how disasters are getting worse?

You mean how our nation has too much debt?
What people think happens (part 1)
What people think happens (part 2)
What really happens
Worst Case Scenario
Public Insurance Programs

- “affordable property insurance”
  - Florida’s Citizens Property Insurance Corporation
  - FL STAT 627.351

- “distributing burdens equitably among those who will be protected by flood insurance and the general public”
  - National Flood Insurance Program
  - 42 U.S. Code § 4001
This risk is 'artificially constrained.'

That rate is not 'actuarially sound.'

Rates must reflect the 'true risk.'
Three separate but interrelated processes

- Constructing
- Characterizing
- Governing
Constructing
Characterizing Barbie

Barbie

Average Barbie

Average Barbie
Constructing

American Girl Just Like You Doll
Decisions make risk ‘real’ in so much that you then have to pay for it.
Catastrophe Model

Geophysical
Economic
Vulnerability

50,000 or more hypothetical storm events

Probabilistic estimates of loss events
100 PML and Uncertainty Intervals

Billions of Dollars

2008 2009 2011
FCHLPM Standards Year
Kinda true, I guess... I feel like, maybe?

“a ‘stylized’ view of the facts”

- Kaldor (1961)
Is model output subject to evaluation on time scales of decision making?

- **No**
  - Not a prediction
  - Represents an average value over the long run
  - Cannot provide the right answer

- **Yes**
  - Estimate of future events
  - Used in day-to-day decision making
  - Powerful
They matter in the short run

- 2006 RMS
  - “a new understanding of hurricane risk”
    - Muir-Woods 2006
  - 30% increase in landfall activity

- $82 billion increased demand on premiums over 5 years
The relationship between science and insurance
Societal Benefit?

- Most recent economic crisis
- Solvency II
- The hurricanes that haven’t
Why bother?
## A moving target

### % difference between catalog options

<table>
<thead>
<tr>
<th></th>
<th>V 2010</th>
<th>V 2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>All US</td>
<td>19%</td>
<td>21%</td>
</tr>
<tr>
<td>FL Gulf Coast</td>
<td>8%</td>
<td>24%</td>
</tr>
</tbody>
</table>

### % change between years

<table>
<thead>
<tr>
<th></th>
<th>Cat 1-2</th>
<th>Cat 3-5</th>
</tr>
</thead>
<tbody>
<tr>
<td>US</td>
<td>-15%</td>
<td>-10%</td>
</tr>
</tbody>
</table>

Lloyd’s Market Association 2012

Willis Re 2013