Resilience in Florida

Parametric Insurance as a Solution to Protection Gaps in Insurance Coverage

Instructor: Alok Jha
Instructor ID: 1339258

(ID provided by Florida Department of Financial Services)
Course Notes, Adapted from a recent CE Class taught by Alok

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Instructors

Disclaimer: Course material presented here and views expressed in this class is on an individual basis of the instructors, and does not express views of employers or the FAIA.

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Co-Founder & CEO, Assured Risk Cover
PhD, Stanford University

Kevin McCarty
Guest Lecturer
Former Insurance Commissioner, Florida
Protection Gap

What is it?
Why do we have it?
What can we do about it?
Watch the gap…or, plug the gap
What isn’t covered?

Answer on next slide
What isn’t covered?

- Losses below windstorm deductible
- Losses above limit
- Swimming Pool Cage
- Food spoilage
- Fine art
- Jewelry
- Expensive electronics
- Mold from water damage
- Landscaping
- Tree falling outside home
- Boat docks
- Sea walls

*Water damage covered only with severe restriction

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Gap Manifestation in Florida

**Hurricane Matthew**

- 2016 “flyby” hurricane
- 44,000 claims closed, not paid
- 11,000 claims open

**Note:** actual reason for gap not investigated on a policy by policy basis

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**Hurricane Matthew Claims Data**

This information is compiled from claims data filed by each insurer. It has not been audited or independently verified. This report covers all claims based on filings received as of Friday afternoon, March 3, 2017. A downloadable Excel file appears above. This data is final; no further requests for data have been issued.

<table>
<thead>
<tr>
<th>Lines of Business</th>
<th>Number of Claims</th>
<th>Closed Claims (paid)</th>
<th>Closed Claims (not paid)</th>
<th>Number Claims Open</th>
<th>Percent Claims Closed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homes/Exam</td>
<td>92,957</td>
<td>42,628</td>
<td>20,322</td>
<td>2,797</td>
<td>92.6%</td>
</tr>
<tr>
<td>Dwelling</td>
<td>11,383</td>
<td>6,719</td>
<td>3,537</td>
<td>807</td>
<td>92.9%</td>
</tr>
<tr>
<td>Mobile Homeowners</td>
<td>6,599</td>
<td>4,917</td>
<td>1,461</td>
<td>221</td>
<td>96.7%</td>
</tr>
<tr>
<td>Commercial Residential</td>
<td>513</td>
<td>102</td>
<td>193</td>
<td>216</td>
<td>57.7%</td>
</tr>
<tr>
<td>Residential Property</td>
<td>101,454</td>
<td>55,576</td>
<td>38,835</td>
<td>7,043</td>
<td>93.1%</td>
</tr>
<tr>
<td>Commercial Property</td>
<td>6,090</td>
<td>1,295</td>
<td>2,480</td>
<td>2,223</td>
<td>56.4%</td>
</tr>
<tr>
<td>Private Flood</td>
<td>145</td>
<td>94</td>
<td>41</td>
<td>10</td>
<td>90.1%</td>
</tr>
<tr>
<td>Federal Flood</td>
<td>2,288</td>
<td>2,158</td>
<td>945</td>
<td>263</td>
<td>91.9%</td>
</tr>
<tr>
<td>Flooding</td>
<td>3,450</td>
<td>2,252</td>
<td>996</td>
<td>274</td>
<td>92.0%</td>
</tr>
<tr>
<td>Business Interruption</td>
<td>229</td>
<td>60</td>
<td>103</td>
<td>66</td>
<td>71.2%</td>
</tr>
<tr>
<td>Other Lines of Business</td>
<td>7,601</td>
<td>4,604</td>
<td>1,064</td>
<td>1,003</td>
<td>86.3%</td>
</tr>
<tr>
<td><strong>TOTALS</strong></td>
<td><strong>119,343</strong></td>
<td><strong>63,817</strong></td>
<td><strong>44,188</strong></td>
<td><strong>11,340</strong></td>
<td><strong>90.3%</strong></td>
</tr>
</tbody>
</table>

Source: Florida OIR
Gap Manifestation in Florida

**Hurricane Irma**

- 2017 land fall hurricane
- 297,000 claims closed, not paid
- 106,000 claims open

**Note:** actual reason for gap not investigated on a policy by policy basis

**Recall:** About 60% of 2017 Catastrophe losses not insured, at macro level

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**Hurricane Irma Claims Data**

This aggregate information is compiled from claims data filed by insurers. It has not been audited or independently verified and covers all claims based on filings received by the Florida Office of Insurance Regulation as of April 6, 2018 at 3:10 pm. The next update to this information will be collected on June 8, 2018 and published on June, 11, 2018.

<table>
<thead>
<tr>
<th>Lines of Business</th>
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<th>Closed Claims (not paid)</th>
<th>Number Claims Open</th>
<th>Percent Claims Closed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential Property</td>
<td>770,658</td>
<td>440,750</td>
<td>253,938</td>
<td>75,970</td>
<td>90.1%</td>
</tr>
<tr>
<td>Homeowners</td>
<td>610,186</td>
<td>338,570</td>
<td>208,981</td>
<td>62,615</td>
<td>89.7%</td>
</tr>
<tr>
<td>Dwelling</td>
<td>97,786</td>
<td>57,774</td>
<td>30,825</td>
<td>9,187</td>
<td>90.6%</td>
</tr>
<tr>
<td>Mobile Homeowners</td>
<td>53,805</td>
<td>41,790</td>
<td>10,356</td>
<td>1,657</td>
<td>95.9%</td>
</tr>
<tr>
<td>Commercial Residential</td>
<td>8,901</td>
<td>2,616</td>
<td>2,774</td>
<td>2,511</td>
<td>71.8%</td>
</tr>
<tr>
<td>Commercial Property</td>
<td>58,237</td>
<td>14,095</td>
<td>19,798</td>
<td>24,344</td>
<td>58.2%</td>
</tr>
<tr>
<td>Private Flood</td>
<td>1,778</td>
<td>910</td>
<td>580</td>
<td>288</td>
<td>83.8%</td>
</tr>
<tr>
<td>Business Interruption</td>
<td>3,800</td>
<td>1,577</td>
<td>1,045</td>
<td>044</td>
<td>83.3%</td>
</tr>
<tr>
<td>Other Lines of Business</td>
<td>89,900</td>
<td>64,465</td>
<td>20,762</td>
<td>4,672</td>
<td>94.8%</td>
</tr>
<tr>
<td><strong>TOTALS</strong></td>
<td>924,430</td>
<td>521,797</td>
<td>206,724</td>
<td>105,918</td>
<td>88.5%</td>
</tr>
</tbody>
</table>

Source: Florida OIR
What do you mean by Protection Gaps in Homeowners Insurance?

Protection gap is the difference between insured losses and economic losses, or uninsured losses.

Source: Aon Benfield Analytics
Protection Gap (in $) = non-resilience

Source: Swiss Re Institute

Natural catastrophe losses: Insured vs uninsured losses, 1970-2017
Causes of Protection Gap in Florida Homeowners Hurricane Property Losses

- **Hurricane Deductibles**
  - Over 85% of Floridians have 2% wind deductibles or greater
  - 55% of Floridians have difficulty paying their deductible

- **Coverage exclusions**
  - Pool cages
  - Trees not damaging a structure
  - Boat Docks
  - Generators
  - Voluntary evacuation expenses
  - Landscaping

- **Sub-limits on losses**
- **Inadequate limits**
- Many Floridians have excluded wind from coverage
Causes of Protection Gap (cont.)

- Coverage bought may not be enough. Actual replacement value of property not known, until actual rebuilding happens.
- Market value is NOT equal to replacement value
- Sub peril may not be covered. But, but that water was from Irma…Sorry, you need to claim water damage under your flood policy
- That fine jewelry, painting, or 4K Curved OLED TV that you have…is typically excluded or sub-limited
- If you don’t repair and mold sets in, that may not be covered
  - Cat claims take days, weeks, months, years to settle….25% of claims declined
- High repair labor cost post-hurricane, may also result in protection gap
The Risk Pie… Share the Risk… Have a Gap

Loss
$0

Share of Risk
0%
100%

Above Limit
Risk ceded to Insurer

Below Deductible

Exclusions in Policy

Risk retained by Insured (Policyholder)

The loss probability,
A very non-bell curve

$Value
Need a Parametric Insurance to plug gap…

What is Parametric Insurance?
Is it new? What all does it cover? Why do we need it?
**Definition of Parametric Insurance:**

**Wikipedia** - Parametric insurance is a type of insurance that does not indemnify the pure loss, but ex ante agrees to make a payment upon the occurrence of a triggering event. The triggering event is often a catastrophic natural event which may ordinarily precipitate a loss or a series of losses....

Note a “pure parametric product” may not be deemed insurance, so there has to be an associated loss claim to deem it as insurance.
What is Insurance with a Parametric Loss Trigger

- Loss is paid based on pre-specified set of conditions
  - Specified peril (hurricane, tornado, earthquake, etc.)
  - Specified size of the event (Cat 1, Cat 2, etc.)
  - Proximity of the insured to the event

- No consideration for the physical attributes of the insured property

- Claims paid without the need of an insurance claims adjustor

- This type of insurance reduces the bureaucracy when it is time to pay, but there is a caveat. It doesn’t cover the whole loss or damage it just pays out a predefined sum.

Recall **Traditional insurance** also doesn’t cover the whole loss, it just pays out based on policy wording
Parametric Insurance... Is it new?

• Life insurance is parametric
• Aflac has been providing parametric insurance for sickness and injury to millions of people
• Adjacent market: Catastrophe bonds of parametric nature have been traded for couple of decades now
• Drought insurance, crops, agriculture insurance on parametric basis offered by World Bank and private insurers
• State of Alabama has parametric hurricane insurance
• Caribbean government has parametric insurance for hurricanes and earthquakes
• Parametric insurance also exists for: Extreme rain, temperature fluctuations
• Pandemic parametric insurance also provided at regional level

….so it is not new, after all!
Examples of Triggers for Parametric Insurance Products

- Hurricane
  - Localized wind speed calculation
  - Wind speed footprint
  - Size of the event and distance from the track

- Earthquake
  - Localized seismic measurement
  - Shake intensities by region
  - Size of event and epicenter distance from insured
Compare Parametric to Indemnity product

How does it differ? What are benefits of each? Who all does it benefit?
How Does a Parametric Triggered Loss Compare to an Indemnity Payment?

• Parametric
  • Payment driven by payout formula
  • No claims adjustor
  • Claims payment can be made quickly

• Indemnity
  • Claim based on coverage language in the policy contract
  • Loss assessed by claims adjustor
  • Payment based on actual loss
  • Payment generally slow after significant catastrophe
Traditional/Indemnity VS Parametric/Index

<table>
<thead>
<tr>
<th></th>
<th>Traditional Insurance</th>
<th>Parametric/ Index based Cover</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trigger</td>
<td>Loss or damage to physical asset</td>
<td>Event occurrence exceeding pre-defined threshold or trigger</td>
</tr>
<tr>
<td>Recovery</td>
<td>Reimbursement of actual loss sustained</td>
<td>Pre-agreed payment structure based on event parameter or index value</td>
</tr>
<tr>
<td>Basis Risk*</td>
<td>Policy conditions, deductibles and exclusions</td>
<td>Correlation of chosen index and structure with actual exposure</td>
</tr>
<tr>
<td>Loss assessment and Payment</td>
<td>Months to several years – depending on complexity of loss</td>
<td>Very transparent and settlement within 30 days</td>
</tr>
<tr>
<td>Term</td>
<td>Usually annual, multi-year difficult</td>
<td>Single or multi-year (up to 3 years)</td>
</tr>
<tr>
<td>Structure</td>
<td>Standard products and contract wordings</td>
<td>Customized product with high structuring flexibility (single trigger, multi-trigger)</td>
</tr>
<tr>
<td>Form</td>
<td>Insurance Contract</td>
<td>Insurance Contract</td>
</tr>
</tbody>
</table>

*Risk that Client’s collected payout is not equal to your actual loss.

Source: Swiss Re
Okay, fine. Tell me the benefits of Parametric Insurance

Where is it helpful? Who does it help?
Parametric Products Pay Quickly

- Definitively defined payment
- No claims adjustor necessary
- Payment arrives quickly when insured needs it the most
  - Evacuation expenses
  - Pay unanticipated expenses
  - Hire immediate services
  - Pay expenses under the hurricane deductible
- Rapid payment reduces loss amplification
- Efficient payment distribution, reduces loss adjustment expenses…more efficient price for insured
- Esp. helpful in catastrophes, where industry and government resources get maxed out
Parametric Insurance – a tool for Florida

Kevin McCarty
Guest Lecturer
Former Insurance Commissioner
Parametric Insurance – a neat tool

Without Parametric

• Brunt of economic loss borne by individuals, corporations, and governments

• Primary govt. effects: emergency relief expenses, loss of capital and durable goods

• Secondary govt. effects: lower economic growth, lower/no tax revenue, budget deficits

With Parametric

• Smaller gap between economic and insured loss

• Reduced financial burden for govt. & society

• Loss volatility for state budget

Source: Swiss Re
How do you build a Parametric Product?

Science and experience. Pricing a policy. Paying a claim
Deconstructing a Parametric Insurance Product

Typical model used to quantify risk and calculate the basis for price for a typical indemnity homeowners policy

- **Hazard model** – what is the peril and size and probability of occurrence
- **Vulnerability model** – given and specific event what is the damage to the home
- **Financial model** – Given damage to the home how does the insurance policy respond from a financial perspective

Parametric products do not require a vulnerability assessment of a home and the financial model is very simple
How do you get the price? A Case Study for Parametric Insurance for Hurricanes

- Robust hi-res pricing algorithms at the individual property level
- Stochastic models to simulate physically-behaved hurricanes
- Captures spatial temporal correlation of hurricane-defining parameters
  - Latitude & Longitude of hurricane eye
  - Forward velocity
  - Central pressure deficit
  - Maximum wind speed
  - Radius to maximum wind speed
- Informed by meteorological data such as sea surface temperature
- Machine learning capability to update pricing in real time
How to Get the Price
How to Get the Price

Grid the basin
Learn the hurricane physics
Use predictive data (e.g. Sea Surface Temp)
Validate model, simulate hurricanes to price

Pricing a policy

- Now have trained model
- Couple with predictive parameters (e.g. SST)
- Use best estimate of hurricane frequency
- Simulate tens of thousands of hurricanes with associated occurrence probabilities
- Use this robust set to price one policy
Is StormPeace expensive?

• Total cost to consumer, without StormPeace, and only with HO windstorm
  
  • HO Premium + Cost of all excluded losses
  
  • Say, $3,000 (Premium) + $10,000 (Uncovered Loss) + $2,000 (mold) = $15,000 for the year in which Cat 2-3 hurricane occurs

• Total cost to consumer, with StormPeace, and with HO windstorm

  • HO Premium + StormPeace Premium + Cost of any remaining losses
  
  • Say, $3,000 (HO Premium) + $700 (StormPeace Premium) + $500 = $4,200 for the year in which Cat 2-3 hurricane occurs

• This is a huge savings for the consumer, plus owing to rapid StormPeace payment any amplification of losses (e.g., mold) gets minimized.
Okay, you priced the policy. How do you pay the claim?

• Use neutral, credible 3rd party data to determine claims amount
• Use US National Hurricane Center public advisory parameters
• With these parameters, look up pre-determined claims amount
• Notify policy holder, they attest to loss amount
• Send the payment
• Upload proof-of-loss
How do Insured Losses Get Paid When They Have a Parametric and an Indemnity Product?

• Applicable to insureds with a homeowners policy and a parametric product
• Loss payments are independent from each product
• Indemnity paid based on actual loss with deductible, limit and exclusions
• Parametric paid based on formula without financial deductions
• Gaps in coverage minimized…resilience maximized
Why is a Parametric Product good for the Consumer?

- Helps cover expenses not covered by indemnity products
- No potential disputes with the claims adjustor
- Payment can be made to the insured quickly without access to the property
- Quick payment can assist the homeowner in taking action to prevent additional losses
Why is a Parametric Product good for Society?

• People get money faster, so recovery begins faster
• Less burden of disaster relief
• Faster recovery implies economy revs up faster and tax revenue comes back to normalcy faster
• More planning certainty
• Less volatile state budget implications
Summary

What have you learned?
Key Learnings

- Society needs Parametric Insurance products
- Parametric for catastrophes (e.g., hurricanes) provides for rapid financial relief
- Science & technology provides for efficient model, to disburse claims payments, esp. in catastrophes where industry & government resources get stretched to (beyond) max
- Offers benefits to policy holder, agent, insurance carrier, government
- Plugs gaps in indemnity products
- Offers the opportunity for a more resilient society, a more resilient Florida!
Thank You!

Need to follow up?
Email: team@stormpeace.com
Visit: www.StormPeace.com