

Reinsurer Property Catastrophe Loss Estimation

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Reinsurer Property Catastrophe Loss Estimation

Reinsurer exposure to property cat losses

- **Excess of Loss**
 - Occurrence or aggregate protection
 - Limit of coverage excess of attachment point ranging from less than \$1 million to \$ billions

- **Quota Share**
 - Cat exposure usually capped by excess of loss coverage (separately reinsured)

- **Industry Loss Warranty**
 - Limit payable if the industry loss for an event exceeds a specified amount in \$ billions

Reinsurer Property Catastrophe Loss Estimation

Underwriting cat reinsurance

- Underwriting process provides probable maximum loss (PML) estimates by region and peril
 - Determine loss capacity by region/peril based on management's risk appetite reflecting risk/reward potential of markets
 - Underwriting opportunities prioritized to best utilize cat capacity
 - Cat capacity not always fully utilized
 - Gain/loss potential determined using cat modeling firm software and actual experience (where meaningful)
 - AIR
 - RMS
 - EQECAT

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Underwriting cat reinsurance

- Underwriting process provides probable maximum loss (PML) estimates by region and peril

**Business Inforce
Catastrophe Loss Exposure ***
(Figures in \$millions)

| Peril | 1 in 10 years | 1 in 25 years | 1 in 50 years | 1 in 100 years | 1 in 250 years |
|-------------------|------------------|------------------|------------------|-------------------|-------------------|
| Wind | | | | | |
| U.S. South | 150 | 300 | 525 | 750 | 1,000 |
| U.S. East | 125 | 250 | 500 | 700 | 900 |
| Europe | 100 | 225 | 400 | 600 | 750 |
| Japan | 90 | 200 | 300 | 450 | 600 |
| • | • | • | • | • | • |
| • | • | • | • | • | • |
| • | • | • | • | • | • |
| Earthquake | | | | | |
| U.S. | 2.5 | 50 | 200 | 450 | 750 |
| Japan | 2.5 | 50 | 200 | 450 | 750 |
| Canada | 1.0 | 30 | 150 | 300 | 500 |
| • | • | • | • | • | • |
| • | • | • | • | • | • |
| • | • | • | • | • | • |

*Figures are not representative of actual exposure

Reinsurer Property Catastrophe Loss Estimation

Cat loss estimation prior to occurrence of event

- For events expected to generate claims activity less than a selected loss threshold (attritional losses)
 - Would generally include most tornados, wildfires, hail, and winter storm events
 - Loss provision based on long-term average loss for aggregated events

- For events expected to generate significant claims activity
 - PMLs for region/peril involved
 - Loss scenarios by cat modeling firm software, based on anticipated event
 - Broad range of estimates

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Cat loss estimation after event occurs

➤ Initial Estimate

- Based on cat modeled scenario most consistent with event reflecting inforce contracts
 - Not reliable indicator in many instances

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Cat loss estimation after event occurs

➤ Refined Estimates

- Compile loss estimate for inforce contracts expected to be exposed to event
 - Estimates based on:
 - Insurer information (most reliable source of info, but not available until weeks or months after event occurrence)
 - Cat modeling estimates by inforce contract
 - Cat modeling estimate for overall industry insured loss
 - Judgment

➤ As loss matures, insurer information substitutes for modeled estimates and judgment

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Event loss estimates by inforce contract

Inforce contracts impacted by loss (all numbers in USD)

| Cedent/Treaty Description | A Occurrence Limit | B Retention | C Reinsurer Share | D = A x C Reinsurer Limit | E Contract Premium | F = C x E Reinsurer Premium | Estimate as of XXXX | | | |
|-----------------------------------|-----------------------|----------------|----------------------|------------------------------|-----------------------|--------------------------------|-------------------------|--|--|---|
| | | | | | | | G Ground Up Estimate | H = C x (G-B)* Reinsurer Indicated Loss | I = (H / D) x F Reinsurer Indicated Reinstatement | J = H - I Reinsurer Loss Net of Reintatement |
| Catastrophe Excess of Loss | | | | | | | | | | |
| Cedant 1 | 50,000,000 | 200,000,000 | 2.00% | 1,000,000 | 4,324,812 | 86,496 | 100,000,000 | - | - | - |
| Cedant 2 | 600,000,000 | 500,000,000 | 2.00% | 12,000,000 | 90,000,000 | 1,800,000 | 400,000,000 | - | - | - |
| Cedant 3 | 70,000,000 | 90,000,000 | 2.00% | 1,400,000 | 3,081,000 | 61,620 | 25,000,000 | - | - | - |
| Cedant 4, Contract 1 | 400,000,000 | 100,000,000 | 0.70% | 2,800,000 | 80,000,000 | 560,000 | 600,000,000 | 2,800,000 | 560,000 | 2,240,000 |
| Cedant 4, Contract 2 | 300,000,000 | 500,000,000 | 0.85% | 2,550,000 | 30,000,000 | 255,000 | 600,000,000 | 850,000 | 84,915 | 765,085 |
| Cedant 4, Contract 3 etc. | 200,000,000 | 800,000,000 | 1.75% | 3,500,000 | 20,000,000 | 350,000 | 600,000,000 | - | - | - |
| Totals | XXXX | | | XXXX | XXXX | XXXX | XXXX | XXXX | XXXX | XXXX |
| Per Risk Excess of Loss | | | | | | | | | | |
| Cedant 1 | 30,000,000 | 10,000,000 | 2.5% | 750,000 | 2,605,000 | 65,125 | - | - | - | - |
| Cedant 2 | 15,000,000 | 10,000,000 | 12.5% | 1,875,000 | 3,982,500 | 497,813 | - | - | - | - |
| Cedant 3 etc. | 20,000,000 | 5,000,000 | 12.0% | 2,400,000 | 8,000,000 | 960,000 | 17,000,000 | 1,440,000 | - | 1,440,000 |
| Totals | XXXX | | | XXXX | XXXX | XXXX | XXXX | XXXX | XXXX | XXXX |
| Pro-Rata | | | | | | | | | | |
| Cedant 1 | 410,000,000 | | 1.00% | 4,100,000 | 238,000,000 | 2,380,000 | 80,000,000 | 800,000 | - | 800,000 |
| Cedant 2 | 85,000,000 | | 2.50% | 2,125,000 | 42,500,000 | 1,062,500 | 4,000,000 | 100,000 | - | 100,000 |
| Cedant 3 etc. | 136,000,000 | | 10.00% | 13,600,000 | 150,000,000 | 15,000,000 | 136,000,000 | 13,600,000 | - | 13,600,000 |
| Totals | XXXX | | | XXXX | XXXX | XXXX | XXXX | XXXX | XXXX | XXXX |

* Subject to occurrence limit

Reinsurer Property Catastrophe Loss Estimation

Summary

- **Overall loss estimate**
 - **Loss estimates where available from insurers**
 - **Estimates based on cat modeled results with underwriter judgment for all other involvements**
 - **Management margin for uncertainty**
 - **Uncertainty varies by type of event/coverage/region**
 - **Earthquakes more uncertain than hurricanes**
 - **Property risk exposure more uncertain than property catastrophe and personal lines exposure**
 - **Modeling/communications better in peak zones, where 'tested' by recent storms compared to non-peak zones**