

Casualty Actuarial Society Ratemaking and Product Management Seminar
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Development of the Homeowners By-Peril Rating Plan

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Topics

1. AAIS – a brief overview
2. Some considerations on advisory organization ratemaking
3. HO by-peril rating plan summary and structure
4. Development of factors and relativities
5. Development of base loss costs
6. Development of rating manual and making filings

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AAIS – A Brief Overview

AAIS is . . .

- An advisory organization
- A statistical agent
- Licensed in all states, DC and PR

AAIS supports several major P&C product lines such as Homeowners, Inland Marine, Farmowners/Ag, BOP, Commercial Monolines as well as some specialty lines

Approximately 700 property casualty affiliates use AAIS programs for forms, manuals and loss cost information as their product base

As an advisory organization, AAIS provides advisory loss costs (loss & LAE), but not final rates. Companies use loss cost multipliers to load in expenses and profit

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Some Considerations on Advisory Organization Ratemaking

Based on industry data, thus reflects an "average" risk

Company experience may vary due to many reasons including

- Underwriting/risk selection
- Claim settlement practices
- Age of book

Companies, especially larger ones, may

- Use advisory loss costs as a resource
- Price independently
- Make independent filings selectively adopting certain features, e.g. AOI curves, endorsements

Advisory organization classification plans are typically

- Simpler
- Driven by considerations of loss experience and consistency
- Not driven by marketing/competitive considerations, unlike company's

Intended to be solid foundation for company's own rating plan

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HO By-Peril Rating Plan Summary

Approved in all states and DC, except FL, NC, HI and PR

Complete rating manual including

- Zone/subzone definitions, different from AAIS's traditional homeowners
- Base loss costs
- Factors and relativities
- Optional charges and endorsements

Independent of AAIS's traditional homeowners program

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Territory Structure

- Zones**
- Defined at county level
 - Base loss costs are provided at zone level
- Subzones**
- Defined at either ZIP Code level or town level in states disallowing zip rating
 - Further segment base loss costs within its zone
 - Intended to be "neutral" overall within its zone
- Achieves rating that is**
- Transparent, not black box – zones and subzones are explicitly defined in the manual
 - Granular and flexible allowing companies to deviate based on their own experience or competition

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Development of Factors and Relativities

- Peril specific frequency and severity models (non-catastrophe perils)**
- Developed in SAS and Pretium
 - Poisson distribution for frequency and gamma distribution for severity
 - Considered pure premium modeling with Tweedie distribution
 - Chose separate frequency and severity models for better flexibility with smoothing and selections
 - Include applicable rating variables and external variables

- Data**
- Five years of calendar/accident data
 - Approximately 50 million records summarized into 2 million records for frequency models

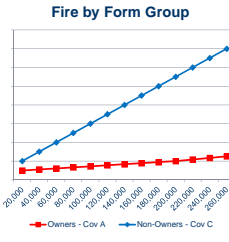
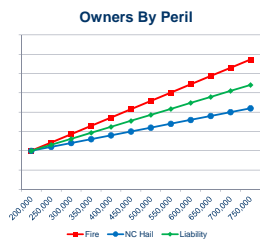
- Some key observations**
- Parameter estimates significantly vary by peril
 - Selections and smoothing are needed to ensure that final factors are
 - ✓ Reasonable
 - ✓ Reflect coverage
 - ✓ Reversal free

Catastrophe perils – calculated as ratio of modeled pure premiums, actual to base

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Selected rating variables

Amount of Insurance

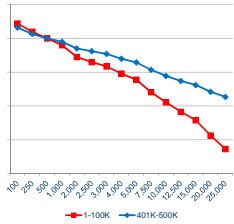


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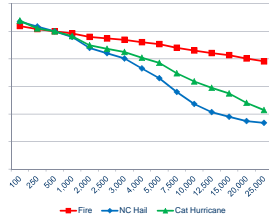
Selected rating variables

Deductibles

Owners by AOI Band



Owners By Peril



Fire Protection Class

Graphs will be shown during the presentation

AAIS's simplified fire protection class indicated relativities are flatter in By-Peril than Traditional/Composite rating plan
Increased territory segmentation partially accounts for it

GLM Parameter Estimates

As expected, predictive variables not the same for different perils

Some were combined into peril specific scores and put into score bands

Score bands assigned GLM based relativities based on countrywide models

Score bands and factors are validated on state experience, factors adjusted if necessary

Validation

Graphs will be shown during the presentation

Base Loss Costs by Zone – Non-Cat Perils

Average classification relativity (ACR) is calculated at zone, state and region levels as follows:

Rerate exposures at base level (EBL) using Cov A at 200K, 500 fire deductible, etc.

Rerate exposures at actual level (EAL)

Factor selections must be finalized now

Then $ACR = EAL / EBL$

Note that all risks are rated assumed same location (base loss costs cancel out)

Region base loss cost = Trended Ultimate Loss & LAE / (EHY * ACR)

State base loss cost – same calculation but with region as credibility complement

Zone relativity is based on zone loss experience credibility adjusted with score band relativities

Zone base loss cost is state base loss cost "spread" using zone relativities

Fire Base Loss Costs - KY

Color coded maps will be shown during the presentation

Base Loss Costs by Zone – Cat Perils

Based on catastrophe modeling software
Software produces PML and AAL, among other things
AAL – Average annual loss
Modeled at ZIP Code level, base coverage

- Rolled to Zone level
- For hurricane, ZIP Code differences in AAL reflected in subzone assignment

Hurricane Base Loss Costs - CT

Color coded maps will be shown during the presentation

Making Rating Manual

Developed by AAIS Product Development staff
Manual rules written to describe variable definitions and derivations
Synced up with AAIS forms
Includes miscellaneous loss costs

- Water back up loss costs updated
- Others are imported from AAIS's traditional homeowners program, modified if necessary

Filing Experience

Now approved in all states and DC except FL, NC, HI and PR

Many departments of insurance needed great deal of education, despite history of HO by-peril filings by insurance companies

Substantial documentation was requested on catastrophe modeling

- ASOP 38 documents were very helpful
- Additional technical notes were often required
- Conferences with departments of insurance were held

Not all states accept catastrophe modeling in pricing

- Traditional catastrophe provision could help in those states
- More work was needed in coastal states

Some departments of insurance were interested in GLM details and more documentation supporting selections differing from indications

Lessons Learned

Multistate filings of brand new rating plans require

- Flexible templates
- Effective tool for publishing loss cost information in manuals
- State checklists
- Knowledge of state differences

Questions/Discussion/Follow-up Items ...

Thank you!
