



ASSOCIATION ACTUARIELLE INTERNATIONALE
INTERNATIONAL ACTUARIAL ASSOCIATION

13th Global Conference of Actuaries 2011

Emerging Risks... Daring Solutions



Institute of Actuaries of India

Rating Commercial Property: small vs LARGE Risks

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February 20 – 22, 2011

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Commercial Property: small vs LARGE Risks

Small/Mid	Large
<ul style="list-style-type: none"> Actuarial 	<ul style="list-style-type: none"> Underwriters/Engineers
<ul style="list-style-type: none"> Many class base rates (occupancy, type of construction, fire protection, territory, etc) 	<ul style="list-style-type: none"> Fewer class base rates, adjusted for specific conditions relative to that account
<ul style="list-style-type: none"> Automated underwriting 	<ul style="list-style-type: none"> Sophisticated underwriting
<ul style="list-style-type: none"> small – exposure rated Medium – exposure rated 	<ul style="list-style-type: none"> Exposure rated, possibly experience but more for an aggregate portfolio
<ul style="list-style-type: none"> small – no specific risk management Medium – broker supported risk management 	<ul style="list-style-type: none"> Fair to sophisticated risk management
<ul style="list-style-type: none"> Predefined catastrophe loads 	<ul style="list-style-type: none"> Individual catastrophe modeling required



Data Collection – Exposure Data

- Collect data for each location
- Key data items
 - Exposures: buildings, contents, structures, outside equipment, business interruption, builders risk
- Key classification items
 - Occupancy (e.g., airport passenger terminals, dry cleaners, restaurants)
 - Construction
 - Construction may vary by peril
 - Protection (Fire)
 - Private – Automatic sprinklers or not
 - Public – Adequate fire department and adequate water supply
 - Territory
 - State, city, town, zip
 - Territories may vary by coverage (exposure), peril



Data Collection – Policy Data

Key data items

- Inception date and length of policy (if not 1 year)
- Form/coverages provided
- Insured values – building, contents, business interruption
- Limit and if a layered policy - attachment point
- Deductible
- Premium



Data Collection – Loss Data

- Paid and outstanding amounts for loss and loss expense
 - Ground-up loss if available
 - If not, need to add deductible to loss for analysis
 - Split by exposure – building, contents, business interruption
- Date of loss
- Peril/cause of loss
 - Fire, lightning, explosion, vandalism
 - Windstorm, hail, smoke, aircraft/vehicles, riot, civil commotion, sinkhole collapse, volcanic eruption
 - Theft, water
 - Earthquake
 - Flood
- Policy number – so the policy data can be attached to the loss data



Ratemaking

- Purpose is to determine a rate per exposure unit
 - Usually either per 100 or per 1000 units of exposure
 - Small commercial fire normally \$100 of insurance
- Rate begins with an actual “loss cost” or “burning cost”
 - = historical losses / historical exposure units
 - for matching time frame
 - How long will rates be in effect?
 - Loss trend
 - Exposure trend
 - Loss development, if accident year
 - Adjustments for changes in coverage and/or deductible



Ratemaking (cont'd.)

- ◎ Summarize data in homogeneous groups
 - By peril or forms
 - By occupancy (or group of occupancies)
 - By construction
 - By protection
 - By territory
 - Or any combination of the above
- ◎ Options
 - Base class w/ relativities
 - More base classes with fewer relativities



Ratemaking (cont'd.)

- When data is not adequate for a segment
 - Credibility
 - Class groups should be large enough to measure costs with sufficient accuracy
 - Trade-off between the need to estimate costs accurately for an individual and the need for enough data to do it
 - Give some credibility to pertinent data segment (e.g., occupancy = hotels)
 - For the complement use larger, less homogeneous data, but still pertinent (e.g., non-industrial risks)
 - Need for off-balance factors
 - For differences due to construction, fire protection or territory, one can use entire data to calculate relativities to apply for all occupancies



Loss Cost Rating Procedure - Small Risks

Commercial Fire Loss Cost
= Base class (form, occupancy)
x building construction factor
x protection class factor
x territorial multiplier
x co-insurance factor
x limit of insurance relativity
+ additional surcharges



Multivariate Techniques

- ◎ Univariate (One-Way) Analyses
 - Based on assumption that effects of single rating variables are independent of all other rating variables
- ◎ Multivariate Analyses
 - Give consideration to the correlation or interaction between rating variables
 - Bailey's Minimum Bias Method
 - Least Squares Method
 - Generalized Linear Model (GLM) Method



Loss Cost Rating Procedure – Another Alternative for Small Risks

Commercial Fire Loss Cost

= Base class (form, occupancy)
x building construction factor
x protection class factor
x territorial multiplier
x co-insurance factor
x limit of insurance relativity
+ additional surcharges

Commercial Fire Loss Cost

= Base class (form, occupancy, territory, construction)
x protection class factor
x co-insurance factor
x limit of insurance relativity
+ additional surcharges

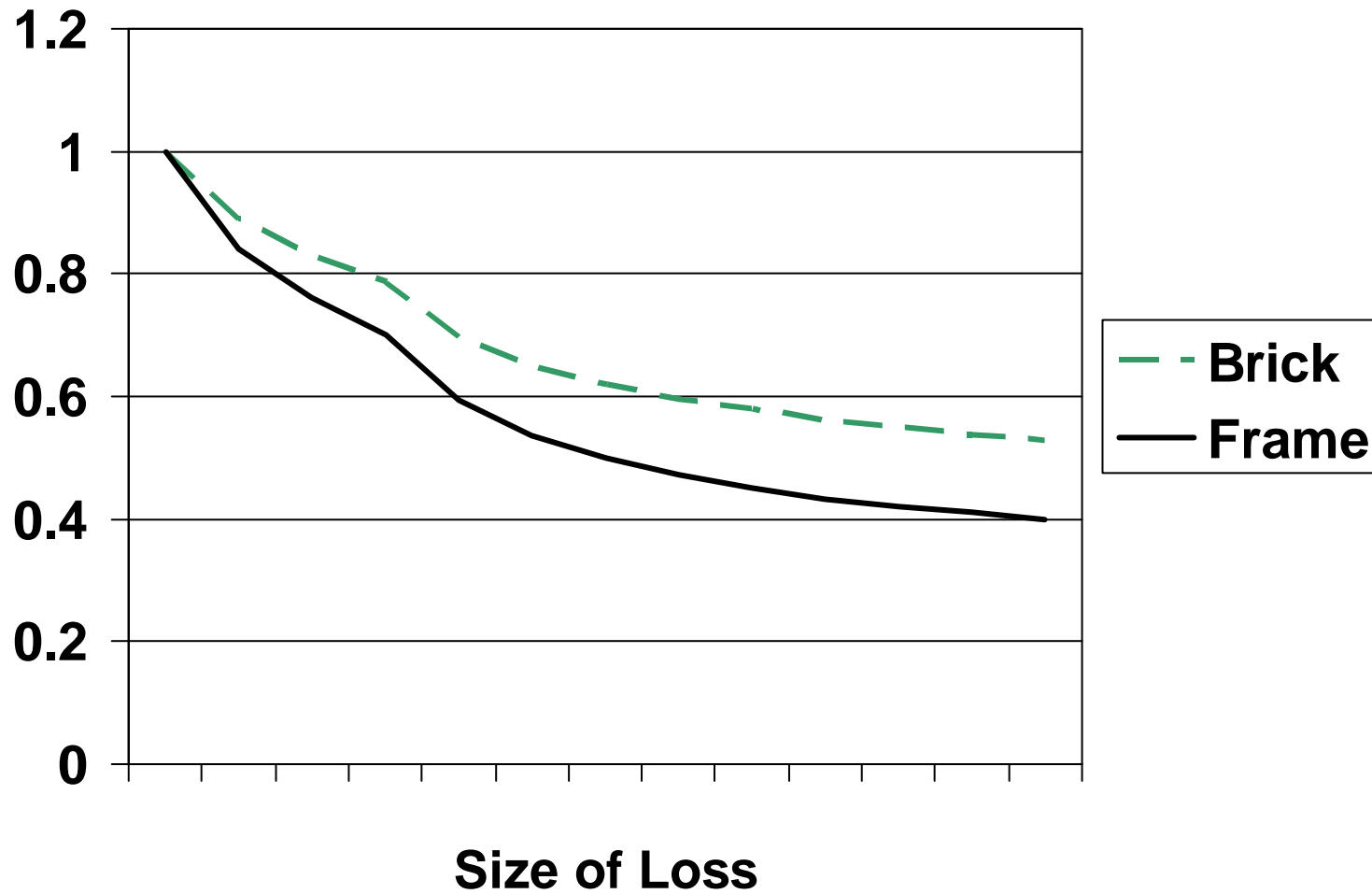


Coinsurance factor

- If insured purchases insurance for at least 80% of the insured value then policy pays full value of the claim, up to the limit
- If under-insured then policy does not pay full value of the claim
- If policy limit at 90% or 95% of property value than premium credit is given



Limit of Insurance Relativities (illustrative)



Additional Surcharges - Examples

- ◉ Personal property off premises
- ◉ Personal effects and property of others
- ◉ Fine Arts Coverage
- ◉ Computer Equipment Coverage
- ◉ Outdoor signs
- ◉ Ordinance or law impacts
- ◉ Back-up of sewers and drains
- ◉ Off-premises utility failure
- ◉ Pollutant cleanup and removal
- ◉ Recharge of fire extinguisher systems



Catastrophe Peril Consideration

- ⦿ Experience based
 - Spreads historical losses across geographic region
 - How many years? Over what area?
- ⦿ Exposure based
 - Relies upon catastrophe models
- ⦿ Rating variables could vary by peril (e.g., territory, construction)
- ⦿ Deductibles
 - For significant perils might see deductibles of 5% to 15%, with option up to 40%
 - Deductible curves might vary significantly by construction type and territory
- ⦿ Building code effectiveness



Data Collection – Exposure Data – *Wish List*

- ⦿ Age of building
- ⦿ Type of utilities/open flames
- ⦿ Size/stories/basement
- ⦿ Age/renovation of electrical wiring or plumbing
- ⦿ Sewer information
- ⦿ Change in surrounding elevation/pooling of water
- ⦿ Access to property (single, limited, multiple)
- ⦿ Terrain
- ⦿ Concentration of properties
- ⦿ Consider external databases



Large Risks – Loss Costs

- Base rates by a smaller number of categories
- Base rates are adjusted based upon “size” schedule credit
(ie: larger the account, lower the initial base rate)
- Apply debits or credits based upon the conditions that are unique to that particular risk
 - Risk Quality Adjustments
 - Scope of Coverage Adjustments
- For large risks, insurer may only cover a portion of the exposure
 - Exposure curves used to adjust for layer
- Add CAT loads (wind, flood, earth movement, etc)
- Add loads for other perils (equipment breakdown, terrorism, etc)



Large Risks – Examples of Rating Adjustments

- Risk Quality Adjustments
 - Quality of Construction Materials
 - Unique Special Hazards
 - Private Protection (Sprinklers/Alarms)
 - Public Protection (ISO Fire Grade/quality of public water)
 - External Exposures
 - Secondary Occupancies
 - Business Interruption assessment
- Scope of Coverage Adjustments
 - Type of policy form (Company form or Manuscript)
 - Is coverage Blanket or to Scheduled Limits
 - Extent of policy enhancements
 - Other unusual conditions



Large Risks – Exposure Curves

⦿ Exposure curve use

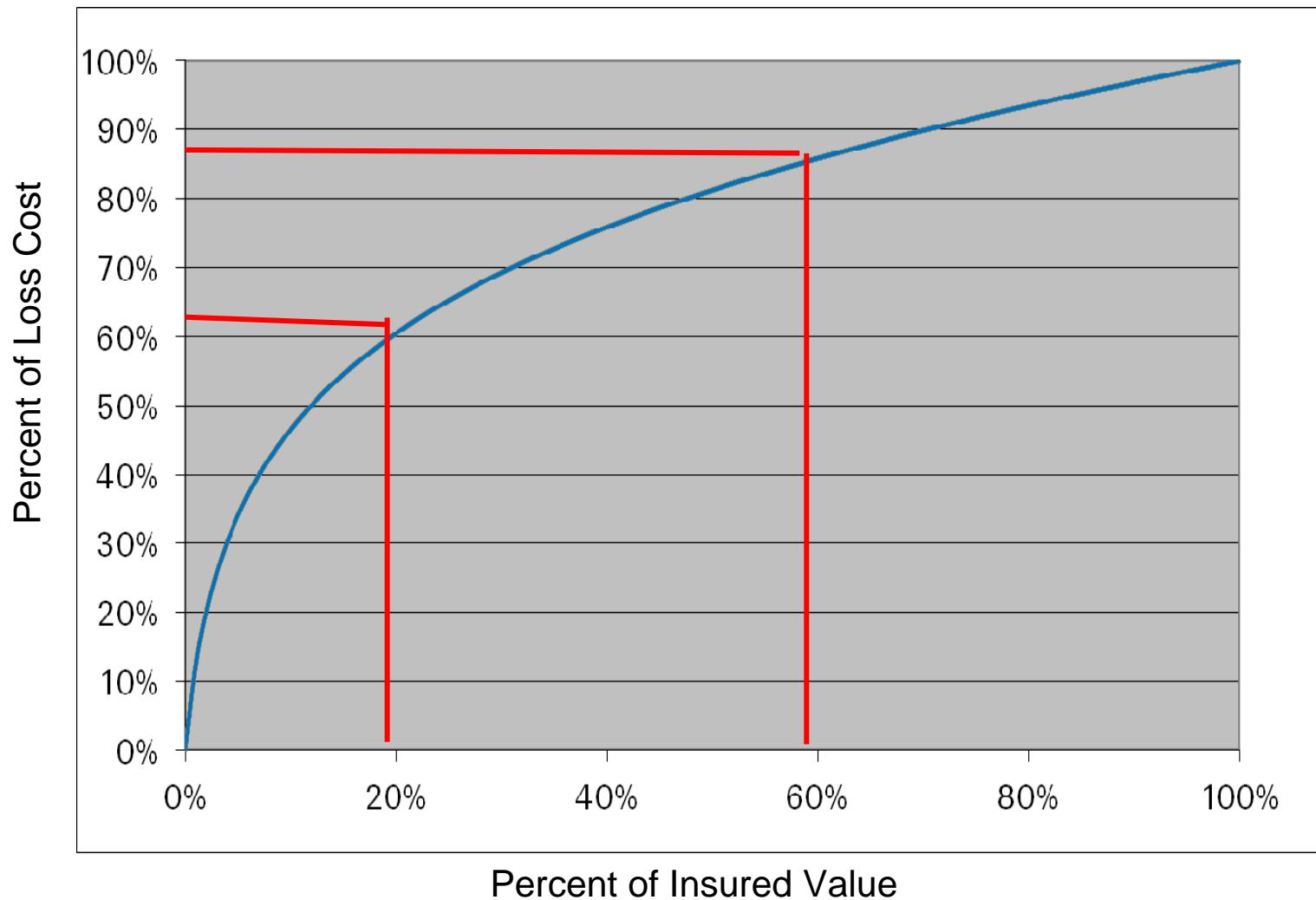
- Curves will vary by occupancy and size of risk
- In general, occupancies with less chance of large or total losses (e.g., office buildings) will have a curve that is more steep in the beginning
 - This will put more premium in lower layers of deductibles and less in higher layers
- Similarly, very large buildings will have a lower chance of total loss and should have a curve that is more steep

⦿ Sources

- Lloyds
- Reinsurer Curves (e.g., Swiss Re, Munich Re)
- ISO's PSOLD
- Combined company experience and industry curves



Large Risks – Exposure Curve Example



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Large Risks – Exposure Curve Example (cont'd.)

- See sample curve previous slide
 - X axis is the percent of insured value
 - Y axis is percent of loss cost
 - Example
 - 100 million building
 - Layer is 40 million (60%) excess of 20 million (20%)
 - The premium for the layer is the percent of loss cost between the two
 - At 20% - percent of premium = 60%
 - At 60% - percent of premium = 87%
 - Loss cost for this layer = 87% - 60% = 27% of ground-up loss cost



Some Parting Thoughts

- ⦿ Low frequency LOB's are more challenging
- ⦿ There is always a learning curve
- ⦿ There is always more data you could collect or use
 - Think external data
- ⦿ Start working on data now
- ⦿ Underwriters have valuable insight – you need to work in tandem
- ⦿ Catastrophe analysis is more important than you think



Questions?



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