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GENERAL INSURANCE PRICING SEMINAR

13 JUNE 2008, LONDON

ISO Industry Data – How it Works in the US and What Might be Done in the UK

Agenda

- About Insurance Services Office, Inc. (ISO)
- Industry Data
- Actuarial Analysis of Data

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About ISO

What Is ISO?

- Provider of data, analytics, and decision-support products
- Leading supplier of actuarial, statistical, underwriting, and claims data to the property and casualty insurance industry

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ISO's Professional Staff

- 200+ actuarial professionals, including 37 CAS Fellows and 20 CAS Associates
- 147 Chartered Property Casualty Underwriters (CPCUs)
- 8 Certified Insurance Data Managers (CIDMs)
- 162 members of the Insurance Data Management Association
- PhDs in statistical modeling, engineering, geology, economics, health economics, and many other disciplines

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ISO Offices around the Globe

- Beijing, China
- London, England
- Hampshire, England
- Munich, Germany
- Hyderabad, India
- Tel Aviv, Israel
- Toronto, Canada

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updated 12/18/06

Information

- ISO is the trusted intermediary of proprietary customer information
- Breadth
  - Insurers submit information on hundreds of millions of individual policies
- Accuracy and credibility
  - ISO performs quality checks on data to ensure validity, reasonableness, completeness, and accuracy

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ISO Formation

- State rating laws require annual statistical filings of premium and losses and allow for reporting of data to statistical agent or advisory organizations
- ISO formed in 1971 replacing many state property insurance bureaus, regional and national bureaus for various lines of business
- ISO is an advisory organization that is licensed as a statistical agent with the states
- Most insurers in U.S. report data to one of the licensed statistical agents
- Insurers reporting to ISO – realize benefit of detailed, quality industry data base for analysis

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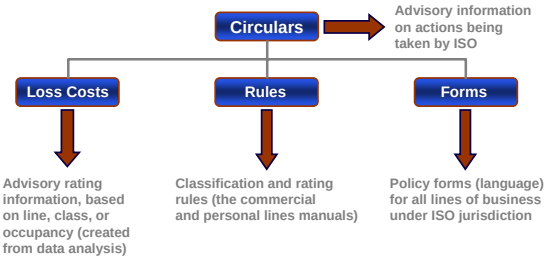
Insurance Services



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Policy Forms

- Provide simplified standard policy language, which lets consumers know what they are buying and agents know what they are selling
- Simplify claim settlement and reduce costly litigation
- Provide benchmarks that help consumers and government make comparisons among insurers on price and coverage

Standard Coverage Definitions ⇨ Uniform Data Collection

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Loss Costs
Advisory prospective

- Reliable projections of average future claim payments and loss adjustment expenses
- Provide a sound basis for insurers to develop their own independent rates
- 11+ billion records in database
  - 4+ billion for commercial lines market
  - 7+ billion for personal lines market
- Available by line, state, territory, and class and for specific risks

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updated 7/9/07

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Industry Data

Features - Statistical Plan Reporting

- Collect additional data beyond regulatory requirements for business purpose of pricing insurance product
- Separate submissions for premiums, paid losses and outstanding losses
- Unit Transaction reporting

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Benefits - Unit Transaction Reporting

- More flexibility in compiling data for analysis
- Enhanced quality and accuracy
  - Edit individual fields and relationships
  - Distributional analysis of data submissions
  - "Drill-down" capability of summarized data reports

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Data Quality Activity

- GIRO Data Quality Working Party
  - findings documented in paper "Dirty Data on Both Sides of the Pond" by Robert Campbell, Louise Francis, Virginia Prevosto, Mark Rothwell, Simon Sheaf
  - Key finding: Data Quality have significant impact on the work of general insurance actuaries
- "Actuarial I. Q. (Information Quality)" by CAS Data Management Educational Materials Working Party
  - Provide educational information on data quality and data management to actuaries

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Actuarial I.Q.

- Examine data for:
  - Validity
  - Accuracy
  - Reasonableness
  - Competeness
  - Timeliness
- Quality data = data appropriate for its purpose
- Quality is relative, not absolute
  - Data used in annual rate study may not be suitable for relativity study
  - Promising variables for Predictive Modeling may not have been coded with that purpose in mind

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Benefits - Uniformity

- Common data elements across lines
- Reflects standardized policy forms, coverage definitions and rating rules for each line
- “Code-as-rated” data allows for homogenous data base

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Statistical Plan Data Elements

- Dates
  - Account, Policy Effective, Accident
- Demographics/Rating Variables
  - Location – state, territory
  - Type of risk – classification
- Amounts
  - Premium, Loss

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Statistical Plan Unit Transaction Reports

Premium Records

Account Date	Policy Effective Date	Policy Expiration Date	Line	State	Class	Exposure	Premium Amount	…

Loss Records

Account Date	Policy Effective Date	Accident Date	Line	State	Class	Paid or Reserve Indicator	Loss Amount	…

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Examples of Rating Variables

General Liability

- **Subline – products liab.**
- **Policy limit**
- **Deductible**
- **Coverage - occurrence**
- **Exposure - sales**

Commercial Property

- **Subline - fire**
- **Class (4 digit)**
- **Coverage – prop. damage**
- **Protection**
- **Construction**
- **Deductible**
- **Coinsurance**
- **Exposure – limit of insur.**

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Unit Transaction Reporting of Losses

Line: **Products Liability**
Year: **2006**
Territory: **001**
Policy Limit: **$500,000**
Class: **011xx**

Occurrences	Incurred Loss
# 1	$10,000
# 2	$50,000
# 3	$250,000
Summary	$310,000

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Classification Examples – General Liability

- ~1100 individual classifications
- Classes grouped into class groups
  - Retail, restaurants, schools, hotels, apartments, offices, services, contracting, distributors, manufacturing, etc.

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Class Group Examples – General Liability

- Premises/Operations “Light Manufacturing” group includes:
  - Baby food, beer/ale, liquor, buttons, doors, food products (dry, frozen, glass/non-glass containers), jewelry, pipes, tobacco products, umbrella
- Products “Manufacturers (Not Food or Drug)” group includes:
  - Billiards, boxes, buttons, china, clock, computer, jewelry, musical instruments

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Classification Examples – Commercial Property Basic Group I

- Less than 200 classes with 22 rating groups
- Classes grouped into Rating Groups:
  - Apartments, other habitational, restaurants, mercantile, schools, offices, services, hotels, hospitals, manufacturing (food, apparel, chemical, metal, wood, other)
- “Other Manufacturing” rating group includes:
  - Leather, paper, printing, plastic, stone, coal, electronics

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Actuarial Analysis of Data

Benefits - Access to Industry Data Base

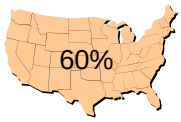
- Reference point for independent pricing
- New market entry
- Development of “Independent” programs

Industry Data Base

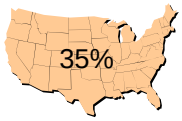
Allows for analysis of :

- Loss cost by state, territory and rating grouping
- Claim cost and frequency trends
- Loss development/payout patterns
- Increased Limits analysis
- Classification and other rating relativities

Statistical Database



of commercial lines market



of personal lines market

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24 Lines of Insurance

Commercial
- Automobile
- Boiler and Machinery
- Businessowners
- Property
- Crime
- Farm
- General Liability
- Inland Marine
- Package Policy
- Medical Professional Liability

- Employment-related Practices Liability
- E-commerce
- Fidelity
- Financial Institutions
- Umbrella/Excess Liability
- Capital Assets (Output Policy)
- Management Protection (D&O)
- Market Segments

Personal
- Automobile
- Dwelling Property
- Homeowners
- Inland Marine
- Personal Liability
- Umbrella

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Stabilization Techniques

- Even large datasets can be volatile
- Extraordinary events create fluctuations
  - Catastrophes
  - Large liability losses
- Can cause wide swings in loss costs

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Stabilization Techniques: Approaches to Reduce Fluctuations

- Basic limits ratemaking for liability lines
- Use of multiple years' data
- Modeling for hurricane and terrorism exposure
- Catastrophe excess loss procedure
- Assign credibility to data

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Loss Cost by State, Territory, Rating Group

- For General Liability - Adjust losses to B/L, developed to ultimate, trended, include all LAE
- For Property - Smooth large losses, normalize cat losses, apply development & trend and include all LAE
- Calculate Aggregate Loss Cost at Current Level (ALCCL) by extending exposures at ISO current manual (loss costs & relativities) level
- Experience Ratio = Adjusted Losses/ALCCL

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Loss Cost by State, Territory, Rating Group

- Reflect credibility of data
- Incorporate hurricane model loss costs for Property
- NOT dependent on reported premium amounts – extend exposures

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Insurance Services Office, Inc.

Claim Cost and Claim Frequency Trends

- Paid vs. Incurred data
- Accident year vs. Calendar year data
- B/L vs. T/L for Liability
- By Deductible for Property

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Loss Development/Payout Patterns

- Paid vs. Incurred data
- B/L vs. T/L for Liability
- By Policy Limit for Liability
- By Deductible
- Incl/Excl Hurricane losses for Property

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Increased Limits Analysis

- B/L Loss Costs - Use large volume of losses capped at basic limit for analysis by state
- Use a broader experience base to develop ILF's to price higher limits
- Individual occurrence losses slotted by size of loss
- Use paid settled occurrences organized by A/Y and payment lag
- Use mixed exponential distribution to smooth empirical data

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Classification and Other Relativity Analysis

- Use broader base multi-state data for analysis
- Traditional – use minimum bias or Bailey's iterative methods for multivariate analysis
- Now – use GLM's relativity analysis
  - Analysis of new limit of insurance relativities for Property along with current relativities for protection, construction, occupancy

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Use of Analysis Outside of U.S.

- Policy form and rating information can be used as reference for similar types of coverage written on non-U.S. based risks - e.g. commercial liability coverage
- Products Liability policy form and rating information can be useful for non-U.S. based risks that export to U.S.
- Use as statistical source of pricing for non-U.S. risks

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