

Insurance Risk 101

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Life Insurance Risk 101

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Overview

- Principles of insurance
- Life insurance products and pricing
- Risks a life insurer faces
- Mortality risk and underwriting
- Other risks



Principles of Insurance

- Gambling vs. Insurance
 - Gambling creates a risk that did not previously exist
 - Insurance transfers the financial consequences of an existing risk for a known dollar amount (premium)



Principles of Insurance

- Law of Large Numbers
 - Statistics (Bernoulli's Theorem)
 - The greater the number of similar exposures, the more predictable the outcome
 - Used to develop reliable assumptions for pricing and risk management



Principles of Insurance

- Risks insured (life insurance)
 - Premature death
 - Outliving accumulated savings



Life Insurance Products

- Term life - Pure death protection
- Permanent life - Term + Savings
 - whole, universal and variable
- Deferred annuities - Tax-deferred savings product (SPDA, VA)
- Payout annuities - income for life with a certain period



Considerations in Setting Premium Rates

- Premium rate adequacy
 - Premiums charged must, in aggregate, cover the benefits promised and the expenses associated with paying the benefits.
 - Inadequate premiums can lead to severe financial problems, including insolvency.



Considerations in Setting Premium Rates

- Premiums must be equitable.
 - Insureds who have similar risk profiles should be charged the same premium.
 - No unfair subsidies (for example, nonsmokers vs. smokers)
 - Equity is a goal.



Considerations in Setting Premium Rates

- Premiums should be fair.
 - The amount charged should not be excessive in relation to the benefits.
 - Market competition is a major factor in ensuring fairness.



The Pricing Process

- Probability of event occurring
- Time value of money
- The benefit promised
- Expenses
- Contingencies (risks)
- Profit



Insurance Company Risks

- Some examples
 - Legal: litigation
 - Operational: mistakes, errors, etc.
 - Pricing: inadequate premiums
 - Regulatory: new requirements
 - Reputation: negative perceptions



Life Insurance Pricing Risks

- **Mortality:** when death occurs
- **Persistency:** how long the customer keeps the policy
- **Expenses:** how efficiently the company operates
- **Investment:** return of and on invested cashflows



Mortality Risk

- Historical perspective
 - The bedrock in the growth and development of the life insurance industry
 - Based on a single-wage-earning family model
 - Premature death of breadwinner had devastating financial consequences



Mortality Risk

- Trends
 - Improvements in life expectancy at virtually every age
 - Traditional model has changed, but the basic concerns regarding the prudent management of mortality risk still exist



Mortality Risk

- Insured vs. Population Data
 - Insured life mortality reflects a selection process (underwriting) to determine the appropriate premium rate classification for the benefit being insured against.
 - Population mortality reflects the general population and does not reflect any selection process (e.g. census data). Many would not qualify for insurance.



Mortality Risk

- The Adverse Selection Problem
 - Buyers usually know more than the insurer about their own health and other risk components.
 - Adverse selection is when a buyer uses this information to gain an advantage over the insurer.
 - Underwriting is used to deter and detect adverse selection.



Underwriting

- Selection
 - The process by which insurers decide whether to issue insurance according to specific terms and prices
- Classification
 - The process of assigning a proposed insured to a group (class) of insureds with approximately the same expected loss probabilities



Underwriting

- Major factors considered
 - Age
 - Gender
 - Physical condition
 - Family history
 - Personal history and habits
 - (e.g. tobacco, alcohol, and drug use; hazardous avocations; financial status)



Underwriting

- Classification Methods
 - Method should accurately measure each factor affecting risk on an equitable yet relatively simple basis.
 - Judgement Method: Requires highly skilled and experienced personnel
 - Numerical Method: Point system where debits and credits are applied to risk factors



Underwriting

Classification Categories

- Standard
 - Preferred, smoker, nonsmoker, other
- Substandard
 - Multiple or flat extra premium
- Decline
 - Not eligible for coverage



Other Risks

- The traditional model has changed.
- Concern about outliving retirement assets is becoming a greater concern than premature death.
- This has caused growth in asset accumulation products.
- Investment risks and competition with banks and securities firms are significant for insurers.



An Overview of Property & Casualty Insurance

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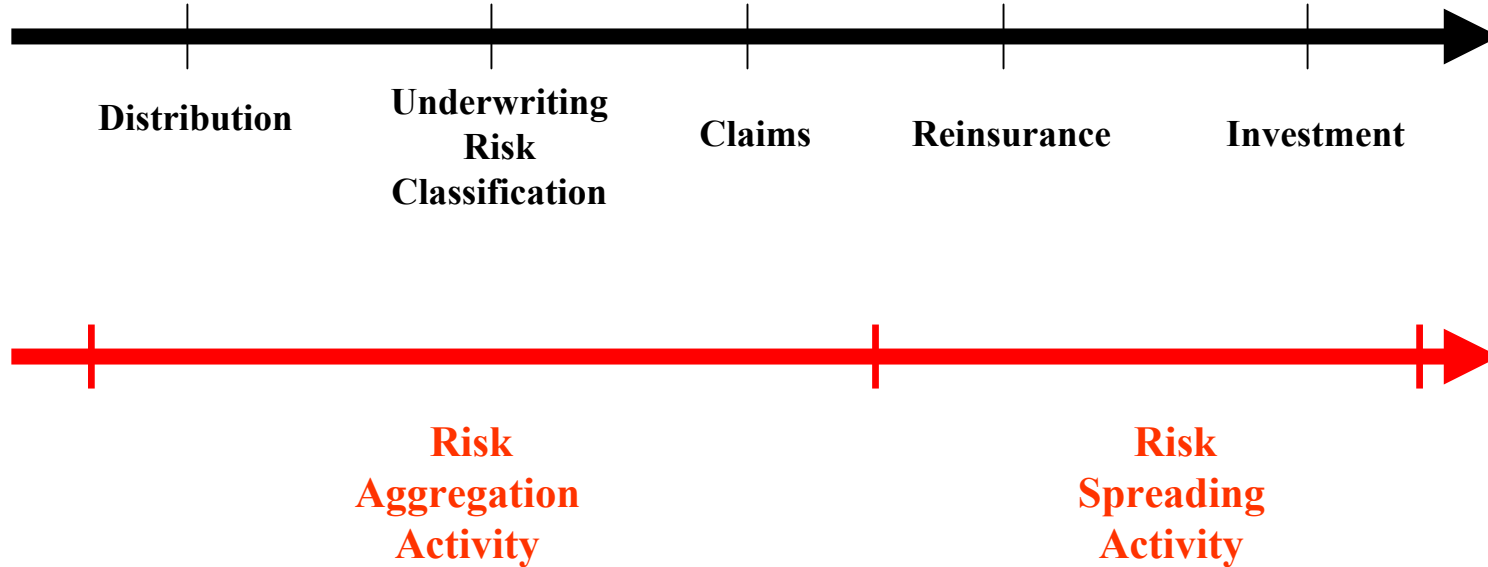
Property & Casualty Insurance

Outline of Discussion

- Insurance Value Chain
- Risk Aggregation Activities
- Risk Spreading Activities



Insurance Value Chain



Insurance Value Chain

P&C Lines of Business (LOB)

- Personal lines
- Commercial lines
- Reinsurance



Insurance Value Chain

Personal Lines

- Personal automobile
- Homeowners
- Fire, allied lines, earthquake
- Inland marine



Insurance Value Chain

Commercial Lines

- Commercial auto
- Commercial multiple peril
- Workers compensation
- Other liability
- Fidelity
- Surety
- Boiler & machinery
- Medical malpractice
- Professional liability
- Other accident & health
- Fire, allied lines, EQ
- Farm-owners multiple peril
- Ocean marine
- Aircraft



Insurance Value Chain

- Risk Aggregation Activities
 - Distribution channels
 - Underwriting services
 - Claims services
- Risk Spreading Activities
 - Reinsurance services
 - Investment services



Risk Aggregation Activity

- **Distribution Channels**

- Direct writers -- Develop, maintain and manage their own agency force
- Agency writers -- Use independent contractors (insurance agents) as their insurance sales force
- Association/Group purchasing programs
- Internet



Risk Aggregation Activity

- **Risk Pooling**

- Each insured contributes to a common fund or pool from which all amounts are paid
- Some insureds pay premiums that are insufficient to adequately cover their actual losses; the premiums of other insureds are used to subsidize those losses
- Law of Large Numbers -- risk reduction

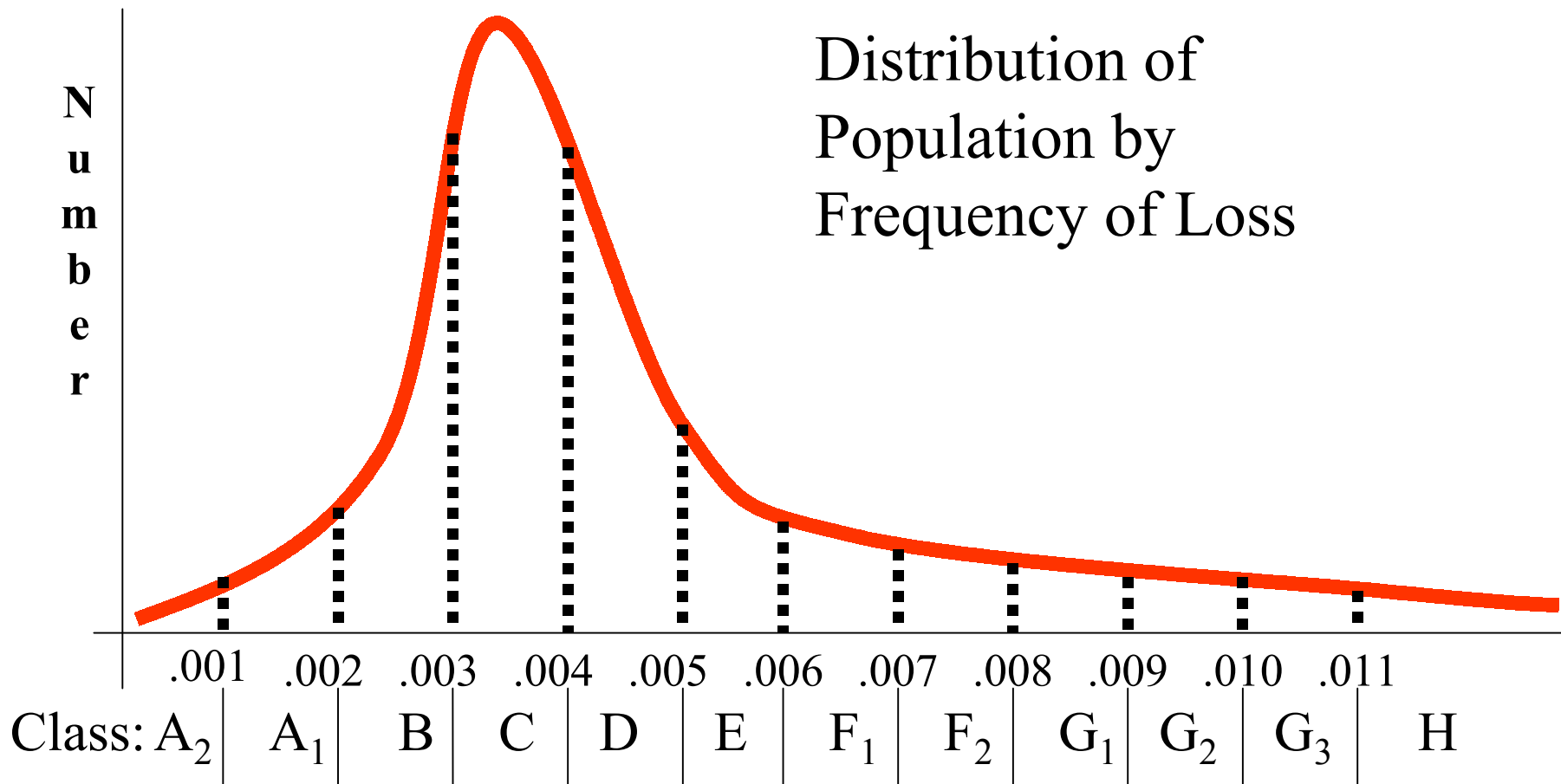


Risk Aggregation Activity

- Underwriting Services
 - Selection
 - The process by which an insurance company decides whether to issue requested insurance.
 - Classification
 - The process of assigning a proposed insured to a group of insureds of approximately the same expected loss probabilities.



Risk Aggregation Activity



Risk Aggregation Activity

- The Adverse Selection Problem
 - The buyer usually knows more about his own risk components than the insurer.
 - This information asymmetry encourages adverse selection by the buyer.
 - Underwriting is necessary to deter and detect adverse selection.
 - Inadequate underwriting will cause an antiselection spiral and collapse of the risk pool.



Risk Aggregation Activity

- Underwriting Guiding Principles
 - Large standard groups
 - Balancing size of substandard groups
 - Balance within each class
 - Equity among insureds
 - Social acceptability
 - Recognition of underlying loss assumptions



Risk Aggregation Activity

- Claims Services
 - Variable Claim Values
 - Efficacy in claims settlement -- Paying the “right” amount for claims
 - Efficiency in claims operations -- Performing services at the “lowest” cost



Risk Spreading Activity

- Reinsurance Services
 - Loss Portfolio Management
 - Solvency Risk
-
- Individual claim severity risk
 - Catastrophe risk
 - Pricing risk



Risk Spreading Activity

- Investment Services
 - Investment portfolio management
 - Asset/Liability matching
 - Asset class allocation
 - Investment risks
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- Market risk
 - Liquidity risk
 - Default risk
 - Political risk
 - Exchange risk
 - Interest rate risk



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