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 exposurers, 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 period certain
Considerations in Setting Premium Rates

• Premium rate adequacy
  – Premiums charged must in aggregate, cover the benefits promised and 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 to 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 press
Life Insurance Pricing Risks

- Mortality - when death occurs
- Persistency - how long the customer keeps the policy
- Expenses - how efficient 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
  – Improvement 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 that would not qualify for insurance
Mortality Risk

• The Adverse Selection Problem
  – The buyer usually knows 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 on 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
    • (eg. 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 for 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 is 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

- Distribution
- Underwriting Risk Classification
- Claims
- Reinsurance
- Investment

- Risk Aggregation Activity
- Risk Spreading Activity
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

Distribution of Population by Frequency of Loss
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

Individually Claim Severity Risk
Catastrophe Risk
Pricing Risk
Risk Spreading Activity

Investment Services

• Investment Portfolio Management
• Asset/Liability Matching
• Asset Class Allocation
• Investment Risks

  > Market Risk  > Political Risk
  > Liquidity Risk  > Exchange Risk
  > Default Risk  > Interest Rate Risk
Insurance Risk 101

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