Chapter Two

The Insurance Mechanism

Definition of Insurance

- ***Insurance*** is the pooling of fortuitous losses by transfer of such risks to insurers, who agree to indemnify insureds for such losses, to provide other pecuniary benefits on their occurrence, or to render services connected with the risk.

Basic Characteristics of Insurance

Pooling of losses

- Spreading losses incurred by the few over the entire group
- Risk reduction based on the ***Law of Large Numbers***
- There should be a large number of similar but not identical exposure units that are subject to the same peril.

- Example:
  - Two business owners own identical buildings valued at $50,000
  - There is a 10 percent chance each building will be destroyed by a peril in any year; loss to either building is an independent event
  - Expected value and standard deviation of the loss for each owner is:

Basic Characteristics of Insurance

$$Expected\ loss = 0.90 * \$0 + 0.10 * \$50{,}000 = \$5{,}000$$

$$\begin{aligned} Standard\ deviation &= \sqrt{0.90(0 - \$5{,}000)^2 + 0.10(\$50{,}000 - \$5{,}000)^2} \\ &= \$15{,}000 \end{aligned}$$

Basic Characteristics of Insurance

- <u>Example, continued:</u>
  - If the owners instead pool (combine) their loss exposures, and each agrees to pay an equal share of any loss that might occur:

Basic Characteristics of Insurance

$$\begin{aligned} Expected\ loss &= 0.81*\$0 + 0.09*\$25{,}000 + 0.09*\$25{,}000 + 0.01*\$50{,}000 \\ &= \$5{,}000 \end{aligned}$$

$$\begin{aligned} Standard\ deviation &= \sqrt{0.81(0-\$5{,}000)^2 + (2)(0.09)(\$25{,}000-\$5{,}000)^2 + 0.01(\$50{,}000-\$5{,}000)^2} \\ &= \$10{,}607 \end{aligned}$$

Basic Characteristics of Insurance

- As additional individuals are added to the pooling arrangement, the standard deviation continues to decline while the expected value of the loss remains unchanged.

Payment of fortuitous losses

- Insurance pays for losses that are unforeseen, unexpected, and occur as a result of chance

Basic Characteristics of Insurance

- **Risk transfer**
  - A pure risk is transferred from the insured to the insurer, who typically is in a stronger financial position.

- **Indemnification**
  - The insured is restored to his or her approximate financial position prior to the occurrence of the loss

Characteristics of an Ideally Insurable Risk

1- Large number of exposure units

- to predict average loss
- The purpose of this requirement is to enable the insurer to predict loss based on the law of large number.

Characteristics of an Ideally Insurable Risk

2- Accidental and unintentional loss

- **to control moral hazard, because if an intentional losses were paid, moral hazard would be substantially increased and premiums would rise as a result.**
- **to assure randomness, because law of large number is based on the random occurrence of events.**

Characteristics of an Ideally Insurable Risk

3- Determinable and measurable loss

- **to facilitate loss adjustment**
  - **insurer must be able to determine if the loss is covered and if so, how much should be paid.**
- **The loss should be definite as to cause, time, place and amount.**

Characteristics of an Ideally Insurable Risk

4- No catastrophic loss

- to allow the pooling technique to work
- exposures to catastrophic loss can be managed by:
  - dispersing coverage over a large geographic area
  - using reinsurance
  - catastrophe bonds

Characteristics of an Ideally Insurable Risk

5- Calculable chance of loss

- to establish an adequate premium to pay all claims and expenses and yield a profit during policy period.
- The insurer should be able to calculate both the average frequency and the average severity of future losses with some accuracy.

Characteristics of an Ideally Insurable Risk

6- Economically feasible premium

- so people can afford to buy
- Premium must be substantially less than the face value of the policy
- To have an economically feasible premium, the chance of loss must relatively be low.

Characteristics of an Ideally Insurable Risk

- ***<u>Based on these requirements</u>***:
  - Most personal, property and liability risks can be insured
  - Market risks, financial risks, production risks and political risks are difficult to insure

Exhibit 2.1 Risk of Fire as an Insurable Risk

Requirements	*Does the risk of fire satisfy the requirements?*
1. Large number of exposure units	Yes. Numerous exposure units are present.
2. Accidental and unintentional loss	Yes. With the exception of arson, most fire losses are accidental and unintentional.
3. Determinable and measurable loss	Yes. If there is disagreement over the amount paid, a property insurance policy has provisions for resolving disputes.
4. No catastrophic loss	Yes. Although catastrophic fires have occurred, all exposure units normally do not burn at the same time.
5. Calculable chance of loss	Yes. Chance of fire can be calculated, and the average severity of a fire loss can be estimated in advance.
6. Economically feasible premium	Yes. Premium rate per $100 of fire insurance is relatively low.

<u>Exhibit 2.2</u> Risk of Unemployment as an Insurable Risk

Requirements	*Does the risk of unemployment satisfy the requirements?*
1. Large number of exposure units	Not completely. Although there are a large number of employees, predicting unemployment is difficult because of the different types of unemployment and different types of labor.
2. Accidental and unintentional loss	No. A large proportion of unemployment is due to individuals who voluntarily quit their jobs.
3. Determinable and measurable loss	Not completely. The level of unemployment can be determined, but the measurement of loss is difficult. Some unemployment is involuntary; however, some unemployment is voluntary.
4. No catastrophic loss	No. A severe national recession or depressed local business conditions could result in a catastrophic loss.
5. Calculable chance of loss	No. The different types of unemployment generally are too irregular to estimate the chance of loss accurately.
6. Economically feasible premium	No. Adverse selection, moral hazard, and the potential for a catastrophic loss could make the premium unaffordable.

Adverse Selection and Insurance

- ***Adverse selection*** is the tendency of persons with a higher-than-average chance of loss to seek insurance at standard rates
- If not controlled, adverse selection result in higher-than-expected loss levels
- *Adverse selection can be controlled by*:
  - careful underwriting (selection and classification of applicants for insurance)
  - policy provisions (e.g., suicide clause in life insurance)

Insurance vs. Gambling

Insurance

- Insurance is a technique for handing an already existing pure risk
- Insurance is socially productive:
  - both parties have a common interest in the prevention of a loss

Gambling

- Gambling creates a new speculative risk
- Gambling is not socially productive

  The winner's gain comes at the expense of the loser

Insurance vs. Hedging

Insurance

- Risk is transferred by a contract
- Insurance involves the transfer of insurable risks
- Insurance can reduce the objective risk of an insurer through the Law of Large Numbers

Hedging

- Risk is transferred by a contract
- Hedging involves risks that are typically uninsurable
- Hedging does not result in reduced risk

Types of Insurance

I) Private Insurance

- Life and Health
- Property and Liability

II) Government Insurance

- Social Insurance
- Other Government Insurance

I) Private Insurance

- **Life and Health**
  - Life insurance pays death benefits to beneficiaries when the insured dies
  - Health insurance covers medical expenses because of sickness or injury
  - Disability plans pay income benefits

I) Private Insurance

- **Property and Liability**
  - Property insurance indemnifies property owners against the loss or damage of real or personal property
  - Liability insurance covers the insured's legal liability arising out of property damage or bodily injury to others
  - Casualty insurance refers to insurance that covers whatever is not covered by fire, marine, and life insurance

I) Private Insurance

- Private insurance coverage can be grouped into ***two major categories***:
  - **Personal lines**
    - coverage that insure the real estate and personal property of individuals and families or provide protection against legal liability
  - **Commercial lines**
    - coverage for business firms, nonprofit organizations, and government agencies

II) Government Insurance

- **Social Insurance Programs**
  - Financed entirely or in large part by contributions from employers and/or employees
  - Benefits are heavily weighted in favor of low-income groups
  - Eligibility and benefits are prescribed by statute
  - Examples:
    - Social Security, Unemployment, Workers Compensation

- **Other Government Insurance Programs**
  - Found at both the federal and state level
  - Examples:
    - Federal flood insurance, state health insurance pools

Social Benefits of Insurance

1- Indemnification for Loss

- Contributes to family and business stability

2- Reduction of Worry and Fear

- Insureds are less worried about losses

3- Source of Investment Funds

- Premiums may be invested, promoting economic growth

Social Benefits of Insurance

4- Loss Prevention

- Insurers support loss-prevention activities that reduce direct and indirect losses

5- Enhancement of Credit

- Insured individuals are better credit risks than individuals without insurance

Social Costs of Insurance

1- Cost of Doing Business

- Insurers consume resources in providing insurance to society
- An expense loading is the amount needed to pay all expenses, including commissions, general administrative expenses, state premium taxes, acquisition expenses, and an allowance for contingencies and profit

2- Cost of Fraudulent and Inflated Claims

- Payment of fraudulent or inflated claims results in higher premiums to all insureds, thus reducing disposable income and consumption of other goods and services