Chapter 2
Insurance and Risk

■ Teaching Note

Three areas should be emphasized in teaching this chapter. First, the nature of insurance can be discussed. Second, the requirements of an insurable risk should be stressed. These first two requirements are ideal requirements and are seldom met completely in the real world. Finally, it is also worthwhile to show how insurance differs from both gambling and speculation.

The remaining material is descriptive and fairly easy to grasp. It is not necessary to discuss in detail the various fields of insurance other than to point out that the different fields of insurance are covered in future chapters. Likewise, the social benefits of insurance are quickly grasped by students and may not require a large amount of class time. However, it is worthwhile to spend some time on the less obvious costs of insurance, such as moral and attitudinal (morale) hazard. Point out that moral hazard has increased enormously in recent years, especially in the submission of fraudulent claims.

■ Outline

I. Meaning of Insurance

A. Definition of Insurance

B. Basic Characteristics of Insurance
   1. Pooling of losses
   2. Payment of fortuitous losses
   3. Risk transfer
   4. Indemnification

II. Requirements of an Ideally Insurable Risk

A. General Requirements
   1. Large number of exposure units
   2. Accidental and unintentional loss
   3. Determinable and measurable loss
   4. No catastrophic loss
   5. Calculable chance of loss
   6. Economically feasible premium

B. Application of the Requirements
   1. How the risk of fire to a private dwelling satisfies the requirements
   2. How the risk of unemployment fails to meet the requirements

C. Adverse Selection and Insurance
   1. Nature of adverse selection
   2. Consequences of adverse selection

III. Insurance and Gambling Compared

A. Insurance eliminates a pure risk, while gambling creates a new speculative risk.

B. Insurance is socially productive, while gambling is socially unproductive.

IV. Insurance and Hedging Compared

A. Insurance transfers a pure risk, while hedging involves the transfer of a speculative risk.

B. Insurance reduces objective risk, while hedging does not.

V. Types of Insurance

A. Private Insurance
   1. Life and health insurance
   2. Property and liability insurance

B. Government Insurance
   1. Social insurance
   2. Other government insurance programs

VI. Social Benefits and Costs of Insurance

A. Benefits of Insurance to Society
   1. Indemnification for loss
   2. Less worry and fear
   3. Source of investment funds
   4. Loss prevention
   5. Enhancement of credit

B. Costs of Insurance to Society
   1. Cost of doing business
   2. Fraudulent claims
   3. Inflated claims

■ Answers to Case Application

a. This is not insurance. Although the risk of a defective television set is transferred to the manufacturer, there is no pooling of losses.

b. This is not insurance. Although the risk of defective tires for the first 50,000 miles is transferred to the manufacturer, there is no pooling of losses.

c. This guarantee is not insurance. Although the risk of a defective home is transferred to the builder, there is no pooling of losses, which is the essence of insurance. Any losses would fall directly on the builder.

d. This is not insurance. The risk of default has been transferred to the cosigner. If the debtor defaults, the cosigner must make the payments. The loss would fall directly on the cosigner, and there is no pooling of losses.

e. The elements of insurance are present here. First, risk transfer is present; the homeowner transfers the risk of fire to the group. Second, pooling of losses is also present. Pooling is the essence of insurance. Fire losses would be pooled over the entire group, and average loss is substituted for actual loss. Third, fire losses generally are fortuitous. Finally, the homeowner would be indemnified for any loss.

Answers to Review Questions

1. Insurance plans have four distinct characteristics:
   (a) *Pooling.* Losses incurred by the few are spread over the entire group so that in the process, average loss is substituted for actual loss.
   (b) *Fortuitous loss.* Insurance plans provide for the payment of fortuitous losses. A fortuitous loss is one that is unforeseen and unexpected and occurs as a result of chance.
   (c) *Risk transfer.* In private insurance, a pure risk is transferred from the insured to the insurer, which typically is in a better financial position to pay the loss than the insured.
   (d) *Indemnification.* Compensation is given to the victim of a loss, in whole or in part, by payment, repair, or replacement.

2. The law of large numbers states that the greater the number of exposures, the more closely will the actual results approach the probable results expected from an infinite number of exposures. As the number of exposures increases, the relative variation of actual loss from expected loss will decline. Thus, the insurer can predict future losses with a greater degree of accuracy as the number of exposures increases. This is important, since an actuary must charge a premium that is adequate for paying all losses and expenses during the policy period. The lower the degree of objective risk, the more confidence an insurer has that the actual premium charged will be sufficient to pay all claims and expenses and leave a margin for profit.

3. There are several requirements of an ideally insurable risk:
   (a) There must be a large number of exposure units.
   (b) The loss must be accidental and unintentional.
   (c) The loss must be determinable and measurable.
   (d) The loss should not be catastrophic.
   (e) The chance of loss must be calculable.
   (f) The premium must be economically feasible.

4. Insurers can deal with the problem of a catastrophe loss by (1) reinsurance, (2) avoiding the concentration of risk by dispersing coverage over a large geographical area, and (3) use of certain financial instruments in the capital markets, such as catastrophe bonds.

5. These risks are generally uninsurable for several reasons. First, many of these risks are speculative risks, which are difficult to insure privately. Second, the potential for a catastrophic loss is great; this is particularly true for political risks, such as the risk of war. Finally, calculation of the correct premium may be difficult because the chance of loss cannot be accurately estimated.

6. (a) Adverse selection is the tendency of persons with a higher-than-average chance of loss to seek insurance at standard (average) rates, which, if not controlled by underwriting, results in higher-than-expected loss levels.
   (b) Adverse selection can be controlled by careful underwriting, by charging higher premiums to substandard applicants for insurance, and by certain policy provisions.

7. Insurance differs from gambling in two ways. First, gambling creates a new speculative risk that did not exist before, while insurance is a technique for handling an already existing pure risk. Second, gambling is socially unproductive, since the winner's gain comes at the expense of the loser. Insurance is always socially productive, since both the insured and insurer win if the loss does not occur.

8. Insurance differs from hedging. An insurance transaction usually involves the transfer of risks that are insurable, since the requirements of an insurable risk generally can be met. Hedging is a technique for handling risks that are typically uninsurable, such as protection against a substantial decline in the price of commodities. A second difference is that insurance may reduce objective risk because of application of the law of large numbers. In contrast, hedging typically involves only risk transfer, not risk reduction.

9. (a) The major fields of private insurance are life and health insurance and property and liability insurance (also called property and casualty insurance).
   (b) Property and casualty coverages can be divided into personal lines and commercial lines. Personal lines include private passenger auto insurance, homeowners insurance, umbrella liability insurance, and boat owners insurance.

   Commercial lines include fire and allied lines insurance, commercial multiple peril insurance, general liability insurance, workers compensation insurance, commercial auto insurance, accident and health insurance, inland marine and ocean marine insurance, professional liability insurance, equipment breakdown insurance, fidelity and surety bonds, and crime insurance.

10. (a) Social insurance programs are government insurance programs with certain characteristics. The programs generally are enacted into law to deal with social and economic problems. The programs generally are compulsory and financed by contributions from covered employers and employees; benefits are paid from specifically earmarked funds; benefits are skewed or weighted in favor of lower income groups; benefit amounts generally are related to the covered individual's earnings; and eligibility requirements and benefit rights are prescribed by statute.
    (b) Major social insurance programs are the following:
    - Old-age, survivors, and disability insurance (Social Security)
    - Medicare
    - Unemployment insurance
    - Workers compensation
    - Compulsory temporary disability insurance
    - Railroad Retirement Act

■ Answers to Application Questions

1. (i) Risk of fire
   (a) *Large number of exposure units.* This is generally met, since there are millions of homes that are insured.
   (b) *Accidental and unintentional loss.* This requirement is generally met, since most insureds do not deliberately start a fire.
   (c) *Determinable and measurable loss.* A fire loss can be determined, and it can be measured. In case of disagreement, a property insurance policy has a provision for resolving disputes.
   (d) *No catastrophic loss.* This requirement is met, since most homes do not burn at the same time.
   (e) *Calculable chance of loss.* Insurers can estimate within ranges the probability of a fire loss.
   (f) *Economically feasible premium.* For most insureds, this requirement is fulfilled.

   (ii) Risk of war
   (a) *Large number of exposure units.* This requirement is not fulfilled. It is impossible to estimate accurately the number of wars that will occur based on the law of large numbers.
   (b) *Accidental and unintentional loss.* This requirement is not met. Most wars are not accidental, but intentional.

(c) *Determinable and measurable loss.* Although a war loss can be determined, the measurement of loss would be difficult.

(d) *No catastrophic loss.* This requirement is not fulfilled, since large numbers of exposure units would simultaneously incur losses.

(e) *Calculable chance of loss.* This requirement cannot be met.

(f) *Economically feasible premium.* Because of the catastrophic potential of war, the premiums would not be economically feasible.

2. (a) (1) Indemnification means that insureds are restored to their former financial position after a loss occurs, either partly or wholly. As a result, individuals and families can maintain their economic security and are less likely to apply for public assistance or welfare, or seek financial assistance from relatives and friends.

(2) Insurance makes a borrower a better credit risk because it guarantees the value of the borrower's collateral, or gives greater assurance that the loan will be repaid. For example, life insurance can be used to pay off a bank loan if the creditor dies prematurely, and so makes the creditor a better credit risk.

(3) Premiums are collected in advance, and funds not needed to pay immediate losses and expenses can be loaned to business firms. These funds typically are invested in capital goods, such as housing developments, shopping centers, new plants, and machinery and equipment. Since the stock of capital goods is increased, economic growth and full employment are promoted. In addition, since the supply of loanable funds is increased, the cost of capital to business firms is lower than it would be in the absence of insurance.

(b) The major social and economic costs of insurance are the following:

- Cost of doing business
- Fraudulent claims
- Inflated claims

3. (a) Ideal requirements of an insurable risk:

- Large number of exposure units
- Accidental and unintentional loss
- Determinable and measurable loss
- No catastrophe loss
- Calculable chance of loss
- Economically feasible premium

(b) The requirement of not having a catastrophe loss is not met because large numbers of exposure units in a flood zone would be incurring losses at the same time. Also, the requirement of an economically feasible premium generally is not met. Without a government backup, premiums for flood insurance in major flood zones generally would be unaffordable for many insureds.

4. (a) Life insurance can provide the needed funds for a college education.

(b) Auto liability insurance will protect the parents if Danielle negligently injures someone while driving a family car.

(c) An individual or group disability income policy will provide periodic income payments if Jacob becomes totally disabled.

(d) A homeowners policy will provide the desired protection. Windstorm and hurricanes are covered perils.

(e) A commercial general liability insurance policy will cover Nathan if a customer is injured in his store.