Introduction to Risk

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Outline

- **Definition of Risk**
- **Chance of Loss**
- **Peril and Hazard**
- **Classification of Risk**
- **Major Personal Risks and Commercial Risks**

Objectives

- Understand the whole concept of risk
- Identify the major pure risks that are associated with great economic insecurity.

Definition of Risk

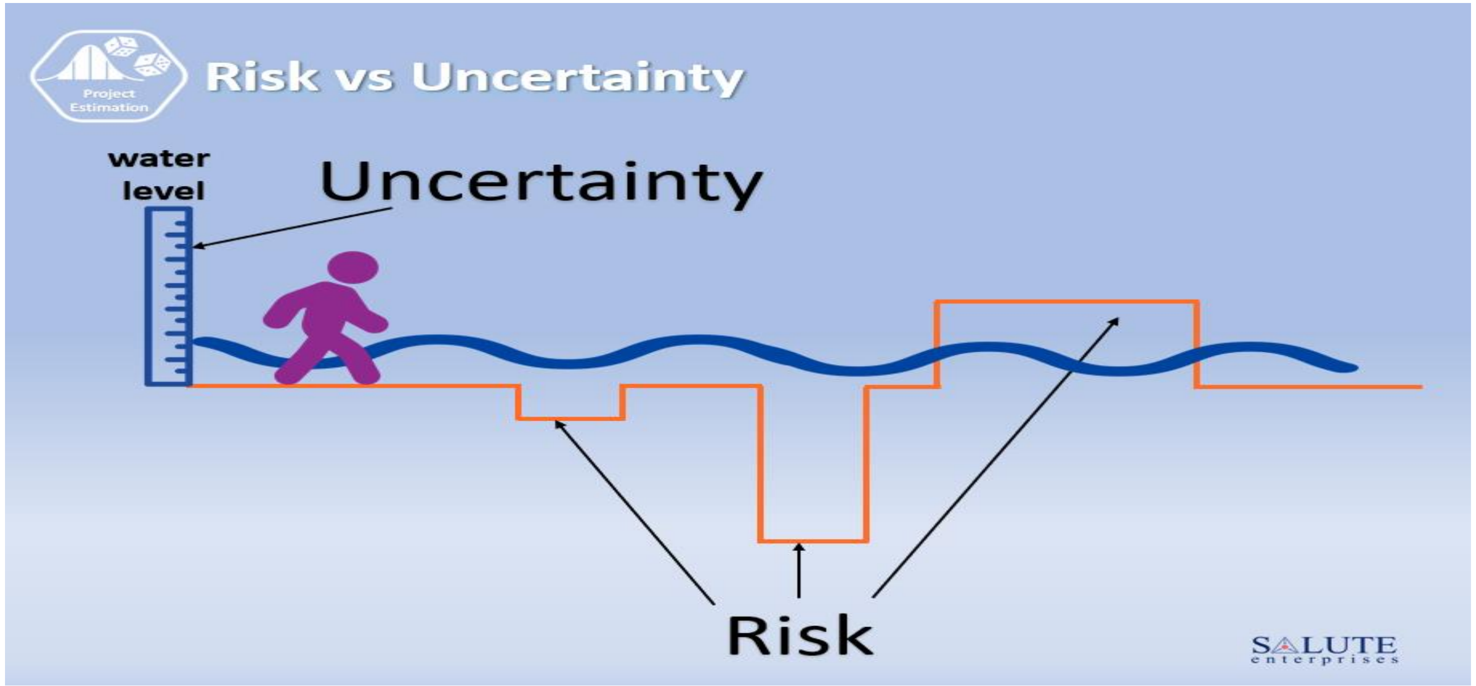
What is Risk?

The term risk is an ambiguous term and has different meanings,

- Risk is the uncertainty about the outcome or payoff of an investment in the future.
- Risk is defined as uncertainty concerning the occurrence of a loss.
- Risk is the possibility of loss.
- Risk is the uncertainty relating to an event that results in financial loss, which can be measured quantitatively.

Definition of Risk

What is the difference between risk and Uncertainty?



- The term ***risk*** is used in situations where the probabilities of possible outcomes are known or can be estimated with some degree of accuracy, whereas ***uncertainty*** is used in situations where such probabilities cannot be estimated.

Definition of Risk

There are two important elements that must exist in the definition of risk.

- **The probability of loss**: If risk exists, it must be possible for loss to occur. No risk exist when the probability of loss is either zero or 100% .

- **Measurement of the probability of loss**: If the risk exists, the probability of loss should be measured. The degree of risk must be measurable, example Low risk, Moderate risk and/or High risk.

  - **Objective Risk (also called degree of risk):** This is defined as the relative variation of actual loss from expected loss.

  For example, assume that a property insurer has 10,000 houses insured over a long period and, on average, 100 houses, burn each year. However, it would be rare for exactly 100 houses to burn each year. In some years, as few as 90 houses may burn; in other years, as many as 110 houses may burn. Thus, there is a variation of 10 houses from the expected number of 100. This relative variation of actual loss from expected loss is known as objective risk.

Definition of Risk

- **Subjective risk (perceived risk):** This is defined as uncertainty based on a person's mental condition or state of mind.

  - For example, assume that a driver with several convictions for drunk driving is drinking heavily in a neighborhood bar and foolishly attempts to drive home. The driver may be uncertain whether he will arrive home safely without being arrested by the police for drunk driving. This mental uncertainty or perception is called subjective risk.

- The impact of subjective risk varies depending on the individual. Two persons in the same situation can have a different perception of risk, and their behavior may be altered accordingly.

- High subjective risk often results in conservative and prudent behavior, whereas low subjective risk may result in less conservative behavior.

Chance of Loss

Change of loss is also known as Probability of loss. Like risk, probability has both objective and subjective aspects.

- **Objective probability**: This refers to the long-run relative frequency of an event based on the assumptions of an infinite number of observations and of no change in the underlying conditions. Objective probabilities can be determined in two ways.

  - Objective probability can be determined by ***deductive reasoning***. These probabilities are called ***a priori probabilities***. For example, the probability of getting a head from the toss of a perfectly balanced coin is 1/2 because there are two sides, and only one is a head.

  - Objective probabilities can be determined ***by inductive reasoning*** . For example, the probability that a person age 21 will die before age 26 cannot be logically deduced. However, by a careful analysis of past mortality experience, life insurers can estimate the probability of death and sell life insurance policy issued at age 21.

Chance of Loss

- **Subjective probability:** This is the individual's personal estimate of the chance of loss. example, people who buy a lottery ticket on their birthday may believe it is their lucky day and overestimate the small chance of winning. A wide variety of factors can influence subjective probability, including a person's age, gender, intelligence, education, and the use of alcohol or drugs.

<u>Difference between Change of Luck and Objective Risk</u>

Chance of loss is the probability that an event that causes a loss will occur. Objective risk on the other hand, is the relative variation of actual loss from expected loss.

For example, assume that a property insurer has 10,000 homes insured in Baghdad and 10,000 homes insured in Erbil, and that the chance of a fire in each city is 1 percent. That is, on average, 100 homes should burn annually in each city (***Chance of Luck***). However, if the annual variation in losses ranges from 75 to 125 in Erbil, but only from 90 to 110 in Baghdad, ***objective risk*** is greater in Erbil even though the chance of loss in both cities is the same.

Peril and Hazard

- **Peril**: Peril is defined as the cause of loss. If a house burns because of a fire, the peril or cause of loss is the fire. If a car is damaged in a collision with another car, collision is the peril, or cause of loss.

  - Common perils that cause loss to property include fire, lightning, windstorm, hail, tornado, earthquake, flood, burglary, and theft.

- A hazard is a condition that creates or increases the frequency or severity of loss. There are four major types of hazards:

- Physical hazard
- Moral hazard
- Attitudinal hazard (morale hazard)
- Legal hazard

Peril and Hazard

- **Physical Hazard**: A physical hazard is a physical condition that increases the frequency or severity of loss. Examples of physical hazards include icy roads that increase the chance of an auto accident, defective wiring in a building that increases the chance of fire, and a defective lock on a door that increases the chance of theft.

- **Moral Hazard:** Moral hazard is dishonesty or character defects in an individual that increase the frequency or severity of loss. Examples of moral hazard in insurance include faking an accident to collect benefits from an insurer, submitting a fraudulent claim, inflating the amount of a claim, and intentionally burning unsold merchandise that is insured. Murdering the insured to collect the life insurance proceeds is another important example of moral hazard.

- Moral hazard is present in all forms of insurance, and it is difficult to control. Because of moral hazard, insurance premiums are higher for everyone.

Peril and Hazard

- **Attitudinal Hazard (Morale Hazard)**: This is carelessness or indifference to a loss, which increases the frequency or severity of a loss. Examples of attitudinal hazard include leaving car keys in an unlocked car, which increases the chance of theft; leaving a door unlocked, which allows a burglar to enter; and changing lanes suddenly on a congested expressway without signaling, which increases the chance of an accident.

- **Legal Hazard:** Legal hazard refers to characteristics of the legal system or regulatory environment that increase the frequency or severity of losses. Examples include adverse jury verdicts or large damage awards in liability lawsuits; statutes that require insurers to include coverage for certain benefits in health insurance plans, such as coverage for alcoholism.

Classification of Risk

Risk can be classified into several distinct classes. The most important include the following:

- Pure and speculative risk
- Diversifiable risk and non-diversifiable risk
- Enterprise risk
- Systemic risk

❑ **PURE RISK AND SPECULATIVE RISK**: ***Pure risk*** is defined as a situation in which there are only the possibilities of loss or no loss. The only possible outcomes are adverse (loss) and neutral (no loss). Examples of pure risks include premature death, job-related accidents, catastrophic medical expenses, and damage to property from fire, lightning, flood, or earthquake.

❑In contrast, ***speculative risk*** is defined as a situation in which either profit or loss is possible. For example, if you purchase 100 shares of common stock, you would profit if the price of the stock increases but would lose if the price declines. Other examples include betting on a horse race, and starting a business. In these situations, both profit and loss are possible.

Classification of Risk

It is important to distinguish between pure and speculative risks for three reasons:

- Private insurers generally concentrate on pure risks and do not emphasize the insurance of speculative risks. However, ***there are exceptions***. Some investors will insure institutional portfolio investments and municipal bonds against loss. Also, enterprise risk management is another important exception.

- The law of large numbers can be applied more easily to pure risks than to speculative risks. The law of large numbers is important because it enables insurers to predict future loss experience. In contrast, it is generally more difficult to apply the law of large numbers to speculative risks to predict future loss experience.

- Society may benefit from a speculative risk even though a loss occurs, but is harmed if a pure risk is present and a loss occurs. For example, a firm may develop new technology for producing inexpensive computers. As a result, some competitors may be forced into bankruptcy. But still there is a societal benefit.

Classification of Risk

- **DIVERSIFIABLE RISK AND NON-DIVERSIFIABLE RISK**: ***Diversifiable risk*** is a risk that affects only individuals or small groups and not the entire economy. It is a risk that can be reduced or eliminated by diversification. For example, a diversified portfolio of stocks, bonds, and certificates of deposit (CDs) is less risky than a portfolio that is 100 percent invested in common stocks.

  - Because diversifiable risk affects only specific individuals or small groups, it is also called ***nonsystematic risk or particular risk***. Examples include car thefts, robberies, and dwelling fires. Only individuals and business firms that experience such losses are affected, not the entire economy.

- On the other hand, ***non-diversifiable risk*** is a risk that affects the entire economy or large numbers of persons or groups within the economy. It is a risk that cannot be eliminated or reduced by diversification. Examples include rapid inflation, cyclical unemployment, war, hurricanes, floods, and earthquakes because. Because non-diversifiable risk affects the entire economy or large numbers of persons in the economy, it is also called ***fundamental risk***.

Classification of Risk

- **ENTERPRISE RISK**: This is a term that encompasses all major risks faced by a business firm. Such risks include pure risk, speculative risk, strategic risk, operational risk, and financial risk.

  - Strategic risk refers to uncertainty regarding the firm's financial goals and objectives; for example, if a firm enters a new line of business, the line may be unprofitable.

  - Operational risk results from the firm's business operations. For example, a bank that offers online banking services may incur losses if "hackers" break into the bank's computer.

  - Financial risk refers to the uncertainty of loss because of adverse changes in commodity prices, interest rates, foreign exchange rates, and the value of money. For example, a food company that agrees to deliver cereal at a fixed price to a supermarket chain in six months may lose money if grain prices rise.

Classification of Risk

Enterprise risk is becoming more important in ***commercial risk management***, which is a process that organizations use to identify and treat major and minor risks.

By packaging major risks into a single program, the firm can offset one risk against another. As a result, overall risk can be reduced. As long as all risks are not perfectly correlated, the combination of risks can reduce the firm's overall risk.

Treatment of financial risks typically requires the use of complex hedging techniques, financial derivatives, futures contracts, options, and other financial instruments.

- ❑ **SYSTEMIC RISK**: This is the risk of collapse of an entire system or entire market due to the failure of a single entity or group of entities that can result in the breakdown of the entire financial system. Example the 2008/2009 Financial crisis.

Major Personal Risks and Commercial Risks

What is Personal Risk?

- **Personal risks**: These are risks that directly affect an individual or family. They involve the possibility of the substantial loss or reduction of earned income, additional expenses, and the depletion of financial assets. Major personal risks that can cause great economic insecurity include the following:

- Premature death
- Retirement risks
- Poor health
- Unemployment
- Drug addiction and Alcoholism

Major Personal Risks and Commercial Risks

- **Premature Death:** Premature death is the death of a family head with unfulfilled financial obligations. These obligations include dependents to support, a mortgage to be paid off, children to educate, and credit cards or installment loans to be paid off.

Premature death can cause economic insecurity only if the deceased has dependents to support or dies with unsatisfied financial obligations. Thus, the death of a 7-year-old child is not “premature” in the economic sense, as small children generally are not working and contributing to the financial support of the family.

- **Retirement risks**: The major personal risk during retirement is inadequate income, as a result, they will be exposed to considerable economic insecurity. The majority of workers experience a substantial reduction in their money incomes when they retire, which can result in a reduced standard of living. This generally is inadequate for many older retired workers with substantial additional expenses, such as high uninsured medical bills, high property taxes, or a substantial mortgage, or credit cards to be paid off.

Major Personal Risks and Commercial Risks

- **Poor Health**: Poor health is another major personal risk that can cause great economic insecurity. The risk of poor health includes both the payment of catastrophic medical bills and the loss of earned income. The costs of hospitalization, major surgery, diagnostic tests, and prescription drugs have increased substantially in recent years.

- **Unemployment**: Unemployment is a major cause of economic insecurity. Unemployment can result from business cycle downswings, technological and structural changes in the economy, seasonal factors, imperfections in the labor market, and other causes as well.

- **Drug addiction and Alcoholism**: Addiction to alcohol or drugs is a serious national problem and is an important cause of economic insecurity. According to the National Council on Alcoholism and Drug Dependence of America (NCADD), one in every 12 adults, suffers from alcohol abuse or dependence, more than half of all adults have a family history of alcoholism or drinking problem; more than 7 million children reside in households where at least one parent is dependent on alcohol or has abused alcohol; and there are 88,000 deaths annually from alcohol-related diseases.

Major Personal Risks and Commercial Risks

- **Property Risks**: Persons owning property are exposed to property risks, this is the risk of having property damaged or destroyed from numerous causes. Homes and other real estate and personal property can be damaged or destroyed because of fire, lightning, tornado, windstorm, theft, and numerous other causes.

There are two major types of loss associated with the destruction or theft of property:

- **Direct Loss**: A direct loss is defined as a financial loss that results from the physical damage, destruction, or theft of the property. For example, if you own a house that is damaged or destroyed by a fire, the physical damage to the house is a direct loss.

- **Indirect or Consequential Loss**: An indirect loss is a financial loss that results indirectly from the occurrence of a direct physical damage or theft loss. For example, as a result of the fire to a house, additional living expenses to maintain the normal standard of living may be incurred. You may have to get a motel room or rent an apartment while the home is being repaired, eat from restaurant etc.

Major Personal Risks and Commercial Risks

- **Liability risks:** These are another important type of pure risk that most persons face. Legally, you can be held liable if you do something that results in bodily injury or property damage to someone else. A court of law may order you to pay substantial damages to the person you have injured.

Dog owners can be held liable if their dog bites someone; operators of boats can be held legally liable because of bodily injury to boat occupants, swimmers, and water skiers. Likewise, if you are a physician, attorney, accountant, or other professional, you can be sued by patients and clients because of alleged acts of malpractice. Finally, business firms can be sued for defective products or services that result in bodily injury, property damage, and other harm to users of the product or service.

Liability risks are of great importance for several reasons. First, there is no maximum upper limit with respect to the amount of the loss. You can be sued for any amount. Second, a lien can be placed on your income and financial assets to satisfy a legal judgment. And Finally, legal defense costs can be enormous.

Major Personal Risks and Commercial Risks

❖ **Commercial Risks**: Business firms also face a wide variety of pure risks that can financially cripple or bankrupt the firm if a loss occurs. These also risks include property risks, liability risks, loss of business income, cybersecurity and identity theft, and other risks.

➢ **Loss of Business Income**: Another important risk is the potential loss of business income when a covered physical damage loss occurs. The firm may be shut down for several months because of a physical damage loss to business property due to a fire, tornado, hurricane, earthquake, or another peril. During the shutdown period, the firm would lose business income, which includes the loss of profits, the loss of rents if business property is rented to others, and the loss of local markets.

Fixed costs and continuing expenses that are not offset by revenues can be sizeable if the shutdown period is lengthy. The firm may incur extra expenses during the period of restoration that would not have been incurred if the loss had not taken place. Examples include the cost of relocating temporarily to another location.

Major Personal Risks and Commercial Risks

- **Cybersecurity and Identity Theft**: Cybersecurity and identity theft by thieves breaking into a firm's computer system and database are major problems for many firms today. Computer hackers have been able to steal hundreds of thousands of consumers credit records, which have exposed individuals to identity theft and violation of privacy. As a result, commercial banks, financial institutions, and other business firms are exposed to enormous legal liabilities.

- **Other Risks Business** : firms must cope with a wide variety of additional risks, summarized as follows;

  - **Human resources exposures**. These include job related injuries and disease of workers; death or disability of key employees; group life and health and retirement plan exposures; and violation of federal and state laws and regulations.

  - **Foreign loss exposures**. These include acts of terrorism, political risks, kidnapping of key personnel, damage to foreign plants and property, and foreign currency risks.

  - **Intangible property exposures**. These include damage to the market reputation and public image of the company, the loss of goodwill, and loss of intellectual property.

  - **Government exposures**. Federal and state governments may pass laws and regulations that have a significant financial impact on the company.

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