CHAPTER ONE

THE CONCEPT OF RISK

Introduction

In the present day context, individuals have a strong desire for financial security and protection against those events that threaten their financial security. Financial security can be threatened by numerous factors such as; If the family head is killed in an accident, Destruction of property by fire, floods, earth quakes and other natural factors. Infected by serious diseases such as AIDS, Cancer, Heart disease, etc

Objectives of the Chapter

After completing this unit, students will be able to:

- Define and understand the concept of risk
- Understand the difference between risk, uncertainty and probability
- Understand the word hazard and peril and its relationship with risk

Identify the different types of risk

1.1. Definition of Risk

There is no single definition of risk. Different disciplines were defining risk on the bases of perspective tendency and working condition of the subject matter.

Example 1: **From financial point of view**, risk is defined as uncertainty to the occurrence of financial deficit/loss.

From Economic point of view, risk can be defined as a sudden occurrence of individual/group economic crises. Generally, Economists, behavioral scientists, risk theorists, statisticians, and Actuaries each have their own concept of risk. Some of these definitions are forwarded for your consideration.

- Risk is the possibility of an unfortunate occurrence.
- Risk is a combination of hazards.
- Risk is unpredictability – the tendency that actual results may differ from predicted results.
- Risk is uncertainty of loss.
- Risk is the possibility loss.

Example 2: the following are some the basic examples of risks which can result to uncertain able losses.

- The risk of being killed in auto accident
- The risk of house damage as a result of flooding or earth quick.
- The risk of car collision in ice road

Generally, Risk can be defined as: “a condition in which there is a possibility of an adverse deviation between a desired/expected out come from an actual one”. On the other hand, it is the identification, measurement, and treatment of exposures to potential losses.

1.2. Risk Vs Uncertainty

Many textbooks use the terms risk and uncertainty interchangeably. However, the distinction between the two must be noted. The "risk versus uncertainty" debate is long-running and far from resolved at present. Although the two are closely related, quite many authors make a distinction between the two terms. Uncertainty refers to the doubt as to the occurrence of a certain desired outcome. It is more of subjective belief. Subjective in a sense that it is based on the knowledge and attitudes of the person viewing the situation and as the result different subjective uncertainties are possible for different individuals under identical circumstances of the external world.

Knight defined "risk" as a measurable uncertainty that can be determined by objective analysis based on prior experience and "uncertainty" as unmeasurable uncertainty that is of a more subjective nature because it is without precedent. Risk is dealt with every day by weighing probabilities and surveying options, but uncertainty can be debilitating, even paralyzing, because so much is new and unknown. The practical difference between the two categories, risk and uncertainty, is that in the risk the distribution of the outcome in a group of instances is known either through calculation a priori or from statistics of past experience; while in the case of uncertainty this is not true, the reason being in general that it is impossible to form a group of instances, because the situation dealt with is in a high degree unique. Prefer has noted the difference between risk and uncertainty as "Risk is a combination of hazards and is measured by probability; uncertainty is measured by the degree of belief. Risk is a **state of the world**; uncertainty is a state of the mind."

In general, many authors indicated that risk is objective phenomenon that can be measured mathematically or statistically. It is independent of the individual's belief. Whereas, uncertainty is subjective that cannot be measured objectively. Of course, risk and uncertainty may have some relationship. Uncertainty results from the imperfection of knowledge of mankind of predicting the future. The higher the lack of knowledge about the future the higher the uncertainty. But, it is debatable to say that higher uncertainty leads to higher risk. The presence and absence of uncertain does not necessarily mean the presence and absence of risk respectively. The following four situations underscore the difference between risk and uncertainty:

1. Both risk and uncertainty are present

eg. a person may be exposed to risk of disability and may experience uncertainty

2. Both risk and uncertainty are absent

eg. sailors at present know that the earth is not flat.

There is no possibility of falling off the edge of the earth.

3. Risk is present and uncertainty absent

eg. the possibility of loss due to interruption of operation by fire.
There may be no uncertainty because of failure to recognize the existence of such risk, understatement of the situation or because of preoccupation with other problems.

4. Risk absent but uncertainty present

eg. An hour ago, a man heard that a plane departing from the airport crashed. The man knows that his wife was scheduled to fly from the airport earlier today, but he does not know whether she was on the plane crashed. Here there is no risk as risk refers to future outcomes. However, there is uncertainty since it relates to past, present and future situations.
Hence, from the discussions above it is clear that risk is primarily objective while uncertainty relates to the **subjective state of mind.** Moreover, there may not be any necessary relationship between risk and uncertainty Risk exists whether or not a person is aware of it. It is a **state of the world**. Uncertainty, however, exists only with awareness; it is a state of mind. For example, the risk of cancer from cigarette smoking existed the moment cigarettes are produced. However, the uncertainty did not arise until the relationship between cigarette smoking and cancer is established through scientific and empirical research.
Generally, it is possible to conclude that although there is relationship between risk and uncertainty, they are different practically.

1.3. Risk & Probability

It is necessary to distinguish carefully between risk and probability. Probability refers to the long-run chance of occurrence, or relative frequency of some event. Risk, as differentiated from probability, is a concept in relative variation. We are referring here particularly to objective risk.
The probability associated with a certain outcome is the relative likelihood that outcome will occur. And probability varies between 0 and 1. If the probability is 0, that outcome will not occur, if the probability is 1, that outcome will occur
Probabilities are generally assigned to events that are expected to happen in the future. There may be a number of possible events that will take place under given set of conditions; and these events may occur in equal or different chance of occurrence. The weights given to each possible event may depend on prior knowledge, past experience, statistical or mathematical estimation of relevant data or psychological belief. Thus, to each possible event is assigned a corresponding probability of occurrence that leads to probability distribution. This means that probability relates to a single possible event.

Risk on the other hand refers to the variation in the possible outcomes. This means that risk depends on the entire probability distribution. It indicates the concept of variability. Therefore, the concepts of risk and probability are two different things.

The following example illustrates the distinction between risk and probability. Suppose the occurrence of a particular event is to be considered. One extreme is that this event is certainly to take place. Thus, the probability that this event will take place is 1. There is certainty as to the occurrence of this event with prefect foresight in this regard. Accordingly, there is no risk. The other extreme is that the event will not take place at all. Hence, the probability of occurrence is zero. Here, too, there is certainty and therefore, there is no risk. In between these two extremes there could be several occurrences of the events with the corresponding probabilities of occurrence. It is therefore; risk and probability are different but related concepts.

1.4. Risk, peril and hazard

The concepts of risk have already been defined above. Two concepts, peril and hazard must be distinguished from risk. Although, the three concepts have one common feature in transmitting bad taste or feeling, they are differentiated as follows:

Peril: - refers to the specific cause of a loss. For example, fire, windstorm, theft, explosion, flood etc. therefore, the source or cause of a loss is called a peril.

Hazard: - refers to the condition that may create or increase the chance of a loss arising from a given peril. Hazard affects the magnitude and frequency of a loss. The more hazardous conditions are, the higher the chance of loss. There are three categories of hazards:

1. Physical Hazard: - This is associated with the physical properties of the item exposed to risk. Examples of physical hazard include the following:

- ✓ type of construction material such as wood, bricks, etc
- ✓ location of property such as near to fuel station, near to flood area, near to earthquake area, etc.
- ✓ occupancy of building such as dry cleaning, chemicals, supermarket etc.
- ✓ working condition such as machines for personal accidents. etc.

2. **Moral Hazard: -** This originates from evil tendencies in the character of the insured person. It is associated with human nature, qualities, reputation, attitude, etc.
   examples include the following:
   - ✓ dishonesty, fraudulent intention, exaggeration of claims, etc …

3. **Morale Hazard: -** This originates from acts of carelessness leading to the occurrence of a loss. It occurs due to lack of concern for events. Examples are:

- ✓ poor housekeeping in stores

- ✓ cigarette smoking around petrol sations.

etc.

In some situations, however, it is difficult to distinguish between a peril and a hazard. For example, a fire in general may be regarded as a peril concerning the loss of physical property. It may also be regarded as a hazard concerning auto collisions created by the confusion in the vicinity of the fire (around the fire).

1.5. Classification of Risks

We turn our attention now to the classes into which risk can be placed, this is different from scrutinizing the actual idea of risk; we are now looking at the whole concept of risk and grouping together similar classes of risk. Of the many classes, we will look at five.

1. **Objective and Subjective Risk**

Objective risk- is defined as the relative variation of the actual loss from expected loss. For example, assume that a fire insurer has 10,000 houses insured over a long period and, on average, 1 percent, or 100 houses burn each year. In some years as few as 90 houses may burn, while in other years, as many as 110 houses may burn. Thus, there is a variation of 10 houses from the expected number of 100, or a variation of 10 percent. This relative variation of actual loss from expected loss is known as objective risk.

Subjective risk – is defined as uncertainty based on a person's men talk condition or state of mind. For example, an individual is drinking heavily in a bar and attempts to drive home. The driver may be uncertain whether he or she will arrive home sagely without being arrested by the police for drunk driving. This mental uncertainty is called subjective risk. Often subjective risk is expressed in terms of the degree of belief.

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

2. **Financial and Non-Financial Risk**

Financial risks: -is one where the outcome can be measured in monetary terms. It is the risks that out comes will cause financial losses.

Example: -

- Material damage to the property
- Theft of property
- Loss of Business profit following fire

Non-Financial Risk: -is a risk that doesn't have a financial implication or their outcome is not directly measurable financially but by other, like psychological or mental effect the risk may create.

Example **:** - Moral failure because of bulling boss

: - Risk of selecting a marriage partner

3. Pure and speculative Risks

I) **Pure Risk:** is 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, etc.

Types of Pure Risk:

The following are the important types of pure risks;

i) Personal risks

ii) Property risks

iii) Liability risks

Classification of pure risks

A. Personal Risks – are risks that directly affect an individual; they involve the possibility of the complete loss or reduction of earned income, extra expenses, and the depletion of financial assets. In other words, they refer to the possibility of loss to a person such as: death, disability, loss of earning power etc. there are four major personal risks.

a) Risk of premature death
b) Risk of old age
c) Risk of poor health –
d) Risk of unemployment

B. Property Risk This refers to losses associated with ownership of property. Persons owning property are exposed to the risk of having their property damaged or lost from numerous causes. Property risk stems from diverse perils accompanied by different hazards: physical, moral. Real estate and personal property can be damaged or destroyed because of fire, lightening, tornadoes, windstorms, and numerous other causes.

There are two major types of loss in the damage of property;

- A ***direct loss*** is defined as a financial loss that results directly from the physical damage, destruction, or theft of the property. For example, if a factory is damaged by a fire, the physical damage to that is known as direct loss.
- An ***indirect loss*** is a financial loss that results indirectly from the occurrence of a direct physical damage or theft loss. It is also known as consequential loss.

C. Liability Risk

Liability risk is the possibility of loss arising from intentional or unintentional damage made to other persons or to their property. **is** another type of pure risk that most persons face? One can be made legally liable, if he or she do something that result in bodily injury or property damage to someone else. The court of law may order that person to pay substantial damages to the person who is injured.

Motorists are being held legally liable for the negligent operation of their vehicles. Producers are also being sued because of defective products that harm or injure customers

.**II/ Speculative Risk**

The alternative to pure risks is speculative risk, where there are two possible outcomes –gain or loss. Is a situation in which either profit or loss is possible?

For example, if Mr.X purchases 100 shares of ABC Company, he would gain if the price of that share price increases but he would lose if the price declines. Thus, here there are possibilities of both profit and loss.

Speculative risk can be differentiated from the **pure risk** in three ways;

(i) Private insurers generally insure only pure risks. Speculative risks are not considered insurable and other techniques must have used to cope with risk.

(ii) 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 loss in advance. But, it cannot be applied to speculative risks in order to predict future loss experience

(iii) Society may benefit from a speculative risk even though a loss occurs, but it is harmed if a pure risk is present and loss occurs. For example, a firm may develop new technology for producing cheaply. As a result, some competitors may fail.

4. Static and Dynamic Risks

- **Dynamic risks** are those resulting from changes in the economy such as changes in the price level, consumer tests, income and output and technology may cause financial loss to members of the economy.
- **Static risk**-it involves those losses that would occur even if there were no changes in the economy. These losses arise from causes other than the changes in the economy such as the perils of nature.

5. Fundamental and particular Risks

A fundamental risk is a risk that affects the entire economy or large number of persons or groups within the economy. Examples include high inflation, cyclical unemployment & war.

The risk of a natural disaster is another important fundamental risk. Tornadoes, earthquakes, floods and forest fires can result in property damage as well as the loss of numerous lives.

A particular risk is a risk that affects only individuals and not the entire community. Examples are car thefts, bank robberies, etc. Here, only individuals experiencing such losses are affected, not the entire economy.

The distinction between a fundamental and particular risk is important since government assistance may be necessary to insure a fundamental risk.

Social insurance and government insurance programs, as well as government guarantees and subsidies,

1.6. Risks related to business activities

Most risks in business environment are speculative in nature. The finance literature considers five types of risks that business organizations face in the course of their normal operation: business risk, financial risk, interest rate risk, purchasing power risk, and market risk.

1. **Business Risk: -** This the risk associated with the physical operation of the firm. Variations in the level of sales, costs, profits, are likely to occur due to a number of factors inherent in the economic environment. Business risk is independent of the company's financial structure.

2. **Financial Risk: -** This is associated with debt financing. Borrowing results in the payment of periodic interest charge and the payment of the principal upon maturity. There is a risk of default by the company if operations are not profitable. Other financial risks include: bankruptcy, stock price decline, insolvency, etc. Bond holders are less exposed to financial risk than common stock holders because they have a priority claim against the assets of an insolvent firm.

3. **Interest Rate Risk: -** This is a risk resulting from changes in interest rates. Changes in interest rates affect the price of financial securities such as the price of bonds, stock, etc---

4. **Purchasing power Risk: -** This risk arises under inflationary situations (general price rise of goods and services) leading to a decline in the purchasing power of the asset held. Financial assets lose purchasing power if increased inflationary tendencies prevail in the economy.

5. **Market Risk: -** Market risk is related to stock market. It refers to stock price variability caused by market forces. It is the result of investors reactions to real or psychological expectations. The market in many cases, is also affected by such events like presidential election, trade balances, wars, new inventories, etc. market risk is also called systematic or non-diversifiable risk. All investors are subject to this risk. It is the result of the workings of the economy; and cannot be eliminated through portfolio diversification.