# ASSESSMENT OF RISK

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# LEARNING OUTCOMES

1. To understand the definition of risk and uncertainty
2. To know various types of risk
3. To understand the various ways of treating risk
4. To solve some calculation on risk evaluation

# Definition of a risk

- Risk can be defined as the situation in which the future outcome is unknown but the likelihood of its occurrence can be estimated or determined. In other word, the probability of future occurrence can be estimated

# Definition of a uncertainty

Uncertainty can be defined as the situation in which the future outcome is unknown and the likelihood of its occurrence cannot be estimated or determined. In other word, the probability of future occurrence cannot be estimated

# TYPES OF RISK

1. Business Risk: this is the risk that concerned with the future uncertainty about a company operating prospect
2. Financial Risk: this is the risk that concerned with the introduction of debt into a company capital structure

3. Economic Risk: this is the risk that concerned with the amount of risk an organization is at due to shifts in macroeconomic variables or forces

# TYPES OF RISK

4. Interest rate Risk: this is the risk that concerned with the exposure of a bank current or future earnings and capital to adverse changes in market rates

5. Market Rik: this is the risk that concerned with the potential for losses arising from factors influencing the overall performance of financial markets

# TYPES OF RISK

6. Liquidity risk: this is the risk of loss resulting from the inability to meet payment obligations in full and on time when they become due

# HOW TO TREAT RISK

1. PROBABILITY METHOD
2 NON PROBABILITY METHOD

# PROBABILITY METHOD

1. Expected return or means or expected value
2. Variance
3. Standard deviation
4. Coefficient of variation

# PROBABILITY METHOD

NOTE

1. The higher the variance, standard deviation and coefficient of variation, the higher the risk in such security and vice versa.
2. For a risk averse investor, he/she will select security with the lowest risk or variance or standard deviation or coefficient of variation
3. For a risk taker investor, he/she will select security with the highest risk or variance or standard deviation or coefficient of variation

# NON-PROBABILITY METHOD

1. Sensitivity analysis
2. Payback Period
3. Risk adjusted method
4. Certainty equivalent factor
5. Simulation

# ILLUSTRATION

- James is considering investment in the following securities whose random returns are given as follows:

| SECURITY A | | SECURITY B | |
|---|---|---|---|
| Return | Probability | Return | Probability |
| N4,000 | 0.4 | N6,000 | 0.7 |
| N5,000 | 0.5 | N4,000 | 0.2 |
| N6,000 | 0.1 | N3,000 | 0.1 |

# ILLUSTRATION CONTINUE

REQUIRED

a. Calculate the i. Expected return

ii. Variance

iii. Standard deviation

iv. Coefficient of variation of each security

b. Which security would you recommend to James, who is a risk averse investor? Why?

# SOLUTION FOR PROJECT A

| RETURN | PROBABILITY | VALUE | Ri - ER | Prob $(Ri - ER)^2$ |
|---|---|---|---|---|
| N4,000 | 0.4 | 1,600 | -700 | 196,000 |
| N5,000 | 0.5 | 2,500 | 300 | 45,000 |
| N6,000 | 0.1 | 600 | 1,300 | 169,000 |
| | | ER = 4,700 | | Variance = 410,000 |

# SOLUTION FOR PROJECT A CONTINUE

- EXPECTED RETURN FOR PROJECT A = N4,700
- VARIANCE FOR PROJECT A = N410,000
- STANDARD DEVIATION FOR PROJECT A = SQUARE ROOT OF VARIANCE OF PROJECT A = N640
- COEFFICIENT OF VARIATION FOR PROJECT A = $\frac{SD}{ER} \times 100$
- $= \frac{640}{4,700} \times 100$
- $= 14\%$

# SOLUTION FOR PROJECT B

| RETURN | PROBABILITY | VALUE | Ri - ER | Prob $(Ri - ER)^2$ |
|---|---|---|---|---|
| N6,000 | 0.7 | 4,200 | 700 | 343,000 |
| N4,000 | 0.2 | 800 | -1,300 | 338,000 |
| N3,000 | 0.1 | 300 | -2,300 | 529,000 |
| | | ER = 5,300 | | Variance =1,210,000 |

# SOLUTION FOR PROJECT B CONTINUE

- EXPECTED RETURN FOR PROJECT B = N5,300
- VARIANCE FOR PROJECT B = N1,210,000
- STANDARD DEVIATION FOR PROJECT B = SQUARE ROOT OF VARIANCE OF PROJECT B
- = N1,100
- COEFFICIENT OF VARIATION FOR PROJECT B = $\frac{SD}{ER} \times 100$
- = $\frac{1,100}{5,300} \times 100$
- = 21%

# SOLUTION CONTINUE

I will recommend security A, because its variance, standard deviation, coefficient of variation is lower than that of security B. (Its has the lower risk)

# ASSIGNMENT

EXAMPLE: Willy is considering the two securities as stated below

| SECURITY X | | SECURITY Y | |
|---|---|---|---|
| RETURN | PROBABILITY | RETURN | PROBABILITY |
| N5,000 | 0.1 | N8,000 | 0.2 |
| N6,000 | 0.3 | N7,000 | 0.4 |
| N7,000 | 0.6 | N6,000 | 0.4 |

# ASSIGNMENT CONTINUE

REQUIRED

a. Calculate the i. Expected return

ii. Variance

iii. Standard deviation

iv. Coefficient of variation of each security

b. Which security would you recommend to Willy, who is a risk taker investor? Why?

# PRACTICE QUESTIONS

PROBLEMS AND SOLUTION ON FINANCIAL MANAGEMENT BY DR SHIRO ABASS , CHAPTER FIVE, QUESTIONS 1,2, 12 and 13. THE TEXTBOOK IS AVAILABLE IN UNILAG BOOKSHOP