

F010403T

# Investment Analysis & Portfolio Management

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# Syllabus

Unit	Topics	No. of Lectures Total=30
I	Investments: Nature, scope, objective and Process of investments analysis, concept of return and risk analysis, measurement of return and risk: Systematic and Unsystematic Risk.	8
II	Investment Alternatives: Investment instrument of Capital Market and Money Market, Valuation of Fixed and Variable securities Non Security forms of Investment, Government Securities, Mutual Fund, Real Estate and Gold.	7
III	Fundamental Analysis: Economic analysis industry analysis and company analysis Technical Analysis: Trends, indicators, indices and moving average applied in technical analysis. Efficient Market Hypothesis: weak, semi-strong and strong market and its testing techniques	8
IV	Portfolio Management: Meaning, importance and objectives of portfolio and portfolio management, Risk and Return- Definition types and importance. Portfolio Analysis: Risk Measurement; Estimating rate of return and standard deviation of portfolio returns; Effects of Combining securities;	7
Suggested Readings: 1. Security analysis and Portfolio Management by Punithavathy Pandian		

## REFERENCES:

1. Barua, Raghunathan and Verma: portfolio management, Tata McGraw Hill, New Delhi
2. Clark, James Francis: Investment- Analysis and Management, McGraw Hill, International Edition, New York.
3. Fabozzi, Frank J: Investment Management, Prentice Hall, International Edition, New York.
4. Fischer, D.E and Jordan R.J: Security Analysis and Portfolio Management, Prentice Hall, New Delhi.
5. Sharpe, Willim F, Gordon J Alexander and J.V Baily: Investments, Prentice Hall, New Delhi.
6. Strong, Robert: Portfolio Construction: Management and Protection, West Publishing Co.
7. Sharpe, Willim F: Portfolio Theory and Capital Markets, Mc Graw Hill, New York.
8. Elton Edwin J, Gumber Martin J: Morden Portfolio Theory and Investment Analysis; John Wiley, New York.

# Savings

- Putting aside a part of your earnings over time.
- The saved amount of money is subject to no risk and, therefore, does not help you earn any profits or returns.

# Investment

- An investment is the current commitment of dollars for a period of time in order to derive future payments that will compensate the investor for
  - (1) the time the funds are committed,
  - (2) the expected rate of inflation, and
  - (3) the uncertainty of the future payments.
- The “investor” can be an individual, a government, a pension fund, or a corporation. Similarly, this definition includes all types of investments, including investments by corporations in plant and equipment and investments by individuals in stocks, bonds, commodities, or real estate.

# Elements

- **Return:** The prime objective of any type of investment is to drive return. The expected return may be regular income (interest dividend, rent etc) or increase in the value of investment/capital appreciation, i.e. difference between the selling price and buying price of assets. The nature of investment (risky, less risky, non risky) is the deciding factor of required return from it.
- **Risk:** Risk is the basic attribute of investment. Risk means variability in return . More the risk more is the expected return and vice versa.
- **Safety:** Safety rule of investment states that investors get back their original principal on maturity with no loss in value and hindrance.
- **Liquidity:** It means an investor can sell his investment in market as need arise without incurring much transaction costs, less energy and time.

# Characteristics of Investment

- Safety of principal (e.g. gilt edged securities)
- Liquidity (e.g. CPs and CDs)
- Income stability (e.g. Debentures)
- Capital appreciation (e.g. equity)
- Tangibility (e.g. land and buildings)
- Tax Benefit

# Objectives of Investment

- The main objective of an investment is to minimize risk while simultaneously maximizing the expected returns from the investment and assuring safety and liquidity of the invested assets



# Objectives of Investment

- Beat Inflation
- To Keep Money Safe
- To Help Money Grow
- To Earn a Steady Stream of Income
- To Minimize the Burden of Tax
- To Save up for Retirement
- To Meet your Financial Goals

# Types of Investment

- Financial
- Economic

# Financial investment

- Financial Investments are the allocation of monetary resources ranging from risk-free to risky investments and with the expectation of a good return that varies with risk. The investor has to aim at a trade-off between risk and return.
- In the financial sense, investment is the commitment of funds to derive future income in the form of interest, dividend, premium, pension benefits, or appreciation in the value of the initial investment.

# Economic Investment

- The economist understands the term 'Investment' as net additions to the economy's capital stock which consists of goods and services that are used in the production of other goods and services

# Different investments Options

- Stocks
- Certificate of Deposit
- Bonds
- Real Estate
- Fixed Deposits
- Mutual Funds
- Public Provident Fund (PPF)
- National Pension System (NPS)
- Unit Linked Insurance Plan (ULIP)
- Senior Citizens' Savings Scheme

# Investment Analysis

- Investment analysis is the process of evaluating and assessing the potential returns and risks associated with an investment opportunity. It involves analyzing various aspects of an investment such as the Liquidity, the company, the industry, the economy, and the financial statements to make informed investment decisions.

# Process of Investment Analysis

- Establish goals (Long Vs Short term )
- Assess and manage risk
- Select investments (based on your Risk and Return Profile)
- Monitor progress
- Maximize returns

# RETURN

- Return on a financial asset, generally, consists of two components. The principal component of return is the periodic income on the investment, either in the form of interest or dividends.
- The second component is the change in the price of the asset—commonly called the capital gain or loss.
- This element of return is the difference between the purchase price and the price at which the asset can be or is sold. The price change may bring a gain or a loss as it may be in any side.



# Holding Period

- A holding period is the time period for which the investor holds on to the asset or immovable property. It is also calculated as the time between the purchase and sale of a security.
- In other words, a holding period is the amount of time the investment is held by an investor, or the period between the purchase and sale of an asset or a security.

# Holding Period Return

$$\text{Holding Period Return (HPR)} = \frac{((\text{Ending Value} - \text{Beginning Value}) + \text{Income})}{\text{Beginning Value}}$$

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# Risk

- Risk is the uncertainty that an investment will earn its expected rate of return.

$$\text{Expected Return} = \sum_{i=1}^n (\text{Probability of Return}) \times (\text{Possible Return})$$

$$E(R_i) = [(P_1)(R_1) + (P_2)(R_2) + (P_3)(R_3) + \cdots + (P_n R_n)]$$

$$E(R_i) = \sum_{i=1}^n (P_i)(R_i)$$

# RISK

- Risk is the probability of getting return. It is measured in terms of deviation between actual return and expected return.
- Return is the outcome of an investment.
- All investment assets have some amount or type of risk associated with them. Even the bank fixed deposits perceived to not having any risk, do actually bear the risk of real returns becoming negative due to high inflation.!!

# Risk Vs. Uncertainty

- Risk is different from uncertainty. In risk, the outcomes or the expected deviations to the outcomes are known before-hand. However, uncertainty involves a situation where the outcome is not known.

# Types of Risk

## Systematic/ Market Risk

- *The systematic risk is the risk arising due to the external and uncontrollable factors associated with the inherent nature of the security, the financial markets, the industry trends, and the state of the economies of a region or world.*
- Systematic risk is usually the risk inherent to the entire market or market segment. Hence, this risk affects the entire market / industry and not a particular business.
- This risk occurs due to the influence of external factors on an organization. Such factors are normally uncontrollable from an organization's point of view. These risks can hence not be controlled or managed by a specific organization.



# Examples

1. **Market Risk** – arises due to changes in market conditions, mainly the change in demand and supply forces in the market as well as unforeseen changes in investor perception and subjective factors which are uncontrollable by a single firm.
2. **Interest Rate Risk** – arises due to changes in interest rate, mainly on account of the changes in monetary and credit policies which cannot be controlled by specific/individual firms. A change (increase) in the interest rate can possibly result in an increase in the cash outflow for a firm to service the debt taken by it.
3. **Inflation or Purchasing Power Risk** – Inflation causes the production costs to rise, as it reduces the purchasing power of the firm to purchase the production inputs. Inflation ultimately results in reducing the overall profits for a firm.
4. **Risks pertaining to trade cycles or business conditions** – are also associated with the macro economic scenario in a country/region & hence beyond the control of an individual firm.

## Unsystematic/Diversifiable Risk

- The type of risks that emerge out of **known and controllable factors**, **internal to the concerned organization** or the issuer of the investment security.
- Unsystematic risk occurs due to the influence of internal factors prevailing within an organization. Such factors are normally controllable from an organization's point of view.

## Examples of Unsystematic Risk

- (i) Business risk: Business risk relates to the variability of the sales, income, profits etc., which in turn depend on the market conditions for the product mix, input supplies, strength of competitors, etc. The business risk is sometimes external to the company due to changes in government policy or strategies of competitors or unforeseen market conditions.

They may be internal due to **fall in production, labour problems, raw material problems or inadequate supply of electricity** etc. The internal business risk leads to fall in revenues and in profit of the company, but can be corrected by certain changes in the company's policies.

# Examples of Unsystematic Risk

(ii) Financial Risk: Debt Equity Financing

# Examples of Unsystematic Risk

R&D failures

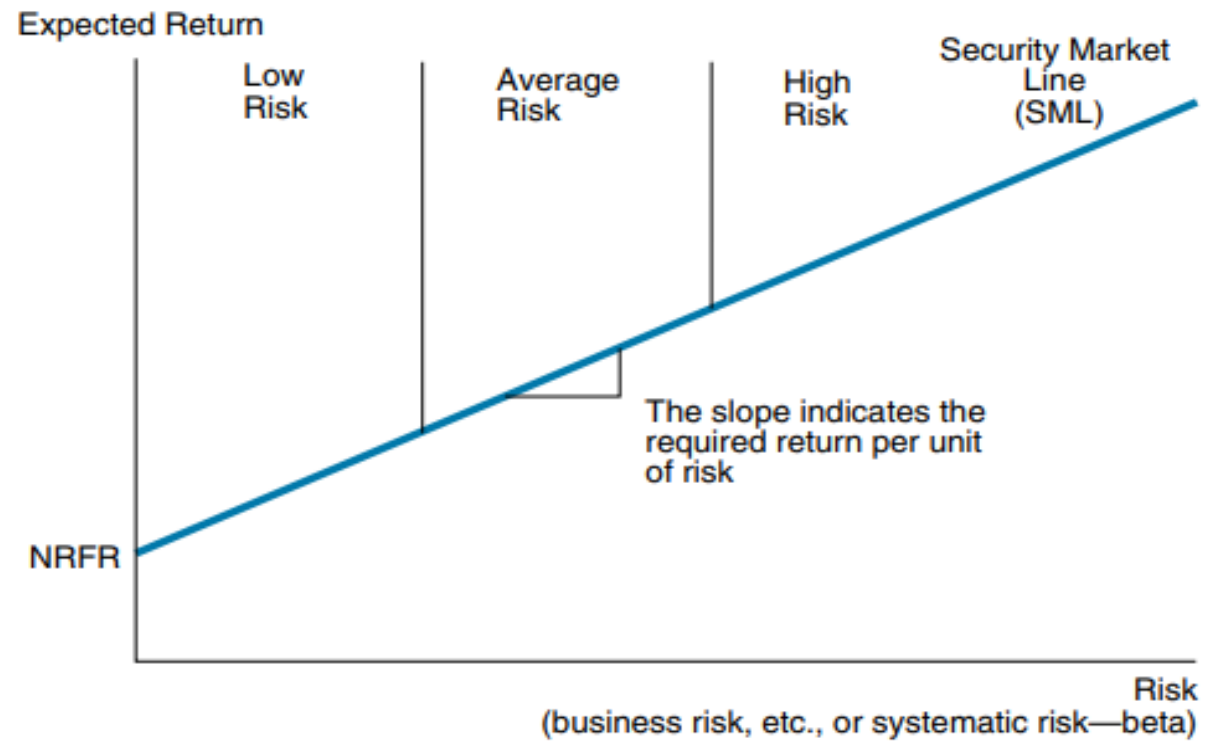
Unsuccessful marketing

Losing major contracts

# Risk and Return Relationship

- It shows that investors increase their required rates of return as perceived risk (uncertainty) increases. The line that reflects the combination of risk and return available on alternative investments is referred to as the security market line (SML).
- The SML reflects the risk-return combinations available for all risky assets in the capital market at a given time. Investors would select investments that are consistent with their risk preferences; some would consider only low-risk investments, whereas others welcome high-risk investments.

*RELATIONSHIP BETWEEN RISK AND RETURN*



# Standard deviation

- denoted by the Greek alphabet  $\sigma$
- suggested by Karl Pearson as a measure of dispersion in 1893.
  - It is defined as the positive square root of the mean of the square of the deviations of the given observations from their arithmetic mean. If  $X_1, X_2, \dots, X_n$  is a set of  $n$  observations then its standard deviation is given by :

$$\sigma = \sqrt{\frac{1}{n} \sum_{i=1}^n (X_i - \bar{X})^2} \text{ where } \bar{X} = \frac{\sum_{i=1}^n X_i}{n}$$



# Standard Deviation

- ▶ *An equity stock that has a high standard deviation can be expected to have highly volatile returns (with high risks)*
- ▶ Higher the standard deviation, higher is the expected volatility and hence a higher level of risk associated with the stock.

Question : Calculate Standard Deviation (S.D.) from the following set of observations:

<b>X</b>	10	11	17	25	7
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Answer

<b>X</b>	$X - \bar{X}$	$(X - \bar{X})^2$
10	-4	16
11	-3	9
17	3	9
25	11	121
7	-7	49
Sum X = 70		Sum = 204

$$\text{Standard Deviation} = \sqrt{204/5} = 6.38$$

# Measurement of Risk – Covariance

- ▶ is the statistical measure of the directional relationship between the returns of two or more investments or different assets.
- ▶ In finance, **Covariance is a measure of the degree to which returns on two investment assets move in tandem.** A positive covariance means that asset returns move together, while a negative covariance means that the returns move inversely or in the opposite direction.
- ▶ When two security prices tend to move together, they are seen as having a positive covariance; when they move inversely, the covariance is negative.



## Covariance- Importance and Applicability

- **Diversification of investments:** To diversify investments in nonrelated asset classes (to enjoy diversified earnings or just reduce the investment risks), the investors need to invest in securities/assets that have a very low covariance amongst themselves.

## Covariance- Importance and Applicability

- **A hedging component:** By enabling an investment in assets whose returns have negative covariance. This way, the negative returns in one investment asset will get compensated (even if to some extent) by the positive return in another investment asset.

# Covariance

$$\text{Cov}(X, Y) = \frac{\sum (X - \bar{X})(Y - \bar{Y})}{N}$$

<b>X</b>	<b>Y</b>	$\overline{X - X}$	$\overline{Y - Y}$	$\overline{(X - X)(Y - Y)}$
1	9	-4	-3	12
3	10	-2	-2	4
5	11	0	-1	0
7	14	2	2	4
9	15	4	1	4
2	8	-3	-4	12
4	12	-1	0	-1
6	13	1	1	1
8	16	3	4	12
<b>45</b>	<b>108</b>	<b>0</b>	<b>0</b>	$\Sigma(X - X)(Y - Y) =$ <b>48</b>

Mean X = 5, Mean Y = 12



$$\text{Cov}(X, Y) = \frac{\sum (X - \bar{X})(Y - \bar{Y})}{N}$$

$$= 48/9 = 5.33$$

# Karl Pearson Coefficient of Correlation

- Karl Pearson, the great biologist and statistician has given a formula for the calculation of coefficient of correlation. According to it the *coefficient of correlation of two variables is obtained by the, products of the corresponding deviations of the various items of two series from their respective means by the product of their standard deviations and the number of pairs of observations.*
- Karl Pearson's measure, known as Correlation Coefficient between two variables  $X$  and  $Y$ , *usually denoted by  $r(X,Y)$  or  $r_{xy}$  or simply  $r$  is a numerical measure of linear relationship between them and is defined as the ratio of the covariance between  $X$  and  $Y$ , to the product of the standard deviations of  $X$  and  $Y$ .*

$$r_{xy} = \frac{\text{Cov}(X, Y)}{S_x \cdot S_y}$$

## Karl Pearson Coefficient of Correlation by Actual Mean Method

$$r = \frac{\sum(x-\bar{x})(y-\bar{y})}{\sqrt{\sum(x-\bar{x})^2} \sqrt{\sum(y-\bar{y})^2}}$$

Where,  $\bar{x}$  = mean of X variable  
 $\bar{y}$  = mean of Y variable

## Beta – As a Measure of Risk

- Beta is a measure of a stock's volatility in relation to the market.
- the sensitivity of an asset's price compared to a specific index or benchmark.
- The market has a beta of 1.0, and individual stocks are ranked according to how much they deviate from the market.

## Beta coefficient formula

$$\text{Beta coefficient } (\beta) = \frac{\text{Covariance } (R_e, R_m)}{\text{Variance } (R_m)}$$

$R_e$  = the return on an individual stock

$R_m$  = the return on the overall market

**Covariance** = how changes in a stock's returns are related to changes in the market's returns

**Variance** = how far the market's data points spread out from their average value

# Beta – A Measure of Risk & Return

$\beta = 1$  exactly as volatile as the market (index fund offered by Mutual fund)

$\beta > 1$  more volatile than the market (Small Cap fund)

$\beta$  between 0 and 1 less volatile than the market (utility stocks)

$\beta = 0$  uncorrelated to the market (cash)

$\beta < 0$  negatively correlated to the market

