BALAJI INSTITUTE OF I.T AND MANAGEMENT KADAPA

INVESTMENT & PORTFOLIO MANAGEMENT

(21E00305a)

ICET CODE: BIMK

www.bimkadapa.in

1st & 2nd INTERNAL EXAM

Name of the Faculty: T.HIMMAT

Units covered: **1-5 Units**

Email ID: himmatbimk@gmail.com

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR
(Established by Govt. of A.P., ACT No.30 of 2008)
ANANTHAPURAMU – 515 002 (A.P) INDIA

MASTER OF BUSINESS ADMINISTRATION
MBA; MBA (General Management); MBA (Business Management)
COMMON COURSE STRUCTURE & SYLLABI

Course Code	**Specialization Elective- III**	**L**	**T**	**P**	**C**
21E00305a	**Investment And Portfolio Management**	**4**	**0**	**0**	**4**
	Semester	**III**			

Course Objectives:

- To present and discuss an overview of stock markets.
- To explain concept of investment, process of investment.
- To discuss framework of fundamental and technical analysis under security analysis
- To impart knowledge on estimation and measurement of risk and return.
- To explain process of valuation of different securities.
- To describe the process of portfolio management process, theories, models to measure the performance of portfolio.

Course Outcomes (CO): Student will be able to

- Understand the overview of stock markets.
- Acquire knowledge on process of investment,
- Analyse the security under different types before investing in stocks.
- Ascertain risk and return value of different securities and portfolio
- Learn various portfolio theories, models to manage portfolio and maximise the portfolio returns.

UNIT – I	Lecture Hrs: 8

Investment: Introduction to stock markets - objectives, Process of Investment, Investment and speculation.

UNIT – II	Lecture Hrs: 12

Fundamental Analysis & Technical Analysis: Framework of Fundamental analysis- Economic analysis, Industry analysis-Industry Life cycle - Company analysis, Fundamental Analysis Vs Technical Analysis - Dow Theory.

UNIT - III	Lecture Hrs:12

Measurement of Risk and Return: Revenue Return and Capital appreciation, holding period – Calculation of expected return, Risk factors, risk classification – systematic risk – unsystematic risk – standard deviation – variance– Beta .

UNIT – IV	Lecture Hrs:12

Valuation of Securities: Types of Securities - Approaches of valuation – Bond valuation – Preference share Valuation – Common stock Valuation

UNIT – V	Lecture Hrs:12

Portfolio Management: Process of Portfolio Management, Modern Portfolio – Portfolio models – Markowitz model – Sharpe single index model, Capital Asset Pricing Models.

Textbooks:

1. Investment Management,V.K.Balla, S.Chand Company Ltd
2. Security Analysis and Portfolio Management ,Punithavathy Pandian, Vikas

Reference Books:

- Investment Analysis and portfolio management, Chandra, Tata McGraw Hill .
- Secuerity Analysis Portfolio Management, Ranganatham & Madhumathi, Pearson Education.
- Security Analysis and Portfolio Management, Sudhindra Bhat, excel.
- Security analysis and portfolio management, Avadani, Himalaya publishers.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR
(Established by Govt. of A.P., ACT No.30 of 2008)
ANANTHAPURAMU – 515 002 (A.P) INDIA

MASTER OF BUSINESS ADMINISTRATION
MBA; MBA (General Management); MBA (Business Management)
COMMON COURSE STRUCTURE

- Investment analysis portfolio management, Frank Reilly & Brown, Cengage.
- Investment Management, Preethi Singh, Himalaya Publishing House, Mumbai..
- Investment, Bodie, McGraw Hill Book Company.
- Investment Management ,Hiriyappa ,New Age Publications

Online Learning Resources:

https://www.bcci.bg/projects/latvia/pdf/8_IAPM_final.pdf
https://backup.pondiuni.edu.in/sites/default/files/investment%26portfolio-260214.pdf
https://sist.sathyabama.ac.in/sist_coursematerial/uploads/SBAA7002.pdf
https://www.youtube.com/c/iit/search?query=securities%20and%20portfolio%20management

UNIT-1

INVESTMENT

1. INVESTMENT: Investment is action (or) process of investing money for profit.

Example: equity shares, preference share and debentures etc.

DEFINITION OF INVESTMENT

"An investment is the purchase of goods that are not consumed today but are used in the future to create wealth".

"An investment is a commitment of funds make in the expectation of some positive rate of return".

According to **oxford dictionary** "investment is defined as the action or process of investment money for profit".

1.1 INTRODUCTION TO STOCK MARKET (OR) STOCKEXCHANGE:

Stock market is a place where securities are bought and sold. Example – Bombay stock exchange

→ The origin of the stock exchange in India started half of 19th century.

→ After the American Civil War 1860 - 1861 the number of brokers dealing with shares is increased.

→ The brokers organized an informal Association in Mumbai named "The native stock and share brokers Association" in 1875.

→ Increased transactions in trade and Commerce during the first and Second World War result in an increase in the stock exchange transactions.

→ Stock exchanges where established in different countries like Chennai, Delhi, Nagpur, Kanpur, Hyderabad and Bangalore.

→ Securities and contract Regulation Act 1956 gave powers to the central government to regulate the stock exchanges.

→ The stock exchange in Mumbai, Kolkata, Chennai, Ahmadabad, Delhi, Hyderabad and Indore recognized by the securities and contract regulations Act 1956.

→ The Bangalore stock exchange was recognized in 1963.

→ At present we have 23 stock exchanges and twenty one of them had hardware and software.

→ Till 20th century floor trading took place in all the stock exchange

→ In the floor trading system the trade takes place through only outcry system trading posts are assigned for different securities when buy and sell activities of securities took place.

→ This system needs a face to face contact among the traders.

→ The trading where not transparent and the system, favored the brokers rather than the investors.

→ The setting up of National Stock Exchange (NSE) and over the counter Exchange of India (OCTCEI) with the screen based trading facility resulted in more and more stock exchange turning towards the computer based trading.

→ Bombay Stock Exchange introduced the screen based trading system in 1995 which is known as Bombay online trading system (BOLT).

→ Bombay stock exchange and national stock exchange being the largest stock exchange in India. Two markets in Stock exchange

A. Primary market

- Funds may be raised through issue of fresh shared at par or premium preference shares, debentures or global depository receipts.
- Stock available for the first time one offered through new issue market.
- The issuer may be a new company or an existing company.

B. Secondary market

- The secondary market deals with outstanding or existing company shares or securities are traded.
- In this secondary market the inventors can sell and buy equity shares.
- Debt instruments like bonds and debentures and also trade in the stock market.

1.2. INVESTMENT OBJECTIVES

I. The main objective of investment is to increase at the rate of return and reduce the risk.

II. other objectives like

1) Safety
2) Liquidity
3) Return
4) Hedge against inflation
5) tax benefit
6) Risk

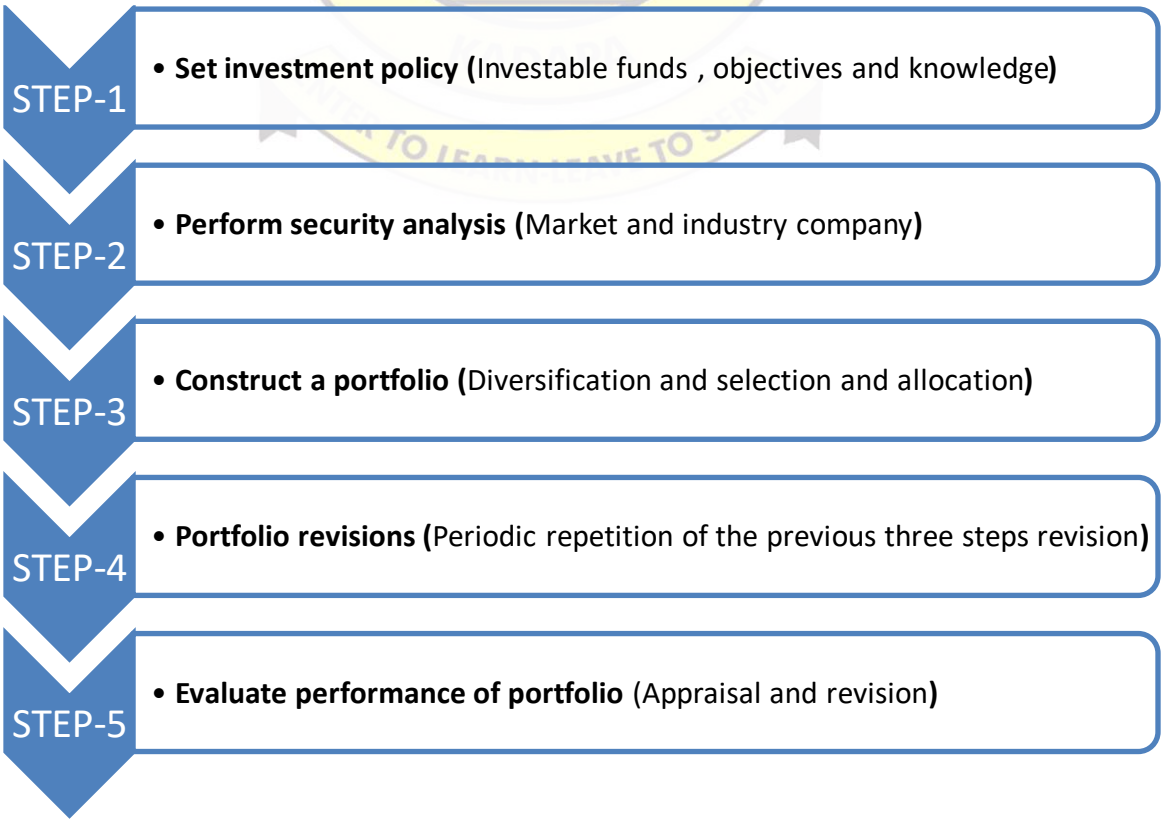
BALAJI INSTITUTE OF I.T.& MANAGEMENT KADAPA ENTER TO LEARN-LEAVE TO SERVE

1) **Safety:** The selected investment should be under the legal and regulatory Framework. Every investor before investing his money he looked into safety for his/her investment.
2) **Liquidity**: Other objectives of investment are liquidity. Liquidity means easily converted into cash marketability of the investment provides liquidity to the investment. The liquidity depends upon the marketing and trading facility.
3) **Return**: Every investor another objective is excess of investment. Investor always expects a good rate of return from their investment.

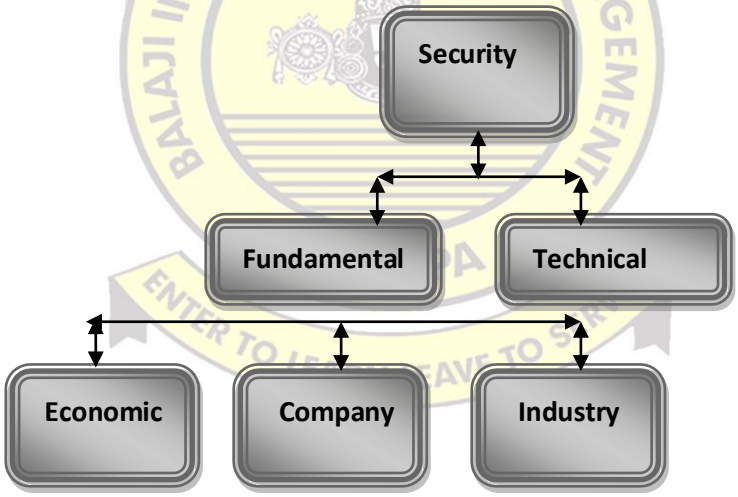
4) **Hedge against inflation**: Since there is inflation in almost all the economy the rate of return should ensure a cover against the inflation. The returns rate should be higher than the rate of inflation.
5) **Tax benefit**: Tax benefit is on one of important objective of the investor this allows investor to reduce it taxable amount this is a Economics bonus which applies to certain investment that are by statute, tax reduced
6) **Risk**: Risk of hold securities is related with the probability of actual returns becoming less than the expected returns. The risk is just an as important as measuring its expected rate of return because minimizing risk and maximizing the rate of return are interrelated objectives in the investment

1.3 PROCESS OF INVESTMENT

The investment process involves how an investor should make decisions about in which marketable securities to invest and when the investment should be made.



1. **STEP-1.Set investment policy:** It is a combination of investor's philosophy and planning. It expresses the investor's attitudes towards important of investment management issues. A comprehensive investment policy should address the following issues.
    - MISSION STATEMENT
    - RISK TOLERANCE
    - INVESTMENT OBJECTIVES
    - POLICY ASSET MIX (allocation of finds to broad asset classes such as stocks and bonds.
    - ACTIVE MANAGEMENT
2. **STEP-2.Perform security analysi:** It involves examining several individual securities (or group of securities) within the broad categories of financial assets. It helps for the selection of securities which are give fair returns in the current and future years.



3. **STEP-3.Construct of portfolio:** It involves identifying those specific assets in which to invest, as well as determining the portions of the investor's wealth to put into each one. Here the issues of selectivity, timing and diversification need to be addressed by the investor. There two approaches to construct portfolio of securities.
    - **Traditional Approach**
    - **Modern Approach** :Markowitz Risk-return optimization model
      : Sharp optimum portfolio model

4. **STEP-4 Portfolio revisions:** It helps for liquidating the unattractive securities and acquiring the new stars from the market. It involves periodic repetition of the previous three steps of the investment policy by setting new investment policy, security analysis afresh, and reallocation of cash for the new portfolio.
    - **Formula Plans** are to ease the problem of timing and minimize the emotions involved in investment.
        1. To minimize loss but not to increase profits.
        2. In formula plans the portfolio investment involve two types
            - ❖ Aggressive Portfolio
            - ❖ Conservative Portfolio
        3. Formula plans classified into four types.
            - ❖ Constant Rupee Plan
            - ❖ Constant Ratio Plan
            - ❖ Variable Ratio Plan
            - ❖ Rupee Cost Averaging Plan

5. **STEP5 Evaluate performance of portfolio:** It involves determining periodically how the portfolio performed, in terms of returns earned and the risk experienced by the investor. For this the investor need to select appropriate benchmark.

The following techniques are used for measuring the performance of the portfolio.

- ❖ **Sharpe's Performance Measure**
- ❖ **Treynor's Performance Measure**
- ❖ **Jensen's Performance Measure**

1.4. INVESTMENTAND SPECULATION

Investment is the employment of fund on asset with the aim of earning income or capital appreciation.

- Investment has two attributes namely time and risk.
- Present consumption is sacrificed to get a return in the future.

- The sacrifice that has to be borne his certain but the return in the future May be uncertain.
- To The Economist in investment is the net addition made to the nation's capital stock that consists of goods and services that are used in the production process.
- Financial investment is the allocation of money to asset that is expected to return same given over a period of time.

Speculation means taking up the business risk in the hope of getting short term gain

- Speculation essentially involves buying and selling activities with the expectation of getting profit from the price fluctuations.
- Purchasing securities with the low price and selling with high price is termed as speculator.
- The speculator is more interested in the market action and its price movement.
- The investor would try to match the risk and return

1.4.1 Investment vs Speculation

Basis of Difference	Investment (Investor)	Speculation
Meaning	Investment is the employment of funds on assets which the aim of earning income or capital appreciation	Speculation means taking up the business risk in the hope of getting short term gain.
Time horizon	Plans for a longer time horizon. His holding period may be from one year to few years	Plans for a very short period. Holding period varies from few days to months.

Risk	Assumes moderate risk	Willing to undertake high risk
Return	Likes to have moderate rate of return associated with limited risk.	Like to have high returns for assuming high-risk.
Decision	Considers fundamentals factors and evaluates the performance of the company regularly.	Considers inside information for market behavior
Funds	Use his own funds and avoids borrowed funds.	Use borrowed funds to supplement his personal resources.

BALAJI INSTITUTE OF I.T.& MANAGEMENT KADAPA ENTER TO LEARN-LEAVE TO SERVE

UNIT-1- IMPORTANT QUESTION

1) Briefly write about Indian stock market.
2) What is investment? Explain the Objectives, Process of Investment.
3) Explain Investment and speculation

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR
(Established by Govt. of A.P., ACT No.30 of 2008)
ANANTHAPURAMU – 515 002 (A.P) INDIA

MASTER OF BUSINESS ADMINISTRATION
MBA; MBA (General Management); MBA (Business Management)
COMMON COURSE STRUCTURE & SYLLABI

Course Code	**Specialization Elective- III**	**L**	**T**	**P**	**C**
21E00305a	**Investment And Portfolio Management**	**4**	**0**	**0**	**4**
	Semester	**III**			

Course Objectives:

- To present and discuss an overview of stock markets.
- To explain concept of investment, process of investment.
- To discuss framework of fundamental and technical analysis under security analysis
- To impart knowledge on estimation and measurement of risk and return.
- To explain process of valuation of different securities.
- To describe the process of portfolio management process, theories, models to measure the performance of portfolio.

Course Outcomes (CO): Student will be able to

- Understand the overview of stock markets.
- Acquire knowledge on process of investment,
- Analyse the security under different types before investing in stocks.
- Ascertain risk and return value of different securities and portfolio
- Learn various portfolio theories, models to manage portfolio and maximise the portfolio returns.

UNIT – I	Lecture Hrs: 8

Investment: Introduction to stock markets - objectives, Process of Investment, Investment and speculation.

UNIT – II	Lecture Hrs: 12

Fundamental Analysis & Technical Analysis: Framework of Fundamental analysis- Economic analysis, Industry analysis-Industry Life cycle - Company analysis, Fundamental Analysis Vs Technical Analysis - Dow Theory.

UNIT - III	Lecture Hrs:12

Measurement of Risk and Return: Revenue Return and Capital appreciation, holding period – Calculation of expected return, Risk factors, risk classification – systematic risk – unsystematic risk – standard deviation – variance– Beta .

UNIT – IV	Lecture Hrs:12

Valuation of Securities: Types of Securities - Approaches of valuation – Bond valuation – Preference share Valuation – Common stock Valuation

UNIT – V	Lecture Hrs:12

Portfolio Management: Process of Portfolio Management, Modern Portfolio – Portfolio models – Markowitz model – Sharpe single index model, Capital Asset Pricing Models.

Textbooks:

1. Investment Management,V.K.Balla, S.Chand Company Ltd
2. Security Analysis and Portfolio Management ,Punithavathy Pandian, Vikas

Reference Books:

- Investment Analysis and portfolio management, Chandra, Tata McGraw Hill .
- Secuerity Analysis Portfolio Management, Ranganatham & Madhumathi, Pearson Education.
- Security Analysis and Portfolio Management, Sudhindra Bhat, excel.
- Security analysis and portfolio management, Avadani, Himalaya publishers.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR
(Established by Govt. of A.P., ACT No.30 of 2008)
ANANTHAPURAMU – 515 002 (A.P) INDIA

MASTER OF BUSINESS ADMINISTRATION
MBA; MBA (General Management); MBA (Business Management)
COMMON COURSE STRUCTURE

- Investment analysis portfolio management, Frank Reilly & Brown, Cengage.
- Investment Management, Preethi Singh, Himalaya Publishing House, Mumbai..
- Investment, Bodie, McGraw Hill Book Company.
- Investment Management ,Hiriyappa ,New Age Publications

Online Learning Resources:

https://www.bcci.bg/projects/latvia/pdf/8_IAPM_final.pdf
https://backup.pondiuni.edu.in/sites/default/files/investment%26portfolio-260214.pdf
https://sist.sathyabama.ac.in/sist_coursematerial/uploads/SBAA7002.pdf
https://www.youtube.com/c/iit/search?query=securities%20and%20portfolio%20management

UNIT-2
FUNDAMENTAL ANALYSIS & TECHNICAL ANALYSIS

2.1 FRAMEWORK OF FUNDAMENTAL ANALYSIS: The intrinsic value of an equity share depends on a multitude of factors. The earning of the company the growth rate and the risk exposure of the company has a direct bearing on the price of the share.

Fundamental analysis consists of

A. Economic analysis
B. Industry analysis
C. Company analysis

2.1.A . ECONOMIC ANALYSIS: The level of economic activity has an impact on investment in many ways. If the economy grows rapidly, the industry can also be expected to show Rapid growth and vice versa. The economics analysis is essential to understand the behavior of the stock prices the economic analysis factors for as follows

a) **Gross Domestic Product (GDP):** GDP indicate the rate of growth of the economy. GDP represents the aggregate value of the goods and services produced in the economy. The higher growth rate are more favorable to the stock market.

b) **Savings and investments:** It is obvious that growth requires investment which in turn requires substantial amount of domestic savings. The saving the Savings and investment patterns of public affect the stocks to a great extent.

c) **Inflation:** High rate of inflation is harmful to the stock market. Inflation means increasing of share prices.

d) **Interest rates:** the interest rate affects the cost of Financing to the firms. A decrease in interest rate implies lower cost of finance for firms and profitability.

e) **Budget:** The budget draft provides an elaborate account of the government revenues and expenditure. A deficit budget may affect the

cost of production. Supplies budget may results in deflation. Hence balanced budget is highly favorable to the stock markets.

f) **Tax structure:** The tax structure also influence the stock market low tax structure will give a scope to increase to investment in stock market.

g) **The balance of payment:** The balance of payment is a measure of the strength of rupee on external account receipts-payments is the balance of payment receipts are more payments are less than the balance of payment is in surplus. Surplus balance of payment is a positive effect on the stock market.

h) **Monsoon and Agriculture:** Agriculture is also directly and indirectly affects the stock market because some Industries like sugar, cotton, Textiles and food depends on monsoon and Agriculture.

i) **Infrastructure facilities:** Infrastructure facilities are essential for the growth of industries and Agricultural sector. This will impact on stock market.

2.1. B INDUSTRY ANALYSIS: After conducting Economic analysis look into various industries. Industry is a group of firms that have similar the technological of productions and produce similar products. Analyzing different industries is call industry analysis.

2.1.B.1 KEY CHARACTERISTICS/ FACTORS OF INDUSTRY ANALYSIS:

1. **Past sales and earnings:** to analyze industry past sales and earnings will help us to forecast the future of the industry.
2. **Permanence:** if the analyst feels the technology used in the particular industry is having the long future the investment will give more returns.
3. **Government attitude towards industry:** This analysis helps the investor to know the government is positive or negative towards the

particular Industry. If the government is favorable about industry than the goods return in the future.

4. **Labour conditions:** labour conditions are also important to the investors to know the industry future.
5. **Competitive conditions:** the industry competitive conditions is healthy than it is good sign for profits visa versa.
6. **Product differentiation advantages:** That selected industry producing unique product that particular industry have more demand.
7. **SWOT analysis**: every investor has to analysis that the internal strength and weakness. External opportunities and threats of the industry
8. **Industries share price relative Industry:** Industry share price and earning also influence the investors to purchase or sale of shares

2.1.B.2 CLASSIFICATION BY BUSINESS CYCLE/INDUSTRY CLASSIFICATION:

1. Growth industries: These industries grow consistently and its growth and its growth may exceed the average growth of the economy.

- High rate of earnings
- Wider expansion of business
- By considering technological changes
- By considering 20th industry: - 1) Automobile industry 2) Aero plane industry
- 1940's → Photography industry
  1950's → Color television industry, Computers industry
  1960's → Pharmaceutical industry, Communication
  2000's →Software industry
  Present →cellular industry, Genetic engineering and Environmental Management.

2. Cyclical Industries: These industries mostly likely the benefit from a period of economic prosperity and most likely suffers from economic recession.

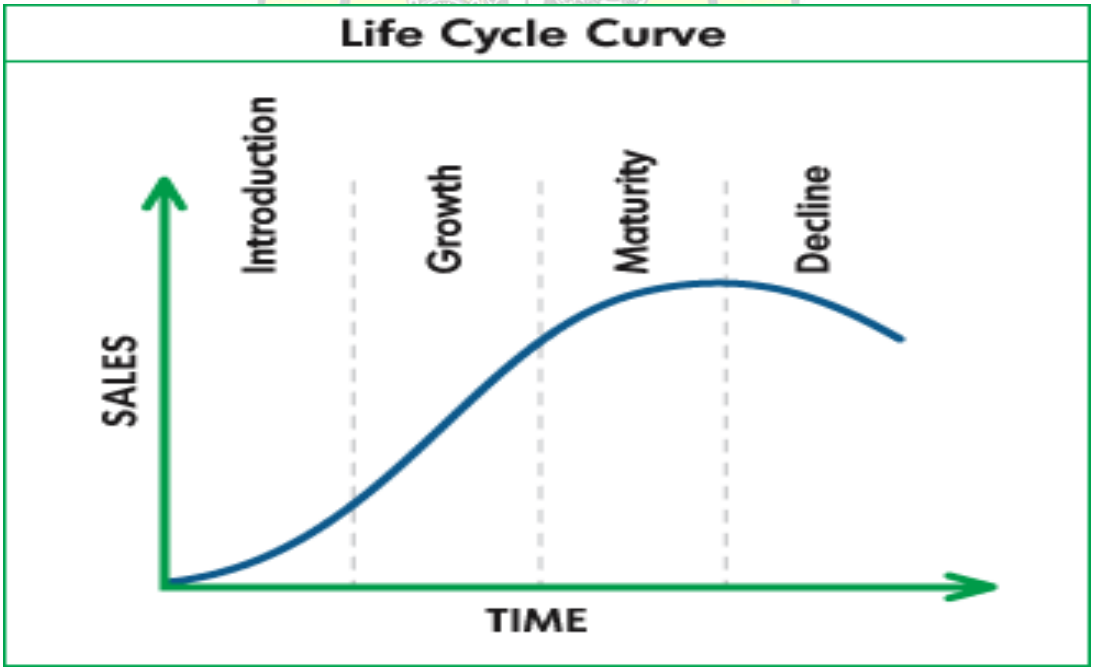
Ex: Fridges, Washing machines and Seasonal products.

3. Defensive Industries: These industries specify the movement of the business cycle. Defensive industries often contain firms whose securities on investor might hold for income. Food and shelter are the basic requirements of humanity. These types of industries we can consider as defensive industries.

4. Cyclical Growth Industries: These industries pass both characteristics of cyclical growth industries. Ex: Automobile industries; because these industry experiences period of stagnation, decline but they grow tremendously

2.1.B.3 INDUSTRY LIFE CYCLE:

The industry life cycle theory is generally attitude to Julius **grodensky**. The life cycle of the industry is separated into 4 well designer stages such as:



1. Introduction/Pioneering stage
2. Rapid growth stage
3. Maturity stage
4. Declining stage

1. Introduction/Pioneering stage: In this stage the demand of the product is low. Company tries to develop branded name and image in this stage it is difficult to select company is because the survival rate is unknown.

Example: Genetic engineering

2. Growth stage: this stage starts with the appearance of surviving firms from the pioneering stage in this stage companies is growth strongly in market share and financial performance. This will create domain for company sharing.

Example: Software Industry

3. Maturity stage: In this stage is the growth rate tense to Moderate and the rate of the growth would be more or less equal to the industrial growth rate or the Gross Domestic Product growth rates. Sales may be increasing at a slower rate. Indicates labour cost enhancing in technology and stationery demands.

4. Declining stage: In the stage demand for the particular product and the earning of the companies in the industry decline. Nowadays very few customers using black and white TV. Innovation of new product and change in customer preference lead to this stage it is better to avoid investing in the share of the low growth Industries even in the Boom period.

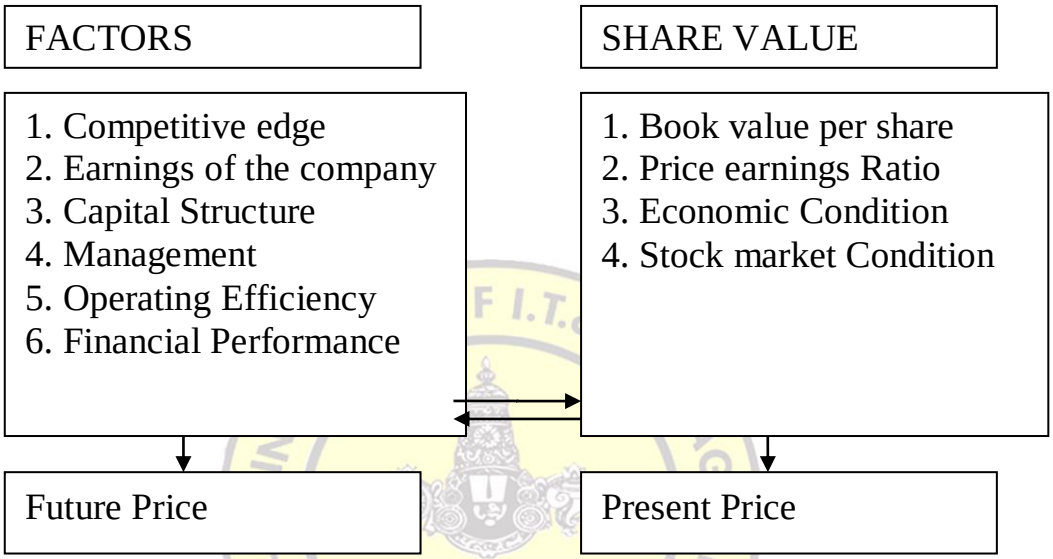
2.1.C COMPANY ANALYSIS: After analyzing economic and industry analysis investor look into company analysis. Analyzing company condition is called company analysis. For earning profits investors apply a simple and common sense decision rule of maximization. That is:

- Buy the share at a low price
- Sell the share at a high price

The above decision rule is very simple to understand, but difficult to apply in actual price. For this investor need to knowhow to find out whether the price of a company's share is low or high?What is the benchmark used to compare the price of the share?

These values are depending on Economy, Industry and Company fundamentals.

Company level analysis provides a direct link to investor's action and his investment goals in operational terms. The following fundamentals we have to analyze for knowing intrinsic value of the security.



FACTORS

- ✓ **Competitive edge:-**The first variable that influences future earnings is competitive edge. For competitive of any company we have to see marketing results of the firm in comparison to industry. This is determined by the share of the company in the industry, growth of its sales and stability of sales.

- ✓ **Earnings of the company:** Before we start analysis of company we should see its accounting policies. There is a risk of faulty interpretation of corporate earnings and consequent bad judgment in purchasing or selling stock. The accounting variations in reporting cost, expenses and extraordinary items could change earnings to a great extent.
- ✓ **Capital structure:** The return on equity holder's investment can be magnified by using financial leverage, i.e. using debt financing instead of equity financing. This use of financial leverage may be measured by capitalization ratios which indicate the extent to which the firm

finances its assets by use of debt or preference shares. These ratios are also referred as debt ratios.

- ✓ **Management:** Some experts believe that the quality of a company's management may be single most important influence on its future profitability and overall success. The analysts can evaluate management by getting information on some specific questions such as listed below.
  i. What is the age and experience characteristic of management?
  ii. How effective is the company's strategic planning?
  iii. Has company developed and followed a sound marketing strategy?

- ✓ **Operating efficiency:** The operating efficiency and the earnings of the company are directly influenced by the company's operating characteristics. A company that is constantly expanding its physical facilities and continues to operate at full capacity is more likely to produce profits and earnings in future.

- ✓ **Financial performance:** The analyst has to analyze financial statements for knowing financial strengths and weaknesses of the company; which helpful for identifying intrinsic value of the security. The following tools are to be used for analyzing financial strengths and weaknesses of the company. i.e Ratio analysis, Comparative analysis, Common size analysis, Trend analysis, Funds flow analysis, Cash flow analysis, Break even analysis.

SHARE VALUE:

- ✓ **Book value per share:** It determine the amount available to shareholders after paying all business liabilities , preference dividend etc.,

$$Book\ value\ per\ share = \frac{equity\ share\ capital + reserves}{number\ of\ outstanding\ shares}$$

This value is higher than the Par value; it is healthy sign to the company. At this time company issue bonus shares.

✓ **Price Earnings Ratio:**

- It is the most financial parameter to know the value of security.
- It represents how many times the company's future earnings is willing to offer the shareholders.
- It is the multiplying factor that the market willing to offer to the company future earnings.

$$\frac{P}{E}Ratio = \frac{Marhet\ price\ per\ share}{Earnings\ per\ share}$$

- If Current P/E Ratio> Expected P/E Ratio then the stock is overpriced. It means stock price reached peak position because in the future the stock price may falls down. It is suggested to investor to sell the security.
- If Current P/E Ratio< Expected P/E Ratio then the stock is underpriced. It in the future the stock will increase. It is suggested to investor to buy the security.
- If Current P/E Ratio= Expected P/E Ratio then the stock is correctly priced. It means there is no change in the future share price.

✓ **Economic conditions:** A country's economic conditions are influenced by numerous macroeconomic and microeconomic factors, including monetary and fiscal policy, the state of the global economy, unemployment levels, productivity, exchange rates, inflation and many others.

✓ **Stock market conditions**: Stock market condition is also consider in company analysis

The above all factors will provide information to the investor for forecasting the future price of the security. The following factors will provide information to the analyst for knowing present price of the security and to confirm the future price changes.

2.2. TECHNICAL ANALYSIS

Meaning: It is the process of identifying trend reversal at the earliest to formulate the buying and selling strategy

- ➔ Technical analysis is a method of evaluating securities by analyzing the statistics generated by marketing activities: such as fast price and volume.
- ➔ Technical analysis does not attempt to measure a securities in intrinsic values but instead use charts and other tools to identify pattern that can suggest future Activity.
- ➔ Technical analysis takes a completely different approach; it doesn't care one bit about the "value" of a company or a commodity. Technicians (sometimes called chartists) are only interested in the price movements in the market.
- ➔ Technical analysis attempts to understand the emotions in the market by studying the market itself, as opposed to its components.
- ➔ Technical analysis really just studies supply and demand in a market in an attempt to determine what direction, or trend, will continue in the future.
- ➔ Technical analysis is a method of evaluating securities by analyzing the statistics generated by market activity, such as past prices and volume.
- ➔ Technical analysts do not attempt to measure a security's intrinsic value, but instead use charts and other tools to identify patterns that can suggest future activity.

2.2.1 ASSUMPTION

- The market value of the scrip is determined by the interaction of supply and demand.
- The market discounts everything.
- The market always moves in trend.
- Any layman knows the fact that history repeats itself.

2.2.2 HISTORY OF TECHNOLOGICAL ANALYSIS:

The technical analysis is based on the doctrine in given by Charles H Dow in 1884 in the wall Street Journal. he wrote a series of articles in the Wall Street Journal.

A.J. NELSON, a close friend of Charles Dow formalized the dow theory of economic forecasting the analysts used charts of individual stocks and moving averages in the early 1920's later on with the aid of calculators and computer sophisticated techniques come into vogue.

2.2.3 TECHNICAL TOOLS:

Generally used technical tools for Dow theory, volume of trending, short selling odd lot trading bars and line charts, moving average and oscillators.

2.2.4 THE USE OF TREND

One of the most important concepts in technical analysis is that of trend.

- A trend is really nothing more than the general direction in which a security or market is headed.
- In any given chart, you will probably notice that prices do not tend to move in a straight line in any direction, but rather in a series of high and low.
- In technical analysis, it is the movement of the high and low that constitutes a trend.
- There are three types of trend:
  - **Uptrend:** When each successive peak and trough is higher, it's referred to as an upward trend.
  - **Downtrend:** If the peaks and troughs are getting lower, it's a downtrend.
  - **Sideways/Horizontal Trend:** When there is little movement up or down in the peaks and troughs, it's a sideways or horizontal trend.

Along with these three trend directions based on trend lengths

A trend of any direction can be classified:

- Long-term trend,

- Intermediate trend
- Short-term trend.

2.2.5 TREND LINE: A trend line is a simple charting technique that adds a line to a chart to represent the trend in the market or a stock. An upward trend line is drawn at the lows of an upward trend. This line represents the support the stock has every time it moves from a high to a low. This type of trend line helps traders to anticipate the point at which a stock's price will begin moving upwards again. A downward trend line is drawn at the highs of the downward trend. This line represents the resistance level that a stock faces every time the price moves from a low to a high.

.

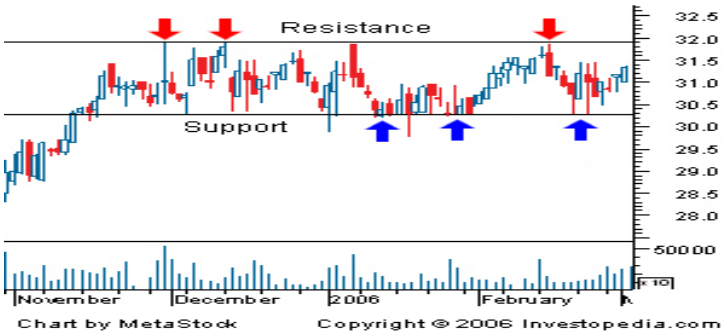
The Importance of Trend:

It is important to be able to understand and identify trends so that you can trade with rather than against them.

Support and Resistance

Once you understand the concept of a trend, the next major concept is that of support and resistance.

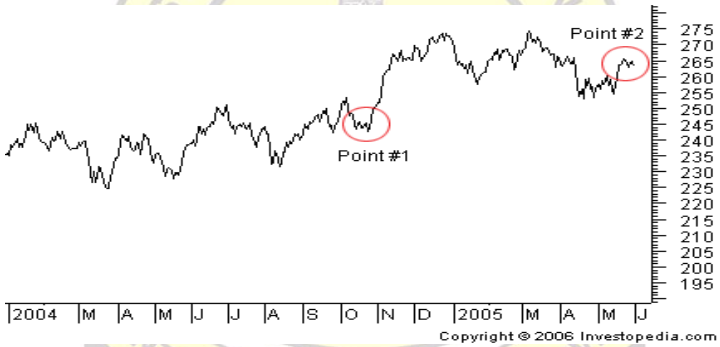
You'll often hear technical analysts talk about the ongoing battle between the bulls and the bears, or the struggle between buyers (demand) and sellers (supply). This is revealed by the prices a security seldom moves above (resistance) or below (support).



Support is the price level through which a stock or market seldom falls (illustrated by the blue arrows). Resistance, on the other hand, is the price level that a stock or market seldom surpasses (illustrated by the red arrows).

2.2.6 CHARTS: A chart is simply a graphical representation of a series of prices over a set time frame.

For example, a chart may show a stock's price movement over a one-year period, where each point on the graph represents the closing price for each day the stock is traded.



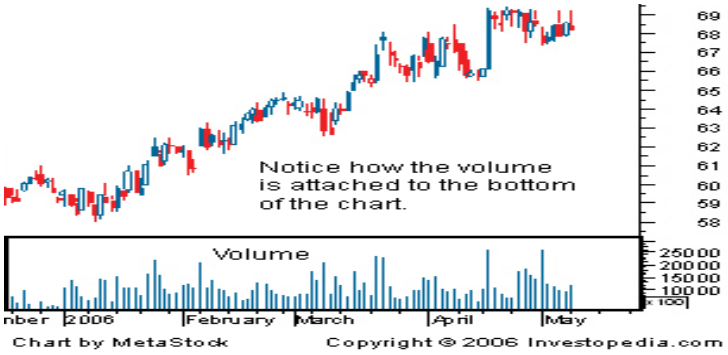
The bottom of the graph, running horizontally (x-axis), is the date or time scale.

On the right hand side, running vertically (y-axis), the price of the security is shown.

2.2.7 VOLUME:

- Volume is simply the number of shares or contracts that trade over a given period of time, usually a day.
- The higher the volume, the more active the security. To determine the movement of the volume (up or down), chartists look at the volume bars that can usually be found at the bottom of any chart.
- Volume bars illustrate how many shares have traded per period and show trends in the same way that prices do.

- Volume is an important aspect of technical analysis because it is used to confirm trends and chart patterns.
- Any price movement up or down with relatively high volume is seen as a stronger, more relevant move than a similar move with weak volume.

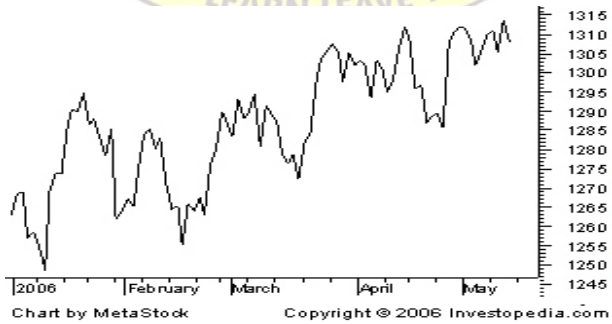


2.2.8 CHART TYPES

There are four main types of charts that are used by investors and traders depending on the information that they are buy and sell the shares

a) **Line chart**
b) **Bar chart**
c) **Candlestick chart**
d) **Point and Figure chart**

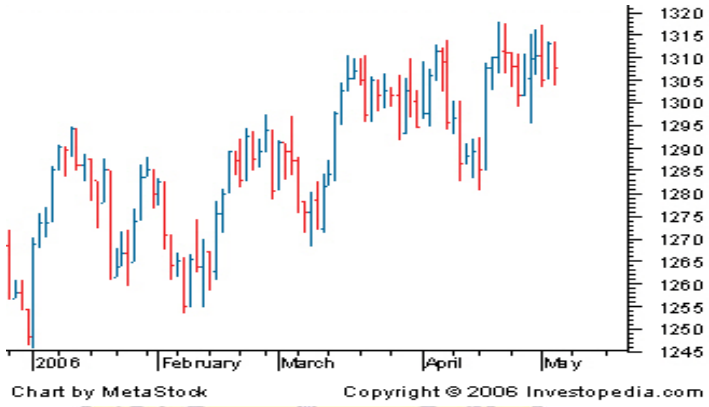
a) Line chart: It represents only the closing prices over a set period of time. The line is formed by connecting the closing prices over the time frame. Line charts do not provide visual information of the trading range for the individual points such as the high, low and opening prices.



b) Bar chart: The bar chart expands on the line chart by adding several more key pieces of information to each data point.

- The chart is made up of a series of vertical lines that represent each data point.

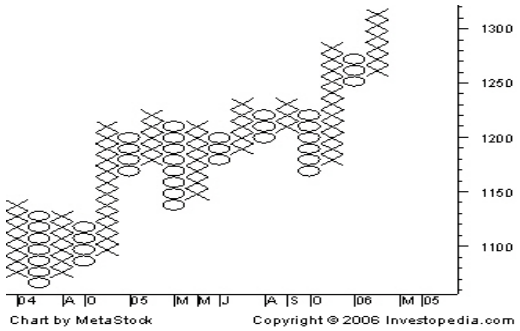
- This vertical line represents the high and low for the trading period, along with the closing price.
- The close and open are represented on the vertical line by a horizontal dash. The opening price on a bar chart is illustrated by the dash that is located on the left side of the vertical bar. Conversely, the close is represented by the dash on the right.



c) Candlestick Chart: The candlestick chart is similar to a bar chart, but it differs in the way that it is visually constructed.

- Similar to the bar chart, the candlestick also has a thin vertical line showing the period's trading range.
- There are two color constructs for days up and one for days that the price falls.
- When the price of the stock is up and closes above the opening trade, the candlestick will usually be white or clear.
- If the stock has traded down for the period, then the candlestick will usually be red or black, depending on the site.

d) Point and Figure Chart: The point and figure chart is not well known or used by the average investor but it has had a long history of use seeing back to the first technical traders. This type of chart reflects price movements and is not as concerned about time and volume in the formulation of the points.



When first looking at a point and figure chart, you will notice a series of Xs and Os. The Xs represent upward price trends and the Os represent downward price trends. There are also numbers and letters in the chart; these represent months, and give investors an idea of the date.

Each box on the chart represents the price scale, which adjusts depending on the price of the stock: the higher the stock's price the more each box represents.

The other critical point of a point and figure chart is the reversal criteria. The reversal criteria set how much the price has to move in order for a column of Xs to become a column of Os, or vice versa. When the price trend has moved from one trend to another, it shifts to the right, signaling a trend change.

2.2.9 CHART PATTERNS: Charts are one of the most fundamental aspects of technical analysis. It is important that you clearly understand what is being shown on a chart and the information that it provides. Now that we have an idea of how charts are constructed, we can move on to the different types of chart patterns. A chart pattern is a distinct formation on a stock chart that creates a trading signal, or a sign of future price movements. Chartists use these patterns to identify current trends and trend reversals and to trigger buy and sell signals. There are two types of patterns within this area of technical analysis, reversal and continuation.

- A reversal pattern signals that a prior trend will reverse upon completion of the pattern.
- A continuation pattern, on the other hand, signals that a trend will continue once the pattern is complete. These patterns can be found over charts of any timeframe.

We will review some of the more popular chart patterns:

- Head and Shoulders &inverse head and shoulders
- Cup and Handle
- Double Tops and Bottoms
- Triangles
- Flag and Pennant
- Wedge
- Triple Tops and Bottoms
- Rounding Bottom

Fundamental analysis and technical analysis, the major schools of thought when it comes to approaching the markets, are at opposite ends of the spectrum. Both methods are used for researching and forecasting future trends in stock prices, and like any investment strategy or philosophy, both have their advocates and adversaries.

2.3 TECHNICAL ANALYSIS VS FUNDAMENTAL ANALYSIS

- Fundamental analysis is a method of evaluating securities by attempting to measure the intrinsic value of a stock. Fundamental analysts study everything from the overall economy and industry conditions to the financial condition and management of companies. Earnings, expenses, assets and liabilities are all important characteristics to fundamental analysts.
- Technical analysis differs from fundamental analysis in that the stock's price and volume are the only inputs. The core assumption is that all known fundamentals are factored into price; thus, there is no need to pay close attention to them. Technical analysts do not attempt to measure a security's intrinsic value, but instead use stock charts to identify patterns and trends that suggest what a stock will do in the future.
- The most popular forms of technical analysis are simple moving averages, support and resistance, trend lines and momentum-based indicators.
- Simple moving averages are indicators that help assess the stock's trend by averaging the daily price over a fixed time period. Buy and sell signals are generated when a shorter duration moving average crosses a longer duration one.

- Support and resistance utilize price history. Support is defined as areas where buyers have stepped in before, while resistance consists of the areas where sellers have impeded price advance. Practitioners look to buy at support and sell at resistance.
- Trend lines are similar to support and resistance, as they give defined entry and exit points. However, they differ in that they are projections based on how the stock has traded in the past. They are often utilized for stocks moving to new highs or new lows where there is no price history.

Basis of difference	Fundamental Analysis	Technical Analysis
Definition	Calculates stock value using economic factors, known as fundamentals.	Uses price movement of security to predict future price movements
Data gathered from	Financial statements	Charts
Stock bought	When price falls below intrinsic value	When trader believes they can sell it on for a higher price
Time horizon	Long-term approach	Short-term approach
Function	Investing	Trade
Concepts used	Return on Equity (ROE) and Return on Assets (ROA)	Dow Theory, Price Data
Vision	looks backward as well as forward	looks backward

1.4 DOW THEORY

The Dow Theory is an approach to trading developed by Charles H. Dow who, with Edward Jones and Charles Bergstresser, founded Dow Jones & Company, Inc. and developed the Dow Jones Industrial Average (DJIA). Dow fleshed out the theory in a series of editorials in the Wall Street Journal, which he co-founded.

Before we can get into the specifics of Dow theory trend analysis, we need to understand trends. First, it's important to note that while the market tends to move in a general direction, or trend, it doesn't do so in a straight line. The market will rally up to a high (peak) and then sell off to a low (trough), but will generally move in one direction. (For related reading, see Peak-and-Trough Analysis.)

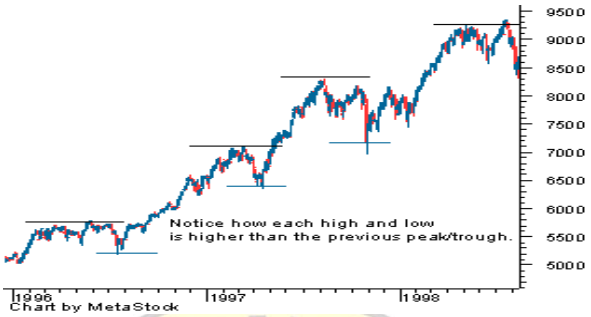


Figure 1: an uptrend

An upward trend is broken up into several rallies, where each rally has a high and a low. For a market to be considered in an uptrend, each peak in the rally must reach a higher level than the previous rally's peak, and each low in the rally must be higher than the previous rally's low.

A downward trend is broken up into several sell-offs, in which each sell-off also has a high and a low. To be considered a downtrend in Dow terms, each new low in the sell-off must be lower than the previous sell-offs low and the peak in the sell-off must be lower than the peak in the previous sell-off. (For more, see: Technical Analysis: The Use of Trend)

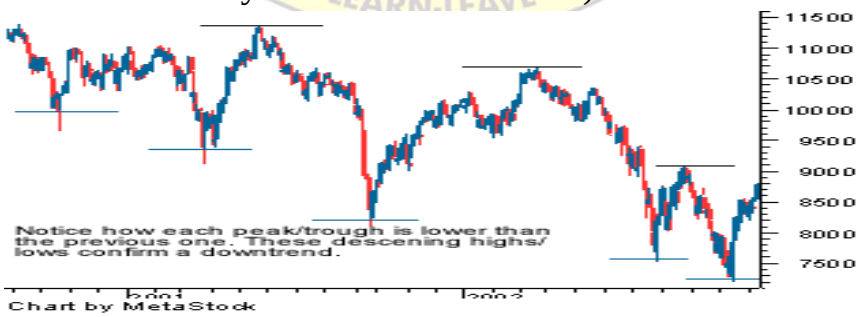


Figure 2: a downtrend

Now that we understand how Dow Theory defines a trend, we can look at the finer points of trend analysis.Dow theory identifies three trends within the market: primary, secondary and minor. A primary trend is the largest trend lasting for more than a year, while a secondary trend is an intermediate trend

that lasts three weeks to three months and is often associated with a movement against the primary trend. Finally, the minor trend often lasts less than three weeks and is associated with the movements in the intermediate trend.

a) Primary Trend

In Dow Theory, the primary trend is the major trend of the market, which makes it the most important one to determine. This is because the overriding trend is the one that affects the movements in stock prices. The primary trend will also impact the secondary and minor trends within the market. (For related reading, see Short-, Intermediate- and Long-Term Trends.*)*

Dow determined that a primary trend will generally last between one and three years but could vary in some instances.

Figure 3: an uptrend with corrections

For example, if in an uptrend the price closes below the low of a previously established trough, it could be a sign that the market is headed lower, and not higher.

When reviewing trends, one of the most difficult things to determine is how long the price movement within a primary trend will last before it reverses. The most important aspect is to identify the direction of this trend and to trade with it, and not against it, until the weight of evidence suggests that the primary trend has reversed.

b) Secondary, or Intermediate, Trend

In Dow Theory, a primary trend is the main direction in which the market is moving. Conversely, a secondary trend moves in the opposite direction of the primary trend, or as a correction to the primary trend.

For example, an upward primary trend will be composed of secondary downward trends. This is the movement from a consecutively higher high to

a consecutively lower high. In a primary downward trend the secondary trend will be an upward move, or a rally. This is the movement from a consecutively lower low to a consecutively higher low.

Below is an illustration of a secondary trend within a primary uptrend. Notice how the short-term highs (shown by the horizontal lines) fail to create successively higher peaks, suggesting that a short-term downtrend is present. Since the retracement does not fall below the February low, traders would use this to confirm the validity of the correction within a primary uptrend.

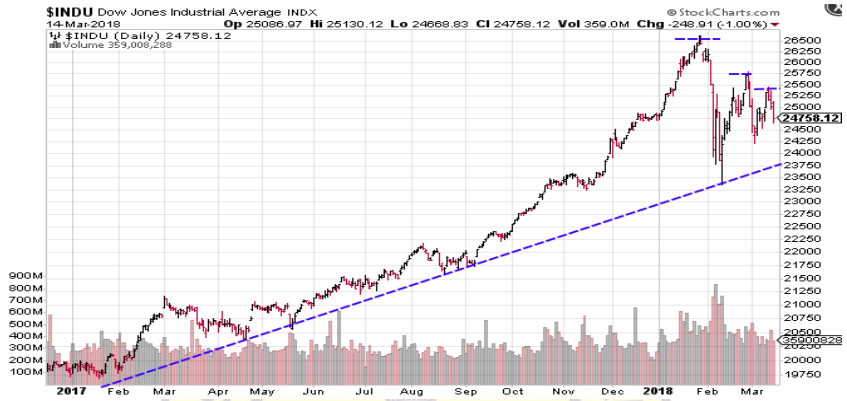
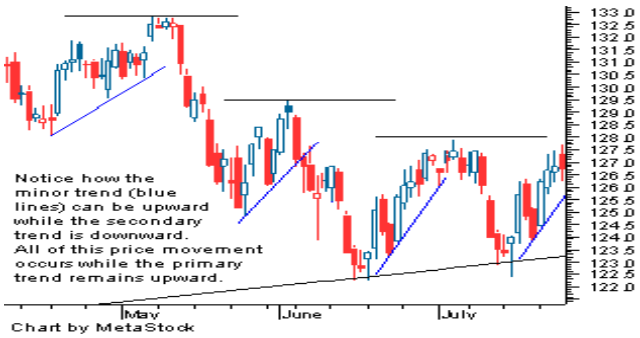


Figure 4: a secondary trend w/ a primary uptrend

In general, a secondary, or intermediate, trend typically lasts between three weeks and three months, while the retracement of the secondary trend generally ranges between one-third to two-thirds of the primary trend's movement. For example, if the primary upward trend moved the DJIA from 20,000 to 22,500 (2,500 points), the secondary trend would be expected to send the DJIA down at least 833 points (one-third of 2,500). Another important characteristic of a secondary trend is that its moves are often more volatile than those of the primary move.

c) Minor Trend

The last of the three trend types in Dow Theory is the minor trend, which is defined as a market movement lasting less than three weeks. The minor trend is generally the corrective moves within a secondary move, or those moves that go against the direction of the secondary trend.



Due to its short-term nature and the longer-term focus of Dow Theory, the minor trend is not of major concern to Dow Theory followers. But this doesn't mean it is completely irrelevant; the minor trend is watched with the large picture in mind, as these short-term price movements are a part of both the primary and secondary trends.

Most proponents of Dow Theory focus their attention on the primary and secondary trends, as minor trends tend to include a considerable amount of noise. If too much focus is placed on minor trends, it can to lead to irrational trading, as traders get distracted by short-term volatility and lose sight of the bigger picture.

Stated simply, the greater the time period a trend comprises, the more important the trend.

Unit-2- IMPORTANT QUESTION

1. How does technical analysis differ from fundamental analysis? Explain
2. A technical analyst explains that the stock market acts like a barometer rather than a thermometer-Elaborate.
3. Explain fundamental analysis.
4. Elucidate technical analysis.
5. Write a short note on
   a)Industry Life cycle b)Dow Theory.
6. Fundamental Analysis Vs Technical Analysis.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR
(Established by Govt. of A.P., ACT No.30 of 2008)
ANANTHAPURAMU – 515 002 (A.P) INDIA

MASTER OF BUSINESS ADMINISTRATION
MBA; MBA (General Management); MBA (Business Management)
COMMON COURSE STRUCTURE & SYLLABI

Course Code	**Specialization Elective- III**	**L**	**T**	**P**	**C**
21E00305a	**Investment And Portfolio Management**	**4**	**0**	**0**	**4**
	Semester	**III**			

Course Objectives:

- To present and discuss an overview of stock markets.
- To explain concept of investment, process of investment.
- To discuss framework of fundamental and technical analysis under security analysis
- To impart knowledge on estimation and measurement of risk and return.
- To explain process of valuation of different securities.
- To describe the process of portfolio management process, theories, models to measure the performance of portfolio.

Course Outcomes (CO): Student will be able to

- Understand the overview of stock markets.
- Acquire knowledge on process of investment,
- Analyse the security under different types before investing in stocks.
- Ascertain risk and return value of different securities and portfolio
- Learn various portfolio theories, models to manage portfolio and maximise the portfolio returns.

UNIT – I	Lecture Hrs: 8

Investment: Introduction to stock markets - objectives, Process of Investment, Investment and speculation.

UNIT – II	Lecture Hrs: 12

Fundamental Analysis & Technical Analysis: Framework of Fundamental analysis- Economic analysis, Industry analysis-Industry Life cycle - Company analysis, Fundamental Analysis Vs Technical Analysis - Dow Theory.

UNIT - III	Lecture Hrs:12

Measurement of Risk and Return: Revenue Return and Capital appreciation, holding period – Calculation of expected return, Risk factors, risk classification – systematic risk – unsystematic risk – standard deviation – variance– Beta .

UNIT – IV	Lecture Hrs:12

Valuation of Securities: Types of Securities - Approaches of valuation – Bond valuation – Preference share Valuation – Common stock Valuation

UNIT – V	Lecture Hrs:12

Portfolio Management: Process of Portfolio Management, Modern Portfolio – Portfolio models – Markowitz model – Sharpe single index model, Capital Asset Pricing Models.

Textbooks:

1. Investment Management,V.K.Balla, S.Chand Company Ltd
2. Security Analysis and Portfolio Management ,Punithavathy Pandian, Vikas

Reference Books:

- Investment Analysis and portfolio management, Chandra, Tata McGraw Hill .
- Secuerity Analysis Portfolio Management, Ranganatham & Madhumathi, Pearson Education.
- Security Analysis and Portfolio Management, Sudhindra Bhat, excel.
- Security analysis and portfolio management, Avadani, Himalaya publishers.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR
(Established by Govt. of A.P., ACT No.30 of 2008)
ANANTHAPURAMU – 515 002 (A.P) INDIA

MASTER OF BUSINESS ADMINISTRATION
MBA; MBA (General Management); MBA (Business Management)
COMMON COURSE STRUCTURE

- Investment analysis portfolio management, Frank Reilly & Brown, Cengage.
- Investment Management, Preethi Singh, Himalaya Publishing House, Mumbai..
- Investment, Bodie, McGraw Hill Book Company.
- Investment Management ,Hiriyappa ,New Age Publications

Online Learning Resources:

https://www.bcci.bg/projects/latvia/pdf/8_IAPM_final.pdf
https://backup.pondiuni.edu.in/sites/default/files/investment%26portfolio-260214.pdf
https://sist.sathyabama.ac.in/sist_coursematerial/uploads/SBAA7002.pdf
https://www.youtube.com/c/iit/search?query=securities%20and%20portfolio%20management

UNIT-3
MEASUREMENT OF RISK AND RETURN

3.1 REVENUE RETURN-RETURN ON REVENUE

Revenue Return orReturn on revenue (ROR)is a measure of company profitability that is calculated by dividing net income by revenue. A business can increase ROR by increasing profit with a change in sales mix or by cutting expenses. ROR also has an impact on a firm's earnings per share (EPS), and analysts use ROR to make investment decisions.

Return on revenue uses net income, which is calculated as revenues minus expenses. The calculation includes both expenses paid in cash and non-cash expenses, such as depreciation. The net income calculation includes all of the business activities of the company, which includes day-to-day operations and unusual items, such as the sale of a building. Revenue, on the other hand, represents sales, and the balance is reduced by sales discounts and other deductions, such as sales returns and allowances

Examples of Sales Mix

A company can improve its ROR by increasing its net income. Changing the sales mix can increase net income. The sales mix is the proportion of each product a business sells, relative to total sales. Each product sold may deliver a different level of profit. Businesses measure the profit generated using profit margin (net income/sales). By shifting company sales to products that provide a higher profit margin, a business can increase net income and improve ROR.

Assume, for example, that a sporting goods store sells an $80 baseball glove that generates a $16 profit and a $200 baseball bat that produces a $20 profit. While the bat generates more revenue, the glove produces a 20% profit ($16 / $80), and the bat only earns a 10% profit ($20 / $200). By shifting the store's sales and marketing effort to baseball gloves, the business can earn more net income per dollar of sales, which increases ROR.

3.2 CAPITAL APPRECIATION

Capital appreciation is a rise in the value of an asset based on a rise in market price. It occurs when the asset invested commands a higher price in the market than an investor originally paid for the asset. The capital appreciation portion of the investment includes all of the market value exceeding the original investment or cost basis.

Capital appreciation is an increase in the price or value of assets. It may refer to appreciation of company stocks or bonds held by an investor, an increase in land valuation, or other upward revaluation of fixed assets.

Capital appreciation may occur passively and gradually, without the investor taking any action. It is distinguished from a capital gain which is the profit achieved by selling an asset. Capital appreciation may or may not be shown in financial statements; if it is shown, by revaluation of the asset, the increase is said to be "recognized". Once the asset is sold, the appreciation since the date of initially buying the asset becomes a "realized" gain.

When the term is used in reference to stock valuation, capital appreciation is the goal of an investor seeking long term growth. It is growth in the principal amount invested, but not necessarily an increase in the current income from the asset.

In the context of investment in a mutual fund, capital appreciation refers to a rise in the value of the securities in a portfolio which contributes to the growth in net asset value. A capital appreciation fund is a fund for which it is its primary goal, and accordingly invests in growth stocks

Capital appreciation is one of the two main sources of investment returns, with the others being dividend or interest income. The combination of capital appreciation with dividend or interest returns is referred to as total return. Capital appreciation can occur for many different reasons in different markets and asset classes. It can also occur with financial assets such as stocks or with real assets such as real estate.

Example of Capital Appreciation

An investor purchases a stock for $10 and the stock pays an annual dividend of $1, equating to a dividend yield of 10%. A year later, the stock is trading at $15 per share and the investor has received the dividend of $1. The investor has a return of $5 from capital appreciation as the price of the stock went from the purchase price or cost basis of $10 to a current market value of $15; in percentage terms, the stock price increase led to a return from capital appreciation of 50%. The dividend income return is $1, equating to a return of 10% in line with the original dividend yield. The return from capital appreciation combined with the return from the dividend leads to a total return on the stock of $6 or 60%.

3.2.1 CAUSES OF CAPITAL APPRECIATION

The value of assets can increase for several reasons. There can be a general trend for asset values to increase including macroeconomics factors such as strong GDP growth or Federal Reserve policy such as lowering interest rates. On a more granular level, a stock price can increase because the underlying company is growing faster than analysts expect, or the value of a house can increase because of proximity to new developments such as schools or shopping centres.

3.3 HOLDING PERIOD

A holding period is the amount of time the investment is held by an investor or the period between the purchase and sale of a security. In a long position, the holding period refers to the time between an asset's purchase and its sale. In a short options position, the holding period is the time between when a short seller buys back the securities and when the security is delivered to the lender to close the short position.

The holding period of an investment is used to determine the taxing of capital gains or losses. A long-term holding period is one year or more with no expiration. Any investments that have a holding of less than one year will be short-term holds. The payment of dividends into an account will also have a holding period.

3.3.1 CALCULATING A HOLDING PERIOD

Starting on the day after the security's acquisition and continuing until the day of its disposal or sale, the holding period determines tax implications. For **example,** Sarah bought 100 shares of stock on Jan. 2, 2016. When determining her holding period, she begins counting on Jan. 3, 2016. The third day of each month after those counts as the start of a new month, regardless of how many days each month contains.

If Sarah sold her stock on December 23, 2016, she would realize a short-term capital gain or capital loss because her holding period is less than one year. If she sells her stock on Jan. 3, 2017, she would realize a long-term capital gain or loss because her holding period is more than one year.

3.3.2 DIFFERENT RULES DEFINING HOLDING PERIODS

When receiving a gift of appreciated stock or other security, the determination of the recipient's cost basis is by using the donor's basis. Also, the recipient's holding period includes the length of the donor's holding period. This continuation of holding is called "tacking on" because the recipient's holding period adds value to the donor's holding period. In cases where the recipient's basis is determined by the fair market value of the security, such as a gift of stock that decreased in value, the recipient's holding period starts on the day after receiving the gift.

When an investor receives a stock dividend, the holding period for the new shares, or portions of a new share, is the same as for the old shares. Meeting the minimum holding period is the primary requirement for dividends to be designated as qualified. For common stock, the holding must exceed 60 days throughout the 120-day period, which begins 60 days before the ex-dividend date. Preferred stock must have a holding period of at least 90 days during the 180-day period that begins 90 days before the stock's ex-dividend date.

Holding also applies when receiving new stock in a company spun off from the original company in which the investor purchased stock. For example, Paul purchased 100 shares of stock in April 2015. In June 2016, the company declared a two-for-one stock split. Paul then had 200 shares of company stock with the same holding period, starting with the date of purchase in April 2015.

3.4. CALCULATION OF EXPECTED RETURN

3.4.1 CONCEPET OF RETURN

3.4.1.1 Return on a Single Asset:-

Return has two components

Rate of return = Dividend yield + Capital gain yield

$$R_1 = \frac{\text{DIV}_1}{P_0} + \frac{P_1 - P_0}{P_0} = \frac{\text{DIV}_1 + (P_1 - P_0)}{P_0}$$

3.4.1.2 Average Rate of Return:-

The average rate of return is the sum of the various one-period rates of return divided by the number of period.

Formula for the average rate of return is as follows:

$$\bar{R} = \frac{1}{n}[R_1 + R_2 + \ldots + R_n] = \frac{1}{n}\sum_{t=1}^{n} R_t$$

3.4.2 Risk : Variance and Standard Deviation: -

Formulae for calculating variance and standard deviation

$$\text{Standard deviation} = \sqrt{\text{Variance}}$$

$$\textbf{Variance} = \sigma^2 = \frac{1}{n-1}\sum_{t=1}^{n}\left(R_t - \bar{R}\right)^2$$

If probabilities are given then variance: -

$$\sigma^2 = \left[R_1 - E(R^2)\right]P_1 + \left[R_2 - E(R^2)\right]P_2 + \ldots + \left[R_n - E(R^2)\right]P_n$$
$$= \sum_{i=1}^{n}\left[R_i - E(R^2)\right]P_i$$

3.5. RISK FACTORS

A. Business Risk: - The risk of doing business in a particular industry or environment is called business risk.

Fluctuations in operating income

Arise due to external & internal business factors

B. Financial Risk: -

associated with the capital structure of the firm

Variability of the income to the equity

A. BUSINESS RISK

Business risk is that portion of the unsystematic risk caused by the operating environment of the business. Business risk arises from the inability of a firm to maintain its competitive edge and the growth or stability of the earnings. Variation that occurs in the operating environment is reflected on the operating income and expected dividends. The variation in the expected operating income indicates the business risk.

For example take Anu and Vinu companies. In Anu company, operating income could grow as much as 15 per cent and as low as 7 per cent. In Vinu Company, the operating income can be either 12 per cent or 9 per cent. When both the companies are compared, Anu company's business risk is higher because of its high variability in operating income compared to Vinu company. Thus, business risk is concerned with the difference between revenue and earnings before interest and tax. Business risk can be divided into external business is and internal business risk.

a)Internal Business Risk

Internal business risk is associated with the operational efficiency of the firm. The operational efficiency differs from company to company. The efficiency of operation is reflected on the company's achievement of its pre-set goals: and the fulfillment of the promises to its inventors.

(1) Fluctuations in the sales the sales level has to be maintained. It is common in business to lose customers abruptly because of competition. Loss of customers will lead to a loss in operational income. Hence, the company has to build a wide customer base through various distribution channels. Diversified sales force may help to tide over this problem.

(2)Research and development (R&D) Sometimes the product may go out of style or become obsolescent. It is the management, who has to overcome the problem of obsolescence by concentrating on the in-house research and development program.

For example, if Maruti Udyog has to survive the competition, it has to keep its Research and Development section active and introduce consumer oriented technological changes in the automobile sector. This is often carried out by introducing sleekness, seating comfort and break efficiency in their automobiles. New products have to be produced to replace the

old one. Short sighted cuttin[g] of R and D budget would reduce the operational efficiency of any firm.

(3) ***Personnel management*** The personnel management of the company also contributes to the operational efficiency of the firm. Frequent strikes and lock outs result in loss of production and high fixed capital cost. The labour productivity also would suffer. The risk of labour management is present in all the firms.

(4) ***Fixed cost*** The cost components also generate internal risk if the fixed cost is higher in the cost component. During the period of recession or low demand for product, the company cannot reduce the fixed cost. At the same time in the boom period also the fixed factor cannot vary immediately. Thus, the high fixed cost component in a firm would become a burden to the firm.

(5) ***Single product*** The internal business risk is higher in the case of firm producing a single product. The fall in the demand for a single product would be fatal for the firm. Further, some products are more vulnerable to the business cycle while sonic products resist and grow against the tide. Hence, the company has to diversify the products if it has to face the competition and the business cycle successfully. Take for instance, Hindustan Lever Ltd., which is producing a wide range of consumer cosmetics is thriving successfully in the business. Even in diversification, diversifying the product in the unknown path of the company may lead to an internal risk. Unwieldy diversification is as dangerous as producing a single good.

B) EXTERNAL RISK

External risk is the result of operating conditions imposed on the firm by circumstances beyond its control. The external environments in which it operates exert some pressure on the firm. The external factors are social and regulatory factors, monetary and fiscal policies of the government, business cycle and the general economic environment within which a firm or an industry operates. A government policy that favors a particular industry could result in the rise in the stock price of the particular industry. For instance, the Indian sugar and fertilizer industry depend much on external factors.

1. Social and regulatory factors Harsh regulatory climate and legislation against the environmental degradation may impair the profitability of the industry. Price control, volume control, import/export control and environment control reduce the profitability of the firm. This risk is more in industries related to public utility sectors such as telecom, banking and transportation.

2. Political risk Political risk arises out of the change in the government policy. With a change in the ruling party, the policy also changes. When Sri. Manmohan Singh was the finance minister, liberalization policy was introduced. During the Bharathiya Janata government, even though efforts are taken to augment the foreign investment, more stress is given to Swdeshi. Political risk arises mainly in the case of foreign investment.

3. Business cycle: The fluctuations of the business cycle lead to fluctuations in the earnings of the company. Recession in the economy leads to a drop in the output of many

industries. Steel and white consumer goods industries tend to move in tandem with the business cycle. During the boom period, there would be hectic demand for steel products and white consumer goods. But at the same time, they would be hit much during the recession period. At present, the information technology industry has resisted the business cycle and moved counter cyclically during the recession period. The effects of the business cycle vary from one company to another. Sometimes, companies with inadequate capital and consumer base may be forced to close down. In some other case, there may be a fail in the profit and the growth rate may decline. This risk factor is external to the corporate bodies and they may not be able to control it.

B.FINANCIAL RISK

It refers to the variability of the income to the equity capital due to the debt capital. Financial risk in a company is associated with the capital structure of the company. Capital structure of the company consists of equity funds and borrowed funds. The presence of debt and preference capital results in a commitment of

paying interest or pre fixed rate of dividend. The residual income alone would be available to the equity holders. The interest payment affects the payments that are due to the equity investors. The debt financing increases the variability of the returns to the common stock holders and affects their expectations regarding the return. The use of debt with the owned funds to increase the return to the shareholders is known as financial leverage.

Debt financing enables the corporate to have funds at a low cost and financial leverage to the shareholders. As long as the earnings of a company are hi[g]her than the cost of borrowed funds, shareholders' earnings are increased. At the same time when the earnings are low, it may lead to bankruptcy to equity holders.

3.6. RISK CLASSIFICATION (OR) TYPES OF RISK

The investment risk is categorized into two. They are

Total Risk= Systematic+ Unsystematic

Total Risk= Market Risk+ specific Risk

Total Risk= Uncontrollable + Controllable

Total Risk= External Risk + Internal Risk

3.6.1 SYSTEMATIC RISK: Systematic risk arises on account of the economy-wide uncertainties and the tendency of individual securities to move together with changes in

the market. This part of risk cannot be reduced through diversification. It is also known as market risk.

3.6.1.1 Types of Systematic Risk

1) **Market Risk:** The variability in a security's returns resulting from fluctuations in the aggregate market is known as market risk. All securities are exposed to market risk including recessions, wars, structural changes in the economy, tax law changes and even changes in consumer preferences. Market risk is sometimes synonymously with systematic risk.
2) **Interest Rate Risk:** The variability in a security's returns resulting from changes in the level of interest rates is referred to as interest rate risk. Such changes generally affect securities inversely; i.e., other things being equal, security prices move inversely to interest rates. The reason for this movement is tied up with the valuation of securities. Interest rate risk affects bonds more directly than common stocks and is a major risk that all bondholders face. As interest rates change, bond prices change in the opposite direction.
3) **Purchasing Power Risk:** A factor affecting all securities is purchasing power risk, also known as inflation risk. This is the possibility that the purchasing power of invested dollars will decline. With uncertain inflation, the real (inflation - adjusted) return involves risk even if the nominal return is safe (e.g., a treasury bond). This risk is related to interest rate risk, since interest rates generally rise as inflation increases, because lenders demand additional inflation premiums to compensate for the loss of purchasing power.
4) **Regulation Risk:** Some investments can be relatively attractive to other investments because of certain regulations o tax laws that give them an advantage of some of kind. Municipal bonds, for example, pay interest that is exempt from local, state and federal taxation. As a result of that special tax exemption, municipals can price bonds to yield a lower interest rate since the net after – tax yield may still make them attractive to investors.
    a. The risk of regulatory change that adversely affect the structure of an investment is a real danger.

5) **Bull - Bear Market Risk:** This risk arises from the variability in the market returns resulting from alternating bull and bear market forces. When security index rises fairly consistently from a low point, called a trough, over a period of time, this upward trend is called a bull market. The bull market ends when the market index reaches a peak and starts a down ward trend. The period during which the market declines to the next trough is called a bear market.
6) **International Risk:** It includes the following risks.
    - **Exchange Rate Risk:** all investors who invest internationally in today's increasingly global investment arena face the prospect of uncertainty in the returns after they convert the foreign gains back to their own currency,un like the past, when most US investors ignored international investing

alternatives, invertors today must recognize and understand exchange rate risk, which can be defined as the variability in returns on securities caused by currency fluctuations exchange rate risk is sometimes called currency risk.

- **Country Risk:** Country risk, also referred to as political risk. It arises from the exploitation of a politically weak group for the benefit of politically strong group. Now a day's the FDI's are becomes very famous because of globalization.
- **Liquidity Risk:** it is associated with the particular secondary market in which a security trade. An investment can be bought or sold quickly and without and without significant price concession is considered liquid. The more uncertainty about the time element and the price concession, the greater the liquidity risks. A Treasury bill has little or no liquidity risk, where as a small OTC stock may have substantial liquidity risk.

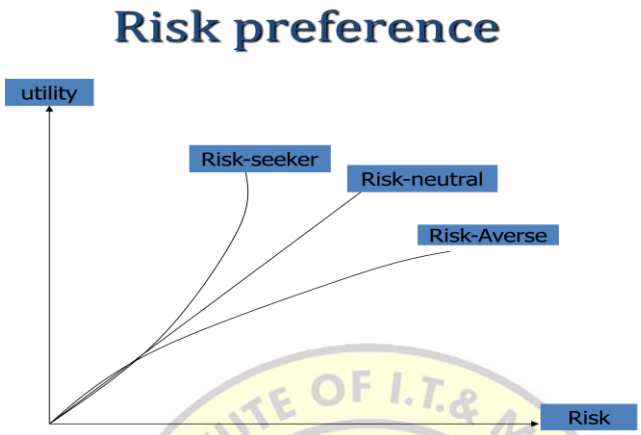
3.6.1.1.1 FACTORS WHICH INFLUENCE SYSTEMATIC RISK:

- Government Policies
- Inflation
- Interest Rates
- Foreign Exchange Fluctuations
- Political changes
- Economic Conditions

3.6.2. UN – SYSTEMATIC RISK: Unsystematic risk arises from the unique uncertainties of individual securities. It is also called unique risk. Unsystematic risk can be totally reduced through diversification.

As already mentioned, unsystematic risk is unique and peculiar to a firm or an industry. Unsystematic risk stems from managerial inefficiency, technological change in the production process, availability of raw material, changes in the consumer preference, end labour problems. The nature and magnitude of the above mentioned factors differ from industry to industry, and company to company. They have to be analyzed separately for each industry and firm. The changes in the consumer preference affect the consumer products like television sets, washing. Machines, refrigerators, etc. more than they affect the iron and steel industry. Technological changes affect the information technology industry more than that of consumer product industry. Thus, it differs from industry to industry. Financial leverage of the companies that is debt-equity portion of the companies differs from each other. The nature and mode of raising finance and paying back the loans, involve a risk element. All these factors form the unsystematic risk and contribute a portion in the total variability of the return. Broadly, unsystematic risk can be classified into:

Risk preference



- A *risk-averse* investor will choose among investments with the equal rates of return, the investment with lowest standard deviation. Similarly, if investments have equal risk (standard deviations), the investor would prefer the one with higher return.
- A risk-neutral investor does not consider risk, and would always prefer investments with higher returns.
- A risk-seeking investor likes investments with higher risk irrespective of the rates of return. In reality, most (if not all) investors are risk-averse.

3.6.2.1 FACTORS WHICH INFLUENCE UN SYSTEMATIC RISK

- Managerial inefficiency
- Technical Change
- Inefficiency of R&D
- Availability of R/M
- Changes in consumer preferences

Examples of un systematic risk

1. The company workers declare strike.
2. The R&D expert leaves the company.
3. A formidable competitor enters into market.
4. The company losses a big contract.
5. The company makes a breakthrough in process innovation.
6. The government increases custom duty on the material used by the company.

7. The company is unable to obtain adequate quantity of raw material.

3.7. STANDARD DEVIATION: -

Formulae for calculating variance and standard deviation

$$\text{Standard deviation} = \sqrt{\text{Variance}}$$

3.8. VARIANCE = $\sigma^2 = \frac{1}{n-1}\sum_{t=1}^{n}\left(R_t - \bar{R}\right)^2$

If probabilities are given then variance: -

$$\sigma^2 = \left[R_1 - E\left(R^2\right)\right]P_1 + \left[R_2 - E\left(R^2\right)\right]P_2 + \ldots + \left[R_n - E\left(R^2\right)\right]P_n$$
$$= \sum_{i=1}^{n}\left[R_i - E\left(R^2\right)\right]P_i$$

3.8.1 RISK AND RETURN: PORTFOLIO

- *A* **portfolio** is a bundle or a combination of individual assets or securities.
- The **portfolio Theory** provides a normative approach to investors to make decisions to invest their wealth in assets or securities under risk.
- It is based on the assumption that investors are risk-averse.
- The second assumption of the portfolio Theory is that the returns of assets are normally distributed.
- The **return of a portfolio** is equal to the weighted average of the returns of individual assets (or securities) in the portfolio with weights being equal to the proportion of investment value in each asset

  Expected return on portfolio = weight of security X × expected return on security X
  + weight of security Y × expected return on security Y

3.8.2 PORTFOLIO RISK TWO-ASSET CASE: -

The portfolio variance (or) standard deviation depends on covariance or correlation.

4.8.3 COVARIANCE: -

- The portfolio variance or standard deviation depends on the co-movement of returns on two assets. Covariance of returns on two assets measures their co-movement.
- Calculation of Covariance involves following steps:
  1. Determine the expected returns on assets.
  2. Determine the deviation of possible returns from the expected return for each asset (Ri —$\bar{R}$).
  3. Determine the sum of the product of each deviation of returns of two assets and respective probabilities (Ri —$\bar{R}$) Pi.

4. The formula for calculating covariance of returns of the two securities X and Y is as follows:

$$COV_{xy} = \sum_{i=1}^{n} [Rx - E(Rx)][Ry - E(Ry)] * Pi$$

- **Positive covariance:** X's and Y's returns both either above or below the average returns at the same time. This implies positive relation between two securities.
- **Negative covariance:** X's returns could be above its average return while Y's returns could be below its average returns and vice versa. This implies negative relation between two securities.
- **Zero covariance:** returns of X and Y have no relation. Returns on X and Y have no pattern.

3.8.4 CORRELATION: -

- **Correlation** is a measure of linear relationship between two variables (say, returns of two securities, X and Y).

$$Cor_{xy} = \frac{COV\ xy}{\sigma_x * \sigma_y}$$

- The value of correlation, called the **correlation coefficient.** The correlation coefficient always ranges between -1.0 and +1.0.A correlation coefficient of +1.0 implies a **perfectly positive correlation** while a correlation coefficient -1.0 implies a **perfectly negative correlation.** The correlation coefficient is zero if securities are not at all related to each other.
- When correlation coefficient of returns on individual securities is perfectly positive (i.e., cor = 1.0), then there is no advantage of diversification.
- The weighted standard deviation of returns on individual securities is equal to the standard deviation of the portfolio.
- We may therefore conclude that diversification always reduces risk provided the correlation coefficient is less than 1.
- The variance of two-security portfolio is given by the following equation:

$$\sigma_p^2 = \sigma_x^2 w_x^2 + \sigma_y^2 w_y^2 + 2 w_x w_y \, Covar_{xy}$$
$$= \sigma_x^2 w_x^2 + \sigma_y^2 w_y^2 + 2 w_x w_y \sigma_x \sigma_y \, Cor_{xy}$$

3.8.5 Minimum Variance Portfolio: -

Minimum variance portfolio explains" what is the best combination of two securities so that portfolio variance is minimum".

$$w^* = \frac{\sigma_y^2 - Cov_{xy}}{\sigma_x^2 + \sigma_y^2 - 2Cov_{xy}}$$

w^* is the optimum proportion of investment in security X.
Investment in Y will be: $1 - w^*$.

The sunrise & sunset companies have the following probability distribution of returns

Economic conditions	probability	companies	
		Sunrise	Sunset
High growth	0.1	32	30
Normal growth	0.2	20	17
Slow growth	0.4	14	6
Stagnation	0.2	-5	-17
Decline	0.1	-10	-16

You are required to calculate

a) To determine the expected cov of returns
b) Calculate correlation of returns b/w the Sunrise and Sunset companies

Economic condition	probability	Sunrise	Sunset	RSR · P	RSt · P
H.g	0.1	32	30	0.1X32 = 3.2	0.1X30 = 3
N.g	0.2	20	17	4.0	3.4
S.g	0.4	14	6	5.6	2.4
Stangnation	0.2	-5	-12	-1	-2.4
decline	0.1	-10	-16	-1	-1.6
				ΣRSXpi = 10.8	Σpst Xpi = 4.8

probability	Rx Sunrise	Ry Sunset	$(Rx - \Sigma(Rx))[Ry - \Sigma(Ry)] \times Pi$
0.1	32	30	[32-10.8][30-4.8] X0.1 = 53.42
0.2	20	17	[20-10.8][17-4.8] X0.2 = 22.44
0.4	14	6	[14-10.8][6-4.8] X0.4 = 1.536
0.2	-5	-12	[-5-10.8][-12-4.8] X0.2 = 53.09
0.1	-10	-16	[-10-10.8][-16-4.8] X0.1 = 43.26
			173.76

$$\sigma_x = \sqrt{\sum_{i=1}^{4} [Rx - E(Rx)]^2 \cdot pi}$$

$$= \sqrt{(32-10.8)^2 \times 0.1 + (20-10.8)^2 \times 0.2 + (14-10.8)^2 \times 0.4 + (5-10.8)^2 \times 0.2 + (-10-10.8)^2 \times 0.1}$$

$$= \sqrt{44.94 + 16.93 + 4.09 + 49.93 + 43.26}$$

$$= \sqrt{159.16}$$

$$= 12.62$$

$$\sigma_y = \sqrt{\sum_{i=1}^{4} [Ry - E(Ry)]^2 \cdot pi}$$

$$= \sqrt{(30-4.8)^2 \times 0.1 + (17-4.8)^2 \times 0.2 + (6-4.8)^2 \times 0.4 + (-12-4.8)^2 \times 0.2 + (-16-4.8)^2 \times 0.1}$$

$$= \sqrt{63.50 + 29.76 + 0.576 + 56.44 + 43.26}$$

$$= \sqrt{193.53}$$

$$= 13.92$$

$$\text{corr}_{xy} = \frac{\text{cov}_{xy}}{\sigma_x \cdot \sigma_y} = \frac{173.76}{[12.62][13.92]} = 0.99$$

Calculate β, Alpha, residual value and correlation

III-unit

years	Returns on IBM (Y)	Returns on BSE sensex (X)
1	0.2	0.1
2	0.3	0.2
3	0.5	0.3
4	0.4	0.4
5	0.6	0.5

Years	Return on IBM (Y)	Return on BSE (X)	XY	X^2	Y^2
1	0.2	0.1	0.02	0.01	0.04
2	0.3	0.2	0.06	0.04	0.09
3	0.5	0.3	0.15	0.09	0.25
4	0.4	0.4	0.16	0.16	0.16
5	0.6	0.5	0.3	0.25	0.36
	$\Sigma Y = 2$	$\Sigma X = 1.5$	$\Sigma XY = 0.69$	$\Sigma X^2 = 0.55$	$\Sigma Y^2 = 0.9$

1) Beta (β) $= \dfrac{n\Sigma XY - (\Sigma X)(\Sigma Y)}{n\Sigma X^2 - (\Sigma X^2)^2}$

$= \dfrac{5(0.69) - (1.5)(2)}{5(0.55) - (0.55)^2}$

$= \dfrac{3.45 - 3}{2.75 - 0.3025}$

$= \dfrac{0.45}{2.448}$

$= 0.184$

2) Alpha (α) $= \bar{y} - \beta\bar{x}$

$\bar{y} = \dfrac{\Sigma y}{n} = \dfrac{2}{5} = 0.4$

$\bar{x} = \dfrac{\Sigma x}{n} = \dfrac{1.5}{5} = 0.3$

$\alpha = 0.4 - 0.1846 \times 0.3$

$= 0.4 - 0.054$

$= 0.346$

3) Residual variance $(e^2) = \dfrac{\Sigma y^2 - \alpha \Sigma y - \beta \Sigma xy}{n}$

$= \dfrac{0.9 - (0.346)(2) - (0.184)(0.69)}{5}$

$= \dfrac{0.9 - 0692 - 0.127}{5} = \dfrac{0.9 - 0.819}{5}$

$= \dfrac{0.081}{5} = 0.0162$

4) correlation $= \dfrac{n\Sigma xy - (\Sigma x)(\Sigma y)}{\sqrt{n\Sigma x^2 - (\Sigma x)^2}\sqrt{n\Sigma y^2 - (\Sigma y)^2}}$

$= \dfrac{5(0.69) - (1.5)(2)}{\sqrt{5(0.55) - (0.55)^2}\sqrt{5(0.9) - (0.9)^2}}$

$= \dfrac{3.45 - 3}{\sqrt{2.75 - 0.3025}\sqrt{4.5 - 0.81}}$

$= \dfrac{0.45}{\sqrt{2.4475}\sqrt{3.69}}$

$= \dfrac{0.45}{1.5644 \times 1.9209}$

$= \dfrac{0.45}{3.005}$

$= 0.1498//$

Problems.

Model-I :—

1. The following table gives divident and share price data for XYZ company.

Year	Divendent per share	closing share price.
1994	2.50	12.25
1995	2.50	14.20
1996	2.50	17.50
1997	3.00	16.75
1998	3.00	18.45
1999	3.25	22.25
2000	3.50	23.50
2001	3.50	27.75
2002	3.50	25.50
2003	3.75	27.95
2004	3.75	31.50

You are Required to calculate:

1) The Annual Rate of Return.

2) The Expected Rate of Return (ARR)

(3) Variance

(4) Standard deviation of Returns (S.D)

Sol:-

$$R = \frac{D_1}{P_0} + \frac{P_1 - P_0}{P_0} \times 100.$$

(or)

$$R = \frac{D_1 + P_1 - P_0}{P_0} \times 100.$$

P_1 = closing price, P_0 = opening price.

D_1 = Divident.

Year	DPS	CPS	$R = \frac{D_1 + P_1 - P_0}{P_0} \times 100$
1994	2.50	12.25	—
1995	2.50	14.20	$R = \frac{2.50 + 12.25 - 14.20}{12.25} \times 100$ $R = 36.33$
1996	2.50	17.50	$R = \frac{2.50 + 17.50 - 14.20}{14.20} \times 100$ $R = 40.85$
1997	3.00	16.75	$R = \frac{3.00 + 16.75 - 17.50}{17.50} \times 100$ $R = 12.85$
1998	3.00	18.45	$R = \frac{3.00 + 18.45 - 16.75}{16.75} \times 100$ $R = 28.05$

1999	3.25	22.25	$R = \frac{3.25+22.25-18.45}{18.45} \times 100$ (2) $R = \frac{7.05}{18.45} \times 100 = 38.211$
2000	3.50	23.50	$R = \frac{3.50+23.50-22.25}{22.25} \times 100$ $R = 21.3$
2001	3.50	27.75	$R = \frac{3.50+27.75-23.50}{23.50} \times 100$ $R = 32.9$
2002	3.50	25.50	$R = \frac{3.50+25.50-27.75}{27.75} \times 100$ $R = 4.504$
2003	3.75	27.95	$R = \frac{3.75+27.95-25.50}{25.50} \times 100$ $R = 24.31$
2004	3.75	31.50	$R = \frac{3.75+31.50-27.95}{27.95} \times 100$ $R = 26.11$

*b) Expected Rate of Return

$$(\bar{R}) = \frac{1}{10}(36.33 + 40.85 + 12.85 + 28.05 + 38.2 + 21.3 + 32.9 + 4.50)$$

$$\bar{R} = \frac{1}{10}(265)$$

$$\bar{R} = \frac{265.52}{10}$$

$$\bar{R} = 26.55$$

c) variance $(\sigma^2) = \frac{1}{n-1} \sum_{i=1}^{n} (R_i - \bar{R})^2$

d) S.D $= \sqrt{\text{variance}}$

year	R_i	$(R_i - \bar{R})$	$(R_i - \bar{R})^2$
1994	—	—	—
1995	36.33	$(36.33 - 26.55) = 9.7$	$(9.7)^2 = 94.09$
1996	40.85	$(40.85 - 26.55) = 14.3$	$(14.3)^2 = 204.49$
1997	12.85	$(12.85 - 26.55) = -13.7$	$(-13.7)^2 = 187.69$
1998	28.05	$(28.05 - 26.55) = 1.5$	$(1.5)^2 = 2.25$
1999	38.2	$(38.2 - 26.55) = 11.66$	$(11.66)^2 = 135.9$

			③
2000	21.3	$(21.3 - 26.55) = -5.25$	$(-5.25)^2 = 27.56$
2001	32.9	$(32.9 - 26.55) = 6.35$	$(6.35)^2 = 40.32$
2002	4.50	$(4.50 - 26.55) = -22.05$	$(-22.05)^2 = 486.2$
2003	24.31	$(24.31 - 26.55) = -2.24$	$(-2.24)^2 = 5.01$
2004	26.11	$(26.11 - 26.55) = -0.44$	$(-0.44)^2 = 0.193$
			1183.703

$$\text{Variance } (\sigma^2) = \frac{1}{10-1}(1183.99)$$

$$= \frac{1183.99}{9}$$

$$= 131.55$$

$$\text{S.D } (\sigma) = \sqrt{131.55}$$

$$= 11.46$$

Model - 2 :—

1. Sunrise company Ltd has forecasted Returns on its shares with the following probability distribution.

Return (%)	probability.
−20	0.05
−10	0.05
−5	0.10
5	0.10
10	0.15
18	0.25
20	0.25
30	0.05

You are Required to calculate Expected Returns, variance and S.D of Requires for Sunrise company Ltd.

Sol:-

Expected Rate of Return

$$\bar{R} = \sum_{i=1}^{n} R_i * p_i$$

$$\text{Variance } (\sigma^2) = \sum_{i=1}^{n} [R_i - \bar{R}]^2 \cdot p_i$$

$$S.D = \sqrt{\text{variance}}$$

%	P	$R_i * p_i$	$(R_i - \bar{R})$	$(R_i - \bar{R})^2$	$(R_i - \bar{R})^2 * p_i$
-20	0.05	-1	$-20-11=-31$	$(-31)^2=961$	$961 \times 0.05 = 48.05$
-10	0.05	-0.5	$-10-(11)=-21$	$(-21)^2=441$	$441 \times 0.05 = 22.05$
-5	0.10	-0.5	$-5-11=-16$	$(-16)^2=256$	$256 \times 0.10 = 25.6$
5	0.10	0.5	$5-11=-6$	$(-6)^2=36$	$36 \times 0.10 = 3.6$
10	0.15	1.5	$10-11=-1$	$(-1)^2=1$	$1 \times 0.15 = 0.15$
18	0.25	4.5	$18-11=7$	$(7)^2=49$	$49 \times 0.25 = 12.25$
20	0.25	5	$20-11=9$	$(9)^2=81$	$81 \times 0.25 = 20.25$
30	0.25	1.5	$30-11=19$	$(19)^2=361$	$361 \times 0.05 = 18.05$
		$E(R)=11$		2186.	150.

$$= \sum_{i=1}^{n} (R_i - \bar{R})^2 * p_i$$

Variance = 150

$$S.D = \sqrt{\text{variance}} = \sqrt{150} = 12.24 //$$

i) $\overline{R} = -1 + (-0.5) + (-0.5) + 0.5 + 1.5 + 4.5 + 5 + 1.5$

$\overline{R} = 11$

— prepared by,
T. Reddy Niharika MBA
III, Sem (Sr).

UNIT-3 IMPORTANT QUESTIONS

1. Write a short note on:

a) **Revenue Return**
b) **Capital appreciation,**
c) **holding period,**

2. Explain Risk factors

3. Elucidate risk classification (or) types of Risk

Problems:

Calculation of expected return, standard deviation, variance and Beta

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR
(Established by Govt. of A.P., ACT No.30 of 2008)
ANANTHAPURAMU – 515 002 (A.P) INDIA

MASTER OF BUSINESS ADMINISTRATION
MBA; MBA (General Management); MBA (Business Management)
COMMON COURSE STRUCTURE & SYLLABI

Course Code	**Specialization Elective- III**	**L**	**T**	**P**	**C**
21E00305a	**Investment And Portfolio Management**	**4**	**0**	**0**	**4**
	Semester	**III**			

Course Objectives:

- To present and discuss an overview of stock markets.
- To explain concept of investment, process of investment.
- To discuss framework of fundamental and technical analysis under security analysis
- To impart knowledge on estimation and measurement of risk and return.
- To explain process of valuation of different securities.
- To describe the process of portfolio management process, theories, models to measure the performance of portfolio.

Course Outcomes (CO): Student will be able to

- Understand the overview of stock markets.
- Acquire knowledge on process of investment,
- Analyse the security under different types before investing in stocks.
- Ascertain risk and return value of different securities and portfolio
- Learn various portfolio theories, models to manage portfolio and maximise the portfolio returns.

UNIT – I	Lecture Hrs: 8

Investment: Introduction to stock markets - objectives, Process of Investment, Investment and speculation.

UNIT – II	Lecture Hrs: 12

Fundamental Analysis & Technical Analysis: Framework of Fundamental analysis- Economic analysis, Industry analysis-Industry Life cycle - Company analysis, Fundamental Analysis Vs Technical Analysis - Dow Theory.

UNIT - III	Lecture Hrs:12

Measurement of Risk and Return: Revenue Return and Capital appreciation, holding period – Calculation of expected return, Risk factors, risk classification – systematic risk – unsystematic risk – standard deviation – variance– Beta .

UNIT – IV	Lecture Hrs:12

Valuation of Securities: Types of Securities - Approaches of valuation – Bond valuation – Preference share Valuation – Common stock Valuation

UNIT – V	Lecture Hrs:12

Portfolio Management: Process of Portfolio Management, Modern Portfolio – Portfolio models – Markowitz model – Sharpe single index model, Capital Asset Pricing Models.

Textbooks:

1. Investment Management,V.K.Balla, S.Chand Company Ltd
2. Security Analysis and Portfolio Management ,Punithavathy Pandian, Vikas

Reference Books:

- Investment Analysis and portfolio management, Chandra, Tata McGraw Hill .
- Secuerity Analysis Portfolio Management, Ranganatham & Madhumathi, Pearson Education.
- Security Analysis and Portfolio Management, Sudhindra Bhat, excel.
- Security analysis and portfolio management, Avadani, Himalaya publishers.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR
(Established by Govt. of A.P., ACT No.30 of 2008)
ANANTHAPURAMU – 515 002 (A.P) INDIA

MASTER OF BUSINESS ADMINISTRATION
MBA; MBA (General Management); MBA (Business Management)
COMMON COURSE STRUCTURE

- Investment analysis portfolio management, Frank Reilly & Brown, Cengage.
- Investment Management, Preethi Singh, Himalaya Publishing House, Mumbai..
- Investment, Bodie, McGraw Hill Book Company.
- Investment Management ,Hiriyappa ,New Age Publications

Online Learning Resources:

https://www.bcci.bg/projects/latvia/pdf/8_IAPM_final.pdf
https://backup.pondiuni.edu.in/sites/default/files/investment%26portfolio-260214.pdf
https://sist.sathyabama.ac.in/sist_coursematerial/uploads/SBAA7002.pdf
https://www.youtube.com/c/iit/search?query=securities%20and%20portfolio%20management

UNIT-4
VALUATION OF SECURITIES

4. VALUATION OF SECURITIES:

Valuation of Financial Securities, Instruments & Derivatives. Securities Valuation means determining the market value of equity instruments (viz. common stock and preferred stock), debt instruments (viz. ... options and futures) issued by government agencies, financial institutions and corporate organizations**.** The main factors driving the securities market value include liquidity, demand and supply of similar instruments, stock market rates of similar securities, present value of future cash flows etc

4.1 TYPES OF SECURITIES

a) **Equity shares (or) Common shares:** Represent ownership in a company and a claim (dividends) on a portion of profits. Investors get one vote per share to elect the board members, who oversee the major decisions made by management. Over the long term, common stock, by means of capital growth, yields higher returns than almost every other investment. This higher return comes at a cost since common stocks entail the most risk. If a company goes bankrupt and liquidates, the common shareholders will not receive money until the creditors, and preferred shareholders are paid.

b) **Preferred share** represents some degree of ownership in a company but usually doesn't come with the same voting rights. (This may vary depending on the company.) With preferred shares investors are usually guaranteed a fixed dividend forever. This is different than common stock, which has variable dividends that are never guaranteed. Another advantage is that in the event of liquidation preferred shareholders are paid off before the common shareholder (but still after debt holders). Preferred stock may also be callable, meaning that the company has the option to purchase the shares from shareholders at any time for any reason (usually for a premium). Some people consider preferred stock to be more like debt than equity.

c) **Bond-** an issued security establishing its holder's right to receive from the issuer of the bond, within the time period specified therein, its **value and** the interest fixed therein on this value or other property equivalent. The

bond may provide for other property rights of its holder, where this is not contrary to legislation.

d) **Debentures: A** debenture is a type of debt instrument that is not secured by physical assets or collateral. Debentures are backed only by the general creditworthiness and reputation of the issuer. Both corporations and governments frequently issue this type of bond to secure capital. Like other types of bonds, debentures are documented in an indenture.

e) Units of mutual funds: An investment programme funded by shareholders that trade in diversified holdings and is professionally managed. A mutual fund is a professionally managed investment fund that pools money from many investors to purchase securities. These investors may be retail or institutional in nature. Mutual funds have advantages and disadvantages compared to direct investing in individual securities.

4.2 APPROACHES OF VALUATION

4.2.1 Bond valuation
4.2.2 Preference share Valuation
4.2.3 Common stock Valuation.

4.2.1. BOND VALUATION

Bond valuation: In finance, a bond is an instrument of indebtedness of the bond issuer to the holders. The most common types of bonds include municipal bonds and corporate bonds. The bond is a debt security, under which the issuer owes the holders a debt and (depending on the terms of the bond) is obliged to pay them interest (the coupon) or to repay the principal at a later date, termed the maturity date. Interest is usually payable at fixed intervals (semiannual, annual, and sometimes monthly). Very often the bond is negotiable, that is, the ownership of the instrument can be transferred in the secondary market. This means that once the transfer agents at the bank medallion stamp the bond, it is highly liquid on the secondary market.

4.2.1.1 FEATURES OF BOND

1) **Principal:** Nominal, principal, par, or face amount is the amount on which the issuer pays interest, and which, most commonly, has to be repaid at the end of the term. Some structured bonds can have a redemption amount which is different from the face amount and can be linked to the performance of particular assets.

2) **Maturity:** The issuer has to repay the nominal amount on the maturity date. As long as all due payments have been made, the issuer has no further obligations to the bond holders after the maturity date. The length of time until the maturity date is often referred to as the term or tenure or maturity of a bond. The maturity can be any length of time, although debt securities with a term of less than one year are generally designated money market instruments rather than bonds. Most bonds have a term of up to 30 years. Some bonds have been issued with terms of 50 years or more, and historically there have been some issues with no maturity date (irredeemable). In the market for United States Treasury securities, there are three categories of bond maturities:

   - Short term (bills): maturities between one and five years;
   - Medium term (notes): maturities between six and twelve years;
   - Long term (bonds): maturities longer than twelve years.

3) **Coupon:** The coupon is the interest rate that the issuer pays to the holder. Usually this rate is fixed throughout the life of the bond. It can also vary with a money market index, such as LIBOR, or it can be even more exotic. The name "coupon" arose because in the past, paper bond certificates were issued which had coupons attached to them, one for each interest payment. On the due dates the bondholder would hand in the coupon to a bank in exchange for the interest payment. Interest can be paid at different frequencies: generally semi-annual, i.e. every 6 months, or annual. Bond issued by the Dutch East India Company in 1623

4) **Yield:** The yield is the rate of return received from investing in the bond. It usually refers either to The current yield, or running yield, which is simply the annual interest payment divided by the current market price of the bond (often the clean price).The yield to maturity, or redemption yield, which is a more useful measure of the return of the bond. This

takes into account the current market price, and the amount and timing of all remaining coupon payments and of the repayment due on maturity. It is equivalent to the internal rate of return of a bond.

5) **Credit quality:** The quality of the issue refers to the probability that the bondholders will receive the amounts promised at the due dates. This will depend on a wide range of factors. High-yield bonds are bonds that are rated below investment grade by the credit rating agencies. As these bonds are riskier than investment grade bonds, investors expect to earn a higher yield. These bonds are also called *junk bonds*.

6) **Market price:** The market price of a tradable bond will be influenced, amongst other factors, by the amounts, currency and timing of the interest payments and capital repayment due, the quality of the bond, and the available redemption yield of other comparable bonds which can be traded in the markets. The price can be quoted as clean or dirty. "Dirty" includes the present value of all future cash flows, including accrued interest, and is most often used in Europe. "Clean" does not include accrued interest, and is most often used.

4.2.1.2 TYPES OF BONDS

1) **Government Bonds:** ***Government*** can be issued by national governments as well as lower levels of government. At the national or federal level, these government bonds are known as “sovereign” debt, and are backed by the ability of a nation to tax its citizens and to print currency.

2) bonds: Municipal, also known as "munis" are bonds issued by state or local governments or by government agencies. These bonds are typically riskier than national government bonds; cities don't go bankrupt that often, but it can happen (for example in Detroit and Stockton, CA). The major advantage to munis for investors is that the returns are free from federal tax, and furthermore, state and local governments will often consider their debt non-taxable for residents, thus making some municipal

bonds completely tax free, sometimes called triple-tax free. Because of these tax savings, the yield on a muni is usually lower than that of an equivalent taxable bond. Depending on your personal situation, a muni can be a great investment on an after-tax basis.

3) **Corporate Bonds:** The other major issuers of bonds are corporations, and corporate bonds make up a large portion of the overall bond market. Large corporations have a great deal of flexibility as to how much debt they can issue: the limit is generally whatever the market will bear. A corporate bond is considered short-term corporate when the maturity is less than five years; intermediate is five to 12 years, and long-term is over 12 years.
4) **Convertible bonds:** Convertible bonds are debt issued by corporations that give the bondholder the option to convert the bonds into shares of common stock at a later date. The rate at which investors can convert bonds into stocks, that is, the number of shares an investor gets for each bond, is determined by a metric called the conversion rate. The conversion rate may be fixed or change over time depending on the terms of the offering.
5) **Callable bonds:** Callable bonds are bonds that can be redeemed by the issuer at some point prior to its maturity. If interest rates have declined since the company first issued the bond, the company is likely to want to refinance this debt at a lower rate of interest. In this case, the company calls its current bonds and reissues them at a lower rate of interest. Callable bonds typically have a higher interest rate to account for this added risk to investors. When homeowners refinance a mortgage, they are calling in their older debt for a new loan at better rates.
6) **Corporate Bonds**: A company can issue bonds just as it can issue stock. Large corporations have a lot of flexibility as to how much debt they can

issue: the limit is whatever the market will bear. Generally, a short-term corporate bond has a maturity of less than five years, intermediate is five to 12 years and long term is more than 12 years.

7) **Term Bonds**: **Term** are bonds from the same issue that share the same maturity dates. Term bonds that have a call feature can be redeemed at an earlier date than the other issued bonds. A call feature, or call provision, is an agreement that bond issuers make with buyers. This agreement is called an "indenture," which is the schedule and the price of redemptions, plus the maturity dates.

8) **Fixed rate bonds** have a coupon that remains constant throughout the life of the bond. A variation is stepped-coupon bonds, whose coupon increases during the life of the bond.
9) **Zero-coupon bonds:** Zero-coupon bonds (zeros) pay no regular interest. They are issued at a substantial discount to par value, so that the interest is effectively rolled up to maturity (and usually taxed as such). The bondholder receives the full principal amount on the redemption date. An example of zero coupon bonds is Series E savings bonds issued by the U.S. government.
10) **High-yield bonds:** High-yield bonds (junk bonds) are bonds that are rated below investment grade by the credit rating agencies. As these bonds are riskier than investment grade bonds, investors expect to earn a higher yield.
11) **Convertible bonds:** Convertible bonds let a bondholder exchange a bond to a number of shares of the issuer's common stock. These are known as hybrid securities, because they combine equity and debt features.
12) **Exchangeable bonds:** Exchangeable bonds allows for exchange to shares of a corporation other than the issuer.

13) **Bonds:** Bearer is an official certificate issued without a named holder. In other words, the person who has the paper certificate can claim the value of the bond. Often they are registered by a number to prevent counterfeiting, but may be traded like cash. Bearer bonds are very risky because they can be lost or stolen.
14) **Registered bonds:** Registered bond is a bond whose ownership (and any subsequent purchaser) is recorded by the issuer, or by a transfer agent. It is the alternative to a Bearer bond. Interest payments and the principal upon maturity are sent to the registered owner.
15) **Social impact bonds:** Social impact bonds are an agreement for public sector entities to pay back private investors after meeting verified improved social outcome goals that result in public sector savings from innovative social program pilot projects.

BALAJI INSTITUTE OF I.T.& MANAGEMENT
KADAPA
ENTER TO LEARN-LEAVE TO SERVE

4.3 METHODS OF BOND VALUATION:

tenure. Therefore, the present value of a bond can be calculated as below:

$$P = \sum_{t=1}^{n} \frac{C}{(1+r)^t} + \frac{M}{(1+r)^n}$$

where,
P = Value (in rupees),
n = Number of years,
C = Annual coupon/interest payment (in rupees),
r = Periodic required return rate,
M = Maturity value/Principal repayment at the end of n years
t = Time period when the payment is received.

Thus, the discounted present value of future cashflow constitutes the intrinsic value of the bond. The two components of present value of a bond are the present value of principal repayment and the present value of future interest payments. For the purpose of calculating present value of interest payments, the formula applicable for the present value of a regular annuity is used. The present value of the bond may be calculated as below:

$$P = C \times PVIFA_{r,n} + M \times PVIF_{r,n}$$

where,
PVIFA = Present value of interest annuity factor.
PVIF = Present value of interest factor at required rate for number of years.

For example, consider a 10 year, 12 percent coupon bond with a par value of ₹1,000. The required yield on this bond is 13 percent.

The cashflows for this bond are as follows:
1) 10 annual coupon payments of ₹120.
2) ₹1,000 principal repayment 10 years from now.

$$P = C \times PVIFA_{r,n} + M \times PVIF_{r,n}$$

where,
Value of bond (P) = ?
Annual coupon payment (C) = ₹120 (₹1,000 of 12%)
Number of years (n) = 10 years
Principal repayment at the end of 10 years/Maturity value (M) = ₹1,000

Periodic required return rate (r) = 13%

∴ The value of the bond is:

$$P = 120 \times PVIFA_{13\%,10yrs} + 1{,}000 \times PVIF_{13\%,10yrs}$$
$$= 120 \times 5.426 + 1000 \times 0.295 = 651.1 + 295 = ₹946.1$$

Example 1: Calculate the value of bond from the following data:

i) A bond par value is ₹1,000.
ii) It bears a coupon rate of 14%.
iii) The bond will mature after 5 years.
iv) The required rate of return on the bond is 13%.

Solution: $P = C \times PVIFA_{r,n} + M \times PVIF_{r,n}$

where,

Value of bond (P) = ?
Annual coupon payment (C) = ₹140 (₹1,000 of 14%)
Number of years (n) = 5 years
Principal repayment at the end of 5 years/Maturity value (M) = ₹1,000
Periodic required return rate (r) = 13%

∴ The value of bond is:

$$P = ₹140(PVIFA_{13\%,5yrs}) + ₹1{,}000(PVIF_{13\%,5yrs})$$
$$= ₹140 \times (3.517) + ₹1{,}000 \times (0.543) = ₹492.38 + ₹543$$
$$= ₹1{,}035.4$$

Example 2: Calculate the value of bond from the following data:

i) A bond par value is ₹1,000.
ii) It bears a coupon rate of 12%.
iii) Its maturity period is 3 years.
iv) The required rate of return on the bond is 10%.

Solution: $P = C \times PVIFA_{r,n} + M \times PVIF_{r,n}$

where,

Value of bond (P) = ?
Annual interest/coupon payment (C) = ₹120 (₹1,000 of 12%)
Number of years (n) = 3 years

Principal repayment at the end of 3 years/Maturity value (M) = ₹1,000
Periodic required return rate (r) = 10%

∴ The value of bond is:

Example 4: Calculate the present value of a bond from the following data:

i) A bond has a par value of ₹100 on which interest is payable semi-annually.
ii) It bears a coupon rate of 12 percent.
iii) The bond maturity period is after 8 years.
iv) The required rate of return on the bond is 14%.

Solution: $$P = \sum_{t=1}^{2n} \frac{C/2}{(1+r/2)^t} + \frac{M}{(1+r/2)^{2n}}$$

where,
Value of bond (P) = ?
Principal repayment at the end of 8 years/Maturity value (M) = ₹100
Semi-annually receipt of interest/coupon rate (C/2) = ₹6 (₹100 of 12%/2)
Semi-annually required rate of interest (r/2) = 7% (14%/2)
No. of periods (2n) = 16 years (8years×2)
Time period when the payment is received (t) = 16 years

∴ The value of bond is:

$$P = \sum_{t=1}^{2n} \frac{6}{(1+0.07)^{16}} + \frac{100}{(1+0.07)^{16}}$$

$$= ₹6 \times (PVIFA_{7\%,\ 16yrs}) + ₹100 \times (PVIF_{7\%,\ 16yrs})$$

$$= ₹6 \times (9.447) + ₹100 \times (0.339) = ₹90.6$$

Example 5: Calculate the value of the bond with semi-annual and annual interest from the following data:

i) A bond has a par value of ₹1,000.
ii) It bears a coupon rate of 10 percent.
iii) The bond maturity period is after 8 years.
iv) The required rate of return on the bond is 12%.
v) Payment of interest is semi-annually.

Solution: Interest paid semi-annually:

$$P = C(PVIFA_{r,\ n}) + M(PVIF_{r,\ n})$$

where,
Value of bond (P) = ?
Principal repayment at the end of 8 years (M) = ₹1,000
Semi-annually receipt of interest/coupon payment(C/2) = ₹50 (₹1,000 of 10%/2)

$P = ₹120\ (PVIFA_{10\%, 3\ yrs}) + ₹1{,}000\ (PVIF_{10\%, 3\ yrs})$
$= ₹120 \times (2.487) + 1{,}000 \times (0.751) = ₹298.44 + ₹751 = ₹1{,}049.44$

Example 3: Calculate the value of bond from the following data:
i) A bond par value is ₹100.
ii) It bears a coupon rate of 12%.
iii) It will mature after 8 years.
iv) The required rate of return on the bond is 14%.

Solution: $P = C \times PVIFA_{r,n} + M \times PVIF_{r,n}$

where,
Value of bond (P) = ?
Annual interest/coupon payment (C) = ₹12 (₹100 of 12%)
Number of years (n) = 8 years
Principal repayment at the end of 8 years/Maturity value (M) = ₹100
Periodic required return rate (r) = 14%

∴ The value of bond is:
$P = ₹12(PVIFA_{14\%, 8yrs}) + ₹100(PVIF_{14\%, 8yrs})$
$= ₹12 \times (4.639) + ₹100 \times (0.351) = ₹55.67 + ₹35.1 = ₹90.77$

Bond Value with Semi-Annual Interest

While most of the bonds state annual rate of interest, the payment is actually made on semi-annual basis. In such cases, following steps are taken to calculate the value of bond:

1) Semi-annual interest payment is calculated by dividing the annual interest payment, C, by 2.
2) The number of years to maturity are multiplied by 2 to get the total number of half-yearly period.
3) The discount rate is divided by 2 to get the appropriate discount rate of semi-annual period.

After making above modifications, the formula for valuing the bond with semi-annual interest is given as below:

$$P = \sum_{t=1}^{2n} \frac{C/2}{(1 + r/2)^t} + \frac{M}{(1 + r/2)^{2n}}$$

$$\text{or} = \frac{C}{2} \times PVIFA_{r/2,\ 2n} + M \times PVIF_{r/2,\ 2n}$$

Semi-annually required rate of interest (r/2) = 6% (12%/2)
No. of periods (2n) = 20 years (10years×2)
∴ The value of bond is:

$$P = ₹50(PVIFA_{6,20}) + 1{,}000(PVIF_{6,20})$$
$$= ₹50 \times 11.4699 + ₹1{,}000 \times 0.3118 = ₹885.3$$

Interest paid annually:

$$P = C(PVIFA_{r,n}) + M(PVIF_{r,n})$$

where,
Value of bond (P) = ?
Principal repayment at the end of 8 years/Maturity value (M) = ₹1,000
Annually receipt of interest/coupon payment(C) = ₹100 (₹1,000 of 10%)
Annually required rate of interest (r) = 12%
No. of periods (n) = 10 years

$$P = ₹100(PVIFA_{12,10}) + ₹1{,}000(PVIF_{12,10})$$
$$= ₹100 \times 5.6502 + ₹1{,}000 \times 0.3220 = ₹887.02$$

The investor would be willing to pay ₹887.02 for the bond.

4.2.5. Bond Yield

Yield is one of the most important terms related to a bond. Bonds are normally compared on the basis of their yields as their price vary significantly due to differences in cashflow and other features.
Following are the four main types of yields:

1) **Current Yield:** The current yield is obtained by dividing annual interest by market price of the bond and thus it relates annual coupon rate to the market price.

$$\text{Current Yield} = \frac{\text{Annual Interest } (I_n)}{\text{Market Price } (P_0)} \times 100$$

This concept does not take time value of money into account. It also does not take into account the actual purchase price and hence till the expiry period it cannot be used to calculate capital gain or loss.

Example 6: Calculate the current yield from the following data:
i) A bond with a par value of ₹1,000
ii) It bears a coupon rate of 12%.
iii) The bond maturity period is after 10 years.
iv) Its market price for selling is ₹950.

Solution: $\text{Current Yield} = \frac{\text{Annual Interest } (I_n)}{\text{Market Price } (P_0)} \times 100$

Where,

Annual interest (I_a) = ₹120 (₹1,000 of 12%)
Market price (P_0) = ₹950

$$\text{Current Yield} = \frac{120}{950} \times 100 = 0.1263 \text{ or } 12.63 \text{ percent}$$

2) **Yield to Maturity:** This value equates the present value of future cashflows to the price of the bond. Thus, it is the interest rate which fulfils the following equation:

$$P = \frac{C}{(1+r)} + \frac{C}{(1+r)^2} + \ldots + \frac{C}{(1+r)^n} + \frac{M}{(1+r)^n}$$

where,

P = Price of the bond
C = Annual interest/coupon rate (in rupees)
M = Maturity value (in rupees)
n = Number of years left to maturity
r = Rate of return/interest

The yield to maturity can also be calculated by using the alternative formula:

$$YTM = \frac{C + (F-P)/n}{0.4F + 0.6P} \quad \text{or} \quad P = \sum_{t=1}^{n} \frac{C}{(1+YTM)^t} + \frac{M}{(1+YTM)^n}$$

where,

C = Interest value/coupon rate F = Face value of bond

Example 7: Calculate the bond's yield-to-maturity from the following data:

i) Gupta purchased a bond with a ₹1,000 face value.
ii) It bears a coupon rate of 10%.
iii) The bond maturity period is 4 years.
iv) Mr. Gupta paid ₹1,032.40 for the bond.

Note: The bond makes annual interest/coupon payments, the first to be received one year from today.

Solution: A bond YTM is that interest rate that equates the bond's price to the discounted value of its promised cashflows. In this case:

$$P = \frac{C}{(1+r)} + \frac{C}{(1+r)^2} + \ldots + \frac{C}{(1+r)^n} + \frac{M}{(1+r)^n}$$

where,

Price of the bond (P) = ₹1,032.40
Annual interest/coupon rate (C) = 10%

Maturity value (M) = ₹1,100
Number of years left to maturity (n) = 4 years
Rate of interest (r) = ?

$$₹1{,}032.40 = \frac{₹\,100}{(1+r)} + \frac{₹100}{(1+r)^2} + \frac{₹\,100}{(1+r)^3} + \frac{₹\,1{,}100}{(1+r)^4}$$

Let us try a value of 9 percent for 'r'. The right hand side of the above expression becomes:

$100(PVIFA_{9\%,\ 4yrs}) + 1{,}000(PVIF_{9\%,\ 4yrs})$

$=100 \times (3.240) + 1{,}000 \times (0.708) = 324 + 708 = ₹1{,}032$

The value is very close to price of the bond.

Hence, Yield to Maturity (YTM) = 9%.

Alternatively,

$$YTM = \frac{C + (F - P)/n}{0.4F + 0.6P}$$

where,

Yield to Maturity (YTM) = ?
Interest value/coupon rate (C) = ₹100
Face value of bond (F) = ₹1,000
Price of the bond (P) = ₹1,032.40
Number of years left to maturity (n) = 4 years

$$YTM = \frac{100 + (1{,}000 - 1{,}032.40)/4}{0.4(1{,}000) + 0.6(1{,}032.40)} \quad YTM = 9\%$$

Difference between Current Yield and Yield to Maturity

These two concepts are similar if the bond sells at par or its face value. However, if the bond trades at discount then 'yield to maturity' will be greater than the 'current yield' while in case of the bond trading at premium, the converse would be true, i.e., current yield is greater than yield to maturity.

For example, if the bond sells for ₹1,052, the current yield is 9.5 per cent (₹100 ÷ ₹1,052) and the yield to maturity is 8 per cent. The yield to maturity is less in this case because the loss that the investor must suffer when the price of the bond declines from ₹1,052 to ₹1,000 at maturity has been included in the calculation.

The bigger the discount (or the smaller the premium), the greater are both the current yield and the yield to maturity. **For example,** when the bond sells for ₹850, the yield to maturity is 10.49 per cent, but it rises to 12.52 per cent when the price declines to ₹750.

Example 8: Calculate the Yield to Maturity (YTM) on the bond from the following data:

i) The market price of a par value bond is ₹1,000.
ii) It bears a coupon rate of 14%.
iii) Maturity period of the bond is after 5 years.
iv) The value of the bond is ₹1,050.

Solution: $$P = \sum_{t=1}^{n} \frac{C}{(1+r)^t} + \frac{M}{(1+r)^n}$$

where,

Value of bond (P) = ₹1,050
Annual interest/coupon payment (C) = ₹140 (₹1,000 of 14%)
Number of years (n) = 5 years
Time period when the payment is received (t) = 5 years
Principal repayment at the end of 5 years/Maturity value (M) = ₹1,000
Periodic required return rate (r) = ?

The YTM is the value of 'r' in the following equality:

$$1050 = \sum_{t=1}^{5} \frac{140}{(1+r)^t} + \frac{1,000}{(1+r)^5} = 140(PVIFA_{r,5yrs}) + 1,000(PVIF_{r,5yrs})$$

Let us try a value of 13% for 'r'. The right hand side of the above expression becomes:

$1,050 = 140(PVIFA_{13\%,5yrs}) + 1,000(PVIF_{13\%,5yrs})$
$= 140 \times (3.517) + 1,000 \times (0.543) = 492.4 + 543.0 = ₹1,035.4$

Since this is less than ₹1,050, we try a lower value for 'r'. Let us try r = 12%. This makes the right-hand side equal to:

$1,050 = 140(PVIFA_{12\%,5yrs}) + 1,000(PVIF_{12\%,5yrs})$
$= 140 \times (3.605) + 1,000 \times (0.567) = 504.7 + 567.0 = ₹1,071.7$

Thus, r lies between 12% and 13%. Using a linear interpolation in this range, we find that r is equal to:

$$12\% + (13\% - 12\%)\frac{1,071.7 - 1,050.0}{1,071.7 - 1,035.4} = 12.60\%$$

3) **Realised Yield to Maturity:** YTM calculation assumes that cashflows are re-invested at the rate of yield to maturity. However, in real life situations, the rate of interest receivable on such reinvestments may vary. In order to account for this anomaly,

4.2.2 PREFERENCE SHARE VALUATION

Preference shares are one of the important sources of hybrid financing. It is a hybrid security because it has some features of equity shares as well as some features of debentures. The holders of preference shares enjoy the preferential rights with regard to receiving of dividend and getting back of capital in case the company winds-up.

4.2.2.1 FEATURES OF PREFERENCE SHARES:

1. Preference shares are long-term source of finance.
2. The dividend payable on preference shares is generally higher than debenture interest.
3. Preference shareholders get fixed rate of dividend irrespective of the volume of profit.
4. It is known as hybrid security because it also bears some characteristics of debentures.
5. Preference dividend is not tax deductible expenditure.
6. Preference shareholders do not have any voting rights.
7. Preference shareholders have the preferential right for repayment of capital in case of winding up of The Company.
8. Preference shareholders also enjoy preferential right to receive dividend.

4.2.2.2 ADVANTAGES OF PREFERENCE SHARES:

a. The earnings per share of existing preference shareholders are not diluted if fresh preference shares are issued.

b. Issue of preference shares increases the earnings of equity shareholders, i.e. it has a leveraging benefit.
c. Preference shareholders do not have any voting rights and hence do not affect the decision mak-ing of the company.
d. Preference dividend is payable only if there is profit.

4.2.2.3 DISADVANTAGES OF PREFERENCE SHARES:

a. Preference dividend is not tax deductible and hence it is costlier than a debenture.
b. In case of cumulative preference share, arrear dividend is payable when the company earns profit, which creates a huge financial burden on the company.
c. Redemption of preference share again creates financial burden and erodes the capital base of the company.
d. Preference shareholders get dividend at a constant rate and it will not increase even if the com-pany earns a huge profit, which makes this form of finance less attractive.
e. Preference shareholders do not enjoy the voting rights and hence their fate is decided by the equity shareholders.

4.2.2.4 DIFFERENT TYPES OF PREFERENCE SHARES:

Preference share may be classified under following categories:

i. According to Redeem ability:

Redeemable Preference Shares: Redeemable preference shares are those shares which are redeemed or repaid after the expiry of a stipulated period. As per The Companies (Amendment) Act, 1988, a company can issue redeemable preference shares which are redeemable within 10 years from the date of issue.

Irredeemable Preference Shares: Irredeemable preference shares are those shares which are not redeemed before a stipulated period. It does not have a specific maturity date. Such shares are redeemed at the time of liquidation of the company. As per The Companies (Amendment) Act, 1988, a company at present cannot issue irredeemable preference shares.

ii. According to Right of Receiving Dividend:

a. Cumulative Preference Shares: Preference dividend is payable if the company earns adequate profit. However, cumulative preference shares carry additional features which allow the preference shareholders to claim unpaid dividends of the years in which dividend could not be paid due to insufficient profit.

b. Non-cumulative Preference Shares: The holders of non-cumulative preference shares will get preference dividend if the company earns sufficient profit but they do not have the right to claim unpaid dividend which could not be paid due to insufficient profit.

iii. According to Participation:

a. Participating Preference Shares: Participating preference shareholders are entitled to share the surplus profit of the company in addition to preference dividend. Surplus profit is calculated by deducting preference dividend and equity dividend from the distributable profit. They are also enti-tled to participate in the surplus assets of the company.

b. Non-participating Preference Shares: Non-participating preference shareholders are not entitled to share surplus profit and surplus assets like participating preference shareholders.

iv. According to Convertibility:

a. Convertible Preference Shares: The holders of convertible preference shares are given an option to convert whole or part of their holding into equity shares after a specific period of time.

b. Non-convertible Preference Shares: The holders of non-convertible preference shares do not have the option to convert their holding into equity shares i.e. they remain as preference share till their redemption.

4.2.2.5 METHODS PREFERENCE SHARE VALUATION

1. Value of Preference Shares
2. Yield on Preference Shares
3. Common Stock Valuation
4. Present Value Approach
5. One Year Holding Period
6. Multiple Years Holding Period
7. Constant Growth or Zero Growth Dividends
8. Growth in Dividends' Normal Growth

1. Value of Preference Shares: Preference shares give a fixed rate of dividend but without a maturity date. Preference shares are usually perpetuities but sometimes they do have maturity dates also.

The value of a preference share as a perpetuity is calculated thus:

V = Value of Preference Share

D = Annual Dividend per Preference Share

i = Discount Rate on Preference Shares

V = D/i

A company sold its preference shares @ Rs. 50 last year. The discount rate at that time was 8%. The company pays an annual dividend of Rs. 4. The type of Preference Share is currently yielding 6%. What is the value of the company's Preference Shares?

V = 4/.06 = 66.67

2. Yield on Preference Shares: The yield on Preference Shares is calculated in the following manner: D

i = D/V

... If current price of a preference share is Rs. 60 and annual dividend is Rs. 4, what is the yield on Preference Shares?

i = D/V = 4/60 = 6.67%

3. Common Stock Valuation: The valuation of Bonds and Preference Shares showed that the rate of dividend and interest is constant and reasonably certain. Bonds represent constant income flows with a finite measurable life and preference stocks have constant return on their shares. The valuation of common stocks is comparatively more difficult.

The difficulty arises because of two factors:

(1) The amount of dividend and timing of cash flows expected by investors are uncertain.

(2) The earnings and dividends on common shares are generally expected to grow. Valuation of shares based on dividends and earnings.

4. Present Value Approach: The value of a common stock at any moment in time can be thought of as the discounted value of a series of uncertain future dividends that may grow or decline at varying rates overtime — The Basic Valuation Model.

5. One Year Holding Period: Common Stock Valuation is easiest to start with when the expected holding period is one year. To the investor, the rewards from a common stock consist of dividends plus any change in price during the holding period.

Example 3:

An investor buys a share at the beginning of the year for Rs. 100. He holds the stock for one year. Rs. 5/- in dividends is collected and the share is sold for Rs. 130/-. The rate of return achieved is the composite of dividend yield and change in price (capital gains yield).

$$g = \frac{D_1 - D_0}{D_0} = \frac{(1-b)E_{0(1=br)}}{(1-b)E_0} - (1-b)E_0$$

$g=\frac{(1-b)E_0\,1+br++1}{(1-b)E_0}$ =br-(1)

The total rate of return achieved is .05 + 3 = .35 or 35%.

The same may be expressed in present values:

$P_0=\frac{D_1}{1+Ke}+\frac{P_1}{1+Ke}$

D_1 = Dividend to be received at the end of year one.

k_e = Investor's required rate of return or discount.

P_I = Selling Price at the end of year one.

P_0 = Selling price today.

Therefore, Rs. 100 = $\frac{5.00}{1+Ke}+\frac{130}{1+ke}$

At what price must we be able to sell the stock at the end of one year (if the purchase price is Rs. 100 and the dividend is Rs. 5/-) in order to attain a rate of return of 40%?

Rs=100 = $\frac{Rs.5}{1+40}+\frac{P_1}{1+40)}$

100=3.57+0.7 P_1

96.43=0.7 P_1

$P_1=\frac{96.43}{7}$

= 137.7(selling price)

6. Multiple Years Holding Period:

Suppose the buyer who purchases the share P holds it for 3 years and then sells.

$\frac{P_1}{(1+Ke)}\frac{D_2}{(1+Ke)^2}\frac{D_3}{(1+Ke)}\frac{D_4}{(1+Ke)^3}\frac{P_4}{(1+Ke)^4}$…….Equation

The value of the share to him today will be:

The price at the end of the fourth year and all future prices are determined in a similar manner.

The formula for determining the value of the share at the present time can be written as follows:

$$P_{0=}\frac{D_1}{(1+Ke)}+\frac{D_2}{(1+Ke)^2}+\ldots.+\frac{P_4}{(1+Ke)^n}$$

$$=N=1=\frac{D_1}{(1+r)^2}$$

It is obvious from the equation that the present value of the share is equal to the capitalized value of an infinite stream of dividends D_1 in the equation is expected dividend. The investors estimate the dividends per share likely to be paid by the company in future periods.

These estimates are based on subjective probability distributions. Thus, D_1 refers expected values or means of these distributions. Calculating the rate that will solve the equation is a tedious task requiring computation through trial and error method.

7. Constant Growth or Zero Growth Dividends:

If the dividends remain constant over a period of time, the Equation will be:

$P_0 = D/Ke$

Example: A company is paying a dividend of Rs. 6 per share every year in future. If the capitalization rate is 12%, calculate the price of share today. The constant growth model is often defended as a model which arises from the assumption that the firm will maintain a stable rate of return on new equity investments over a period of time.

The problem or posers in such a model are — How can it be used to select stocks? The method to do this is to predict the next year's dividends, the firm's long-term growth rate and the rate of return stockholders require for holding the stock.

A theoretical price of the stock could then be compared with its present price. Stocks that have theoretical prices above their actual prices would prefer to buy, those with theoretical prices below would prefer to sell.

8. Growth in Dividends' Normal Growth: Dividends cannot remain constant. The earnings and dividends of most companies increase over time because of their retention policies. The companies retain some portion of their earning for reinvestment in their own business. The policy would increase the common shareholder's equity as well as the firm's earnings. Therefore, the earnings per share will also increase and would produce higher dividends with the passage of time.

The growth in dividend is:

$$g = \frac{D_1 - D_0}{D_0} = \frac{(1-b)E_0(1+br) - (1-b)E_0}{(1-b)E_0}$$

$$g = \frac{(1-b)E_0\,1 + br + 1}{(1-b)E_0} = br \qquad (1)$$

4.2.3 COMMON STOCK VALUATION

Equity shares were earlier known as ordinary shares. The holders of these shares are the real owners of the company. They have a voting right in the meetings of holders of the company. They have a control over the working of the company. Equity shareholders are paid dividend after paying it to the preference shareholders.

The rate of dividend on these shares depends upon the profits of the company. They may be paid a higher rate of dividend or they may not get anything. These shareholders take more risk as compared to preference shareholders.

Equity capital is paid after meeting all other claims including that of preference shareholders. They take risk both regarding dividend and return of capital. Equity share capital cannot be redeemed during the life time of the company.
Features of Equity Shares:

4.2.3.1 FEATURES OF EQUITY SHARES:

1) Equity share capital remains permanently with the company. It is returned only when the company is wound up.
2) Equity shareholders have voting rights and elect the management of the company.
3) The rate of dividend on equity capital depends upon the availability of surplus funds. There is no fixed rate of dividend on equity capital.

4.2.3.2 ADVANTAGES OF EQUITY SHARES:

1) Equity shares do not create any obligation to pay a fixed rate of dividend.

2) Equity shares can be issued without creating any charge over the assets of the company.

3) It is a permanent source of capital and the company has to repay it except under liquidation.

4) Equity shareholders are the real owners of the company who have the voting rights.

5) In case of profits, equity shareholders are the real gainers by way of increased dividends and appreciation in the value of shares.

4.2.3.4 DISADVANTAGES OF EQUITY SHARES:

1. If only equity shares are issued, the company cannot take the advantage of trading on equity.
2. As equity capital cannot be redeemed, there is a danger of over capitalization.
3. Equity shareholders can put obstacles for management by manipulation and organizing themselves.
4. During prosperous periods higher dividends have to be paid leading to increase in the value of shares in the market and it leads to speculation.
5. Investors who desire to invest in safe securities with a fixed income have no attraction for such shares.

4.2.3.5 METHODS OF COMMON STOCK VALUATION

Method # 1. Based on Balance Sheet:

i. Book Value: It is the net worth of a company divided by number of outstanding shares. Net worth is equal to paid-up equity capital plus reserves and surplus minus losses.

ii. Liquidation Value: Liquidation value is different than a book valuation. In that it uses the value of the assets at liquidation, which is often less than market and sometimes book. Liabilities are deducted from the liquidation value of the assets to determine the liquidation value of the business. Liquidation value can be used to determine the bare bottom benchmark value of a business.

$$\text{Liquidation value} = \frac{\text{value realized per share from liquidating all the assets of the firm} - \text{Amount to be paid to all the creditors and preference shareholders}}{\text{No. of outstanding shares}}$$

iii. Replacement Cost: Replacement costs provide an alternative way of valuing a company's assets. The replacement, or current, cost of an asset is the amount of money required to replace the asset by purchasing a similar asset with identical future service capabilities. In replacement cost, assets and liabilities are valued at their cost to replace.

Method # 2. Based on Dividends:

i. One Year Holding Period: As per this model, the investor intends to purchase now, hold it for one year and sell it off at the end of one year. Thus, the investor would receive dividend of one year as well as the share price at the end of year one.

To value a stock, we have to first find the present discounted value of the expected cash flows.

$$Po = \frac{D1}{(1+ke)} + \frac{P1}{(1+ke)}$$

Where,
Po = the current price of the stock

D1 = the dividend paid at the end of year 1

ke = required return on equity investments (Discounting factor)

P1 = the price at the end of period one

Let ke = 12%, Div = 0.16 and P1 = Rs.60.

$$Po = \frac{0.16}{(1+0.12)} + \frac{60}{(1+0.12)}$$

Po = Rs. 53.71

If the stock was selling for Rs. 53.71 or less, the share should be purchased

ii. Multiple Year Holding Period: As per this model, an investor may hold the shares for a number of years and sell it off at the end of it. Thus, he receives dividends for these periods as well as market price of the share after it.

$$Po = \frac{D1}{(1+ke)^1} + \frac{D2}{(1+ke)^2} + \frac{D3}{(1+ke)^3} + \frac{Dn}{(1+ke)^n} + \frac{Pn}{(1+ke)^n}$$

Where,

Po = the current price of the stock

D1, D2, D3……. Dn = annual dividend paid at the end of year 1, 2, 3…n

ke = required return on equity investments (Discounting factor)

Pn = the price at the end of period n

For example:

If an investor expects to get Rs.3.5, Rs.4 and Rs.4.50 as dividend from a share during the next 3 years and hopes to sell it off at Rs.75 at the end of the third year, and if required rate of return is 15%, the present value of the share will be

$$Po = \frac{3.5}{(1+0.15)^1} + \frac{4}{(1+0.15)^2} + \frac{4.5}{(1+0.15)^3} + \frac{75}{(1+0.15)^3}$$

iii. Constant Growth Model (Gordon's Share Valuation Model):

As per this model, dividends will grow at the same rate (g) into the indefinite future and the discount rate (k) is greater than growth rate

$$Po = \frac{D1}{k-g} \quad \text{or} \quad Po = \frac{Do\,(1+g)}{k-g}$$

Where,

k = discount factor

g = growth rate

Do = current dividend

D1 = Dividend at end of year one

For example: Alembic Company has declared a dividend of Rs. 2.5 per share for the current year. The company has been following a policy of enhancing its dividends by 10% every year and is expected to continue its policy in future also. The investor's required rate of return is 15%. The value of the share will be

$$Po = \frac{2.5(1+0.1)}{(0.15-0.10)} = Rs.\ 55$$

iv. Multiple Growth Model (Also called as the Two Stage Growth Model):

The constant growth model has a very unrealistic assumption of constant growth. The growth may take place at varying rates. In the multiple growth model, the future time period is viewed as divisible into two different growth segments, the initial extraordinary growth period and the subsequent constant growth period.

Po = V1 + V2

V1 = value of first stage =

$$V_1 = \frac{D1}{(1+ke)^1} + \frac{D2}{(1+ke)^2} + \frac{D3}{(1+ke)^3} + \frac{Dn}{(1+ke)^n}$$

V2 = value of second stage =

$$V_2 = \frac{Dn(1+g)}{(k-g)\,1+ke)^n}$$

Where,

Po = the current price of the stock

D1, D2, D3……. Dn = annual dividend paid at the end of year 1, 2, 3…n

ke = required return on equity investments (Discounting factor)

g = constant growth rate of dividends at the start of the second stage

For example: Hindal &co paid a dividend of Rs.1.75 per share during the current year. It is expected to pay a dividend of Rs.2 per share during the next year. Investors forecast a dividend of Rs.3 and Rs.3.5 per share respectively during the two subsequent years. After that, it is expected that annual dividends would grow at 10% per year into an indefinite future. The investor's required rate of return is 20%.

$$V_1 = \frac{2}{(1+0.2)^1} + \frac{3}{(1+0.2)^2} + \frac{3.5}{(1+0.2)^3} = \text{Rs.}5.78$$

$$V_2 = \frac{3.5(1+0.10)}{(0.2-0.1)(1+0.2)^3} = \text{Rs.}22.28$$

Po = V1 + V2 = 5.78 + 22.28 = Rs. 28.06

Method # 3. Other Approaches:

i. Price to Book Value Ratio:

$$\text{Price to book value ratio} = \frac{\text{Stockprice per share}}{\text{Shareholder's equity per share}}$$

The book value of a company is the value of the net assets expressed in the balance sheet. Net assets mean total assets minus intangible assets and liabilities. This ratio gives the investor an idea of how much he is actually paying for the share.

ii. Earnings Multiplier Approach:

Under this approach, the value of equity share is estimated as follows:

Po = EPS × P/E ratio.

Where,

EPS = Earning Per share

P/E ratio = Price Earning Ratio

P/E ratio = Market price per share / earnings per share

iii. Price to Sales Ratio:

It is calculated by dividing a company's current stock price by its revenue per share for the recent twelve months. This ratio reflects what the market is willing to pay per rupee of sales.

iv. Market Value Method:

This method is used only in case of listed companies, since they have a market value.

Market value of a company = No. of shares outstanding × market price per share

UNIT-4 –IMPORTANT QUESTIONS

1) Briefly explain Approaches of valuation
2) Elucidate features and types of Bond valuation
3) Explain types of Preference share Valuation
4) Elucidate features and types of Common (equity) stock Valuation

Problems: Bond, Preference, Common stock Valuation

BALAJI INSTITUTE OF I.T & MANAGEMENT KADAPA ENTER TO LEARN-LEAVE TO SERVE

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR
(Established by Govt. of A.P., ACT No.30 of 2008)
ANANTHAPURAMU – 515 002 (A.P) INDIA

MASTER OF BUSINESS ADMINISTRATION
MBA; MBA (General Management); MBA (Business Management)
COMMON COURSE STRUCTURE & SYLLABI

Course Code	**Specialization Elective- III**	**L**	**T**	**P**	**C**
21E00305a	**Investment And Portfolio Management**	**4**	**0**	**0**	**4**
	Semester	**III**			

Course Objectives:

- To present and discuss an overview of stock markets.
- To explain concept of investment, process of investment.
- To discuss framework of fundamental and technical analysis under security analysis
- To impart knowledge on estimation and measurement of risk and return.
- To explain process of valuation of different securities.
- To describe the process of portfolio management process, theories, models to measure the performance of portfolio.

Course Outcomes (CO): Student will be able to

- Understand the overview of stock markets.
- Acquire knowledge on process of investment,
- Analyse the security under different types before investing in stocks.
- Ascertain risk and return value of different securities and portfolio
- Learn various portfolio theories, models to manage portfolio and maximise the portfolio returns.

UNIT – I	Lecture Hrs: 8

Investment: Introduction to stock markets - objectives, Process of Investment, Investment and speculation.

UNIT – II	Lecture Hrs: 12

Fundamental Analysis & Technical Analysis: Framework of Fundamental analysis- Economic analysis, Industry analysis-Industry Life cycle - Company analysis, Fundamental Analysis Vs Technical Analysis - Dow Theory.

UNIT - III	Lecture Hrs:12

Measurement of Risk and Return: Revenue Return and Capital appreciation, holding period – Calculation of expected return, Risk factors, risk classification – systematic risk – unsystematic risk – standard deviation – variance– Beta .

UNIT – IV	Lecture Hrs:12

Valuation of Securities: Types of Securities - Approaches of valuation – Bond valuation – Preference share Valuation – Common stock Valuation

UNIT – V	Lecture Hrs:12

Portfolio Management: Process of Portfolio Management, Modern Portfolio – Portfolio models – Markowitz model – Sharpe single index model, Capital Asset Pricing Models.

Textbooks:

1. Investment Management,V.K.Balla, S.Chand Company Ltd
2. Security Analysis and Portfolio Management ,Punithavathy Pandian, Vikas

Reference Books:

- Investment Analysis and portfolio management, Chandra, Tata McGraw Hill .
- Secuerity Analysis Portfolio Management, Ranganatham & Madhumathi, Pearson Education.
- Security Analysis and Portfolio Management, Sudhindra Bhat, excel.
- Security analysis and portfolio management, Avadani, Himalaya publishers.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR
(Established by Govt. of A.P., ACT No.30 of 2008)
ANANTHAPURAMU – 515 002 (A.P) INDIA

MASTER OF BUSINESS ADMINISTRATION
MBA; MBA (General Management); MBA (Business Management)
COMMON COURSE STRUCTURE

- Investment analysis portfolio management, Frank Reilly & Brown, Cengage.
- Investment Management, Preethi Singh, Himalaya Publishing House, Mumbai..
- Investment, Bodie, McGraw Hill Book Company.
- Investment Management ,Hiriyappa ,New Age Publications

Online Learning Resources:

https://www.bcci.bg/projects/latvia/pdf/8_IAPM_final.pdf
https://backup.pondiuni.edu.in/sites/default/files/investment%26portfolio-260214.pdf
https://sist.sathyabama.ac.in/sist_coursematerial/uploads/SBAA7002.pdf
https://www.youtube.com/c/iit/search?query=securities%20and%20portfolio%20management

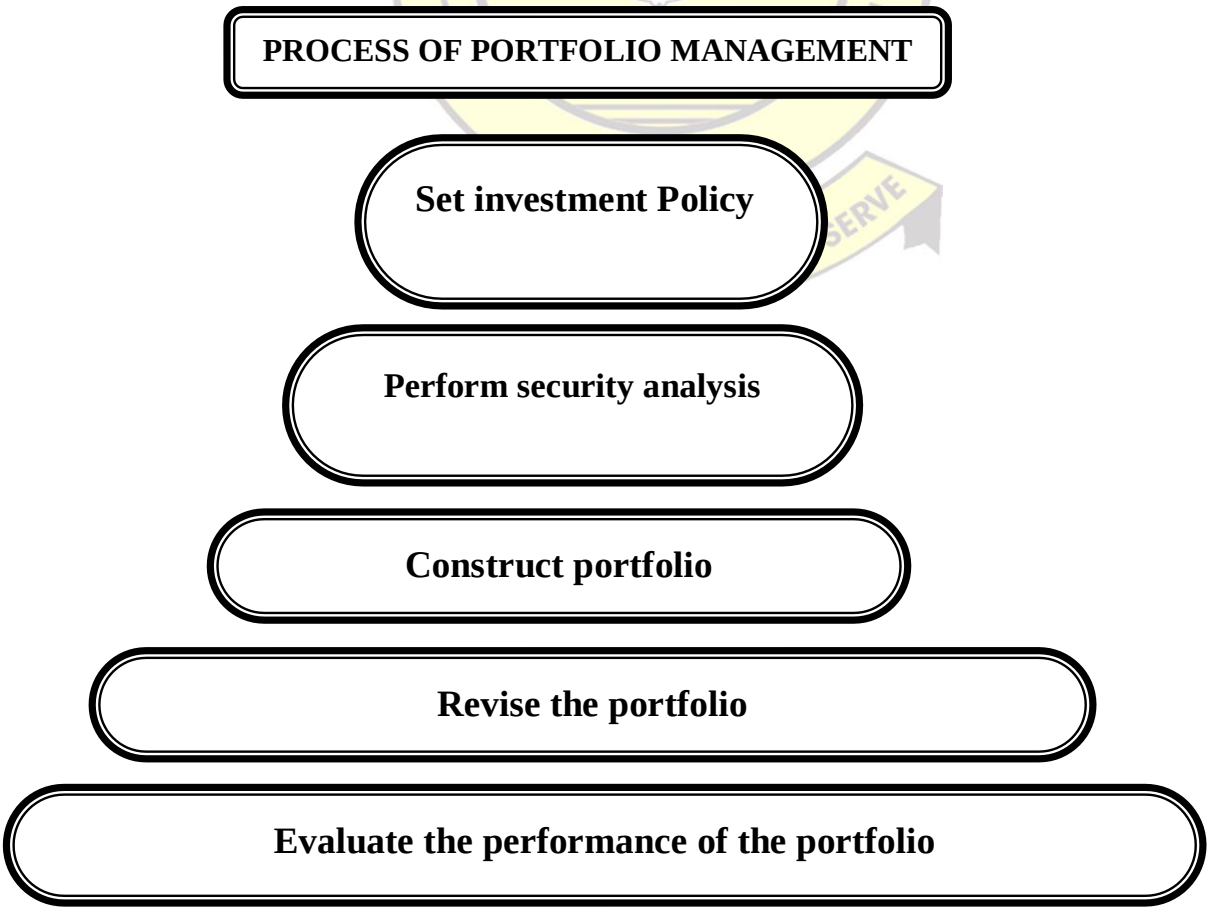
UNIT-5

PORTFOLIO MANAGEMENT

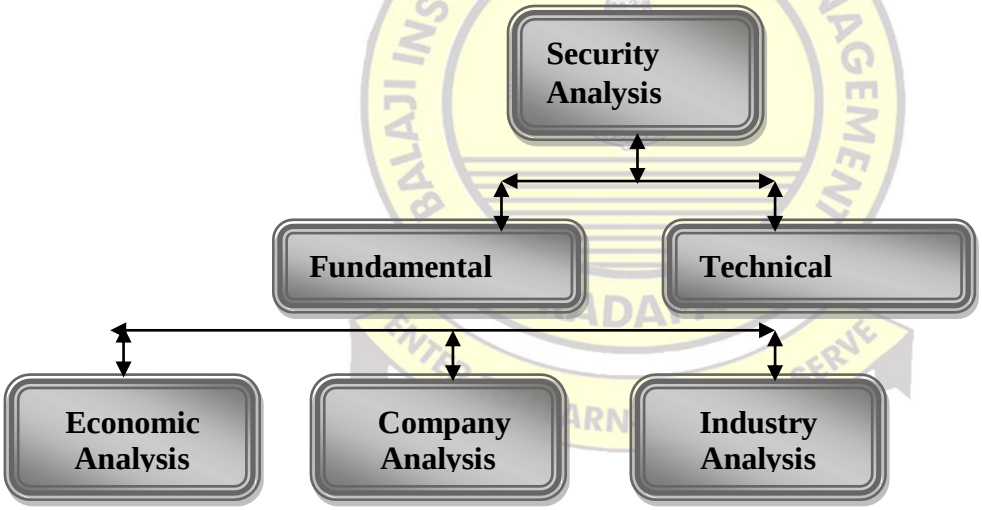
5. PORTFOLIO MANAGEMENT

Definition: Portfolio Management implies tactfully managing an investment portfolio, by selecting the best investment mix in the right proportion and continuously shifting them in the portfolio, to increase the return on investment and maximize the wealth of the investor. Here, portfolio refers to a range of financial products, i.e. stocks, bonds, mutual funds.

5.1. PROCESS OF PORTFOLIO MANAGEMENT:-Investment process describes how an investor should go about making decisions with regard to what marketable securities to investment in, how extensive the investments should be made. A five step procedure for making these decisions forms the basis of the investment process:



1. **Set investment policy:** It is a combination of investor's philosophy and planning. It expresses the investor's attitudes toward important of investment management issues. A comprehensive investment policy should address the following issues.
    - MISSION STATEMENT
    - RISK TOLERANCE
    - INVESTMENT OBJECTIVES
    - POLICY ASSET MIX (allocation of finds to broad asset classes such as stocks and bonds.
    - ACTIVE MANAGEMENT
2. **Security Analysis:** It involves examining several individual securities (or group of securities) within the broad categories of financial assets. It helps for the selection of securities which are give fair returns in the current and future years.



3. **Portfolio construction:-**It involves identifying those specific assets in which to invest, as well as determining the portions of the investor's wealth to put into each one. Here the issues of selectivity, timing and diversification need to be addressed by the investor. There two approaches to construct portfolio of securities.
    - **Traditional Approach**
    - **Modern Approach** :Markowitz Risk-return optimization model
      :Sharp optimum portfolio model

4. **Portfolio Revision:-**It helps for liquidating the unattractive securities and acquiring the new stars from the market. It involves periodic repetition of the previous three steps of the investment policy by setting new investment policy, security analysis afresh, and reallocation of cash for the new portfolio.

- **Formula Plans** are to ease the problem of timing and minimize the emotions involved in investment.

1. To minimize loss but not to increase profits.
2. In formula plans the portfolio investment involve two types
   - ❖ Aggressive Portfolio
   - ❖ Conservative Portfolio
3. Formula plans classified into four types.
   - ❖ Constant Rupee Plan
   - ❖ Constant Ratio Plan
   - ❖ Variable Ratio Plan
   - ❖ Rupee Cost Averaging Plan

5. **Portfolio Performance Evaluation:-**It involves determining periodically how the portfolio performed, in terms returns earned and the risk experienced by the investor. For this the investor need to select appropriate benchmark.

The following techniques are used for measuring the performance of the portfolio.

- ❖ **Sharpe's Performance Measure**
- ❖ **Treynor's Performance Measure**
- ❖ **Jensen's Performance Measure**

5.1.1 SCOPE OF PORTFOLIO MANAGEMENT

1) Monitoring the performance of portfolio by incorporating the latest market conditions.
2) Identification of the investor's objective, constraints and preferences.
3) Making an evaluation of portfolio income (comparison with targets and achievement).

4) Making revision in the portfolio.
5) Implementation of the strategies in tune with investment objectives.

5.1.2 BENEFITS OF PORTFOLIO MANAGEMENT

1) Increased decision making transparency through a more consistent evaluation of all business units and options.
2) A consistent approach to risk measurement.
3) A systematic way of including different views of risk in decision making process.
4) A clear enhancement to the due diligence process.
5) Better understanding of value creation among new investment opportunities.
6) Consideration of the correlation and diversification effects of the organization's different businesses and investment options.
7) Guidance for strategic planning (e.g. identification of where the company needs to move to improve
8) its risk-return position).
9) Consideration of qualitative and non-financial implications. These benefits can easily be recognized across most organizations, regardless of size or industry.

5.2. MODERN PORTFOLIO (MPT)

MPT - Modern Portfolio Theory - represents the mathematical formulation of risk diversification in investing, that aims at selecting a group of investment assets which have collectively lower risk than any single asset on its own. This becomes possible, since various asset types frequently change in value in opposite directions. Actually investing, being a tradeoff between risk and return, presupposes that risky assets have the highest expected returns.

Thus, MPT shows how to choose a portfolio with the maximum possible expected return for the given amount of risk. It also describes how to choose a portfolio with the minimum

possible risk for the given expected return. Therefore, Modern Portfolio Theory is viewed as a form of diversification which explains the way of finding the best possible diversification strategy.

5.2.1 MODERN PORTFOLIO (MPT) ASSUMPTIONS

Modern Portfolio Theory relies on the following assumptions and fundamentals that are the key concepts upon which it has been constructed:

- For buying and selling securities there are no transaction costs. There is no spread between bidding and asking prices. No tax is paid, its only risk that plays a part in determining which securities an investor will buy.
- An investor has a chance to take any position of any size and in any security. The market liquidity is infinite and no one can move the market. So that nothing can stop the investor from taking positions of any size in any security.
- While making investment decisions the investor does not consider taxes and is indifferent towards receiving dividends or capital gains.
- Investors are generally rational and risk adverse. They are completely aware of all the risk contained in investment and actually take positions based on the risk determination demanding a higher return for accepting greater volatility.
- The risk-return relationships are viewed over the same time horizon. Both long term speculator and short term speculator share the same motivations, profit target and time horizon.
- Investors share identical views on risk measurement. All the investors are provided by information and their sale or purchase depends on an identical assessment of the investment and all have the same expectations from the investment. A seller will be motivated to make a sale only because another security has a level of volatility that corresponds to his desired return. A buyer will buy because this security has a level of risk that corresponds to the return he wants.
- Investors seek to control risk only by the diversification of their holdings.
- In the market all assets can be bought and sold including human capital.

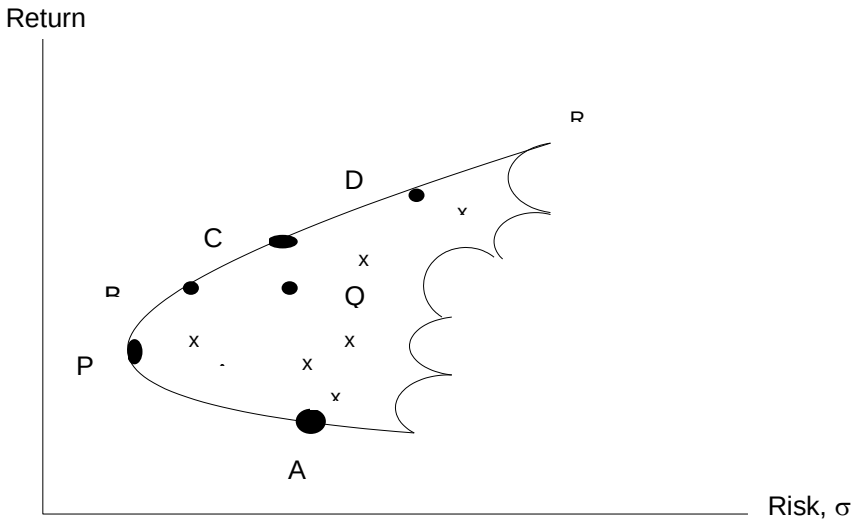
- Politics and investor psychology have no influence on market.
- The risk of portfolio depends directly on the instability of returns from the given portfolio.
- An investor gives preference to the increase of utilization.
- An investor either maximizes his return for the minimum risk or maximizes his portfolio return for a given level of risk.
- Analysis is based on a single period model of investment.

5.2.2 Choosing the Best Portfolio

Two essential decisions are necessary to be made to choose the best portfolio from a number of possible portfolios, each with its risk and return opportunities:

1. Determine a set of efficient portfolios.
2. Select the best portfolio out of the efficient set.

Being an important achievement in the financial sphere, the theory has found ground in other fields as well. In 1970s, it was widely applied in the area of regional sciences to derive the relationship between variability and economic growth. Similarly it has been used in the field of social psychology to form the self-concept. Currently, it is used by experts to model project portfolios of both financial and non-financial instruments.

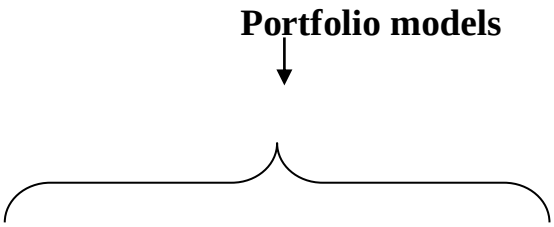


A risk – averse investor will prefer a portfolio with the highest expected return per a given level of risk (or) prefer a portfolio with the lowest level of risk for a given level of expected returns. This is referred as "the principle of dominance."

The portfolios which are located on the efficient frontier considered as efficient portfolios which gives highest expected rate of return at a given level of risk (or) at a low level of risk gives high expected returns. The portfolios which are not located on efficient frontier considered as inefficient portfolios.

From the above chart portfolio **Q** has same return as portfolio B but it has higher risk. Similarly, portfolio C has higher return than portfolio Q with same amount of risk. Q is an inefficient portfolio. Portfolio B and C are efficient portfolios. Portfolio B has low risk and low return, while portfolio C has high risk and high return. B dominates C. The choice portfolio will depend on the investor's risk – preference.

5.3 PORTFOLIO MODELS



Markowitz model **Sharpe single index model**

THE HARRY MARKOWITZ MODEL

Markowitz Portfolio Theory (MPT), a hypothesis put forth by Harry Markowitz in his paper "Portfolio Selection," (published in 1952 by the Journal of Finance) is an investment theory based on the idea that risk-averse investors can construct portfolios to optimize or maximize expected return based on a given level of market risk, emphasizing that risk is an inherent part of higher reward. It is one of the most important and influential economic theories dealing with finance and investment.

Harry Markowitz model (HM model), also known as Mean-Variance Model because it is based on the expected returns (mean) and the standard deviation (variance) of different portfolios, helps to make the most efficient selection by analyzing various portfolios of the given assets. It shows investors how to reduce their risk in case they have chosen assets not “moving” together.

Assumptions of Markowitz Model

Markowitz Theory is based on several assumptions regarding investor behavior:

1) Investors consider each investment alternative as being represented by a probability distribution of expected returns over some holding period.
2) Investors maximize one period expected utility and possess utility curve, which demonstrates diminishing marginal utility of wealth.
3) Individuals estimate risk on the basis of the variability of expected returns.
4) Investors' base decisions solely on expected return and variance (or standard deviation) or returns only.
5) For a given risk level, investors prefer high returns to lower returns. Similarly, for a given level of expected return, investor prefer less risk to more risk.

Under these assumptions, a single asset or portfolio of assets is considered to be "**efficient**" if no other asset or portfolio of assets offers higher expected return with the same (or lower) risk or lower risk with the same (or higher) expected return.

Opportunity Set/Feasible Set of Portfolios

With a limited number of securities an investor can create a very large number of portfolios by combining these securities in different proportions. These constitute the portfolio opportunity set in which the investor can possibly invest. This is also known as **Feasible Set of Portfolios**. Each portfolio in the opportunity set is characterized by an expected return and a measure of risk, i.e. variance or standard deviation of returns. Not every portfolio in the portfolio opportunity set is of interest to an investor. In the opportunity set, some portfolios will obviously be dominated by others. A portfolio will dominate another if it has either a lower standard deviation and the same expected return as the other, or a higher expected return and the same standard deviation as the other. Portfolios that are dominated by other portfolios are known as inefficient portfolios. An investor would not be interested in all the portfolios in the opportunity set. He would be interested only in the efficient portfolios.

Efficient Set of Portfolio

Harry Markowitz first described the goal of portfolio theory as the process of identifying an efficient set of portfolios. An efficient portfolio is a portfolio for which no greater expected return can be found

without a corresponding increase in risk. Alternatively, efficient portfolios are those for which no greater certainty of returns can be achieved without a decrease in expected return. Once this efficient set of portfolios is identified at the asset class level, the investment manager chooses an actual allocation on that frontier that best conforms to the desired risk/return targets of the investors in the fund.

The **set of efficient portfolios is commonly called the efficient frontier**. A typical set of such efficient portfolios is depicted in **figure 6.1.** This plot associates the expected return on a portfolio with a given level of risk or, conversely, the risk of a portfolio with a given expected portfolio return.

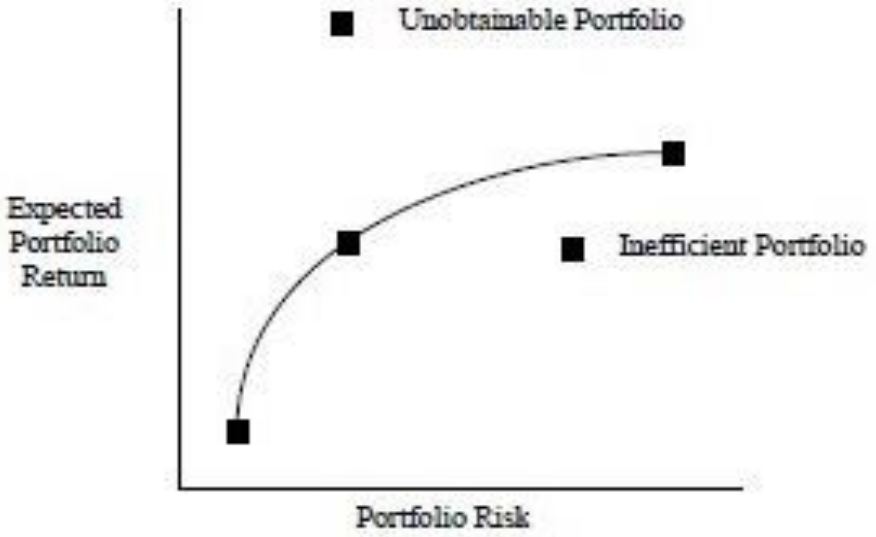


Figure 6.1: Efficient Frontier

The concave line depicted in the **figure 6.1** is the efficient frontier formed by tracing the boundary of all portfolios that are combinations of selected asset classes. Points inside the frontier are inefficient because less return for the risk is achieved. Points outside the line, by contrast, are more desirable, but are not obtainable (i.e., infeasible). Portfolio 1 is the minimum risk portfolio and offers the least risk of any combination of asset classes, whereas Portfolio 3 is the maximum return/maximum risk portfolio. Although Portfolio 3 corresponds to 100 per cent investment in the asset class with the greatest return, Portfolio 1, by contrast, usually will not be composed only of the least risky asset class owing to the risk-reducing effects of diversification across asset classes with different risks. For moderate return and risk, portfolios away from the endpoints, such as Portfolio 2, typically are chosen. Such portfolios

Suppose, an investor is evaluating two securities, A and B.

	Security A		Security B
Expected return	12%		20%
Standard deviation of return	20%		40%
Coefficient of correlation		–0.20	

The investor can combine securities A and B in a portfolio in a number of ways by simply changing the proportions of funds allocated to them. Some of the options available to him are shown below:

Portfolio	Proportion of A w_A	Proportion of B w_B	Expected Return E(Rp)	Standard Deviation σ_p
1 (A)	1.00	0.00	12.00%	20.00%
2	0.90	0.10	12.80%	17.64%
3	0.759	0.241	13.93%	16.27%
4	0.50	0.50	16.00%	20.49%
5	0.25	0.75	18.00%	29.41%
6 (B)	0.00	1.00	20.00%	40.00%

The six options described above are plotted graphically in **figure 6.2**. Few important points about this graph may be noted:

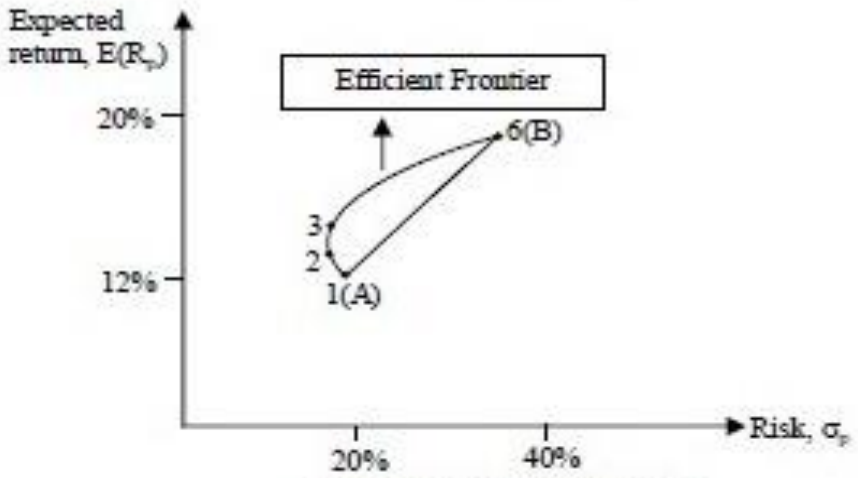


Figure 6.2: Portfolio Options

1) The benefit of diversification arises when the correlation between the two securities is less than 1. Because the correlation between securities A and B is – 0.20 (which is less than 1), the effect of diversification can be seen by comparing the curved line between points A and B with the straight line between A and B. The straight line represents the risk-return possibilities by combining A and B if

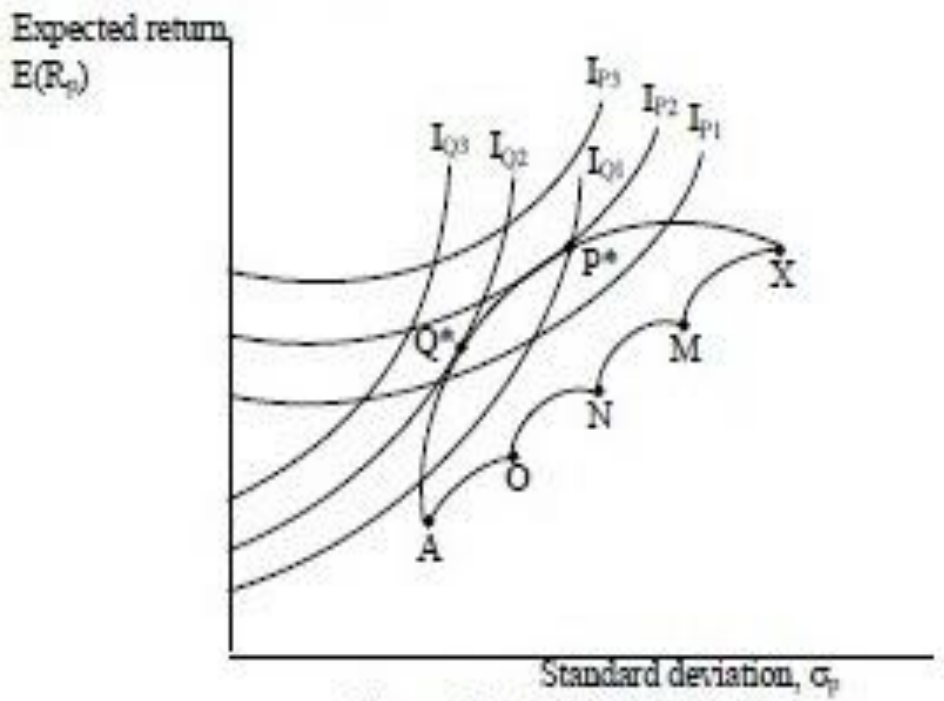


Figure 6.7: Optimal Portfolio

5.4.5. Sharpe Single Index Model

The Markowitz model is an elegant formulation of the portfolio problem that forms the basis of the Capital Asset Pricing Model (CAPM). From a practical point of view, however, it **has two shortcomings.**

1) The first is the problem of **computational complexity**. To see this, consider that over 2000 stocks are traded on the NSE alone. The covariance matrix of returns is a 2000x2000 matrix, which contains 4 million numbers (though about half of these are the same). Imagine first estimating all the parameters in this matrix, and then using the matrix to calculate the efficient frontier. Now, add the thousands of other securities that are traded, and you get an idea of the practical difficulties of applying the model.
2) The second problem is that the model assumes that all the risk and return characteristics can be explained by the covariance of the return with that of other securities. Thus, changes in non-financial factors, such as the growth rate of the economy or the inflation rate, are not accounted for directly.

Calculation of Return under Single Index Model

Following formula is used to calculate the return under single index model.

$$R_i = \alpha_i + \beta_i R_m + e_i$$

where,

R_i = return on i^{th} security
R_m = return on a market index
α = constant term
β = market beta or market sensitivity of a given stock
e_i = unsystematic risk

The variance of security's return $\sigma^2 = \beta_i \sigma_m^2 + \sigma_{ei}^2$

The covariance of returns between securities i and j is,

$$\sigma_{ij} = \beta_i \beta_j \sigma_m^2$$

The variance of the security has two components namely, systematic risk or market risk and unsystematic risk or unique risk. The variance explained by the index is referred to systematic risk. The unexplained variance is called residual variance or unsystematic risk.

$$\text{Systematic risk} = \beta_i^2 \times \text{variance of market index}$$
$$= \beta_i^2 \sigma_m^2$$

Unsystematic risk = Total variance – Systematic risk.

$$e_i^2 = \sigma_i^2 - \text{systematic risk}$$

Thus, the total risk = Systematic risk + Unsystematic risk.

$$= \beta_i^2 \sigma_m^2 + e_i^2$$

From this, the portfolio variance can be derived,

$$\sigma_p^2 = \left[\left(\sum_{i=1}^{N} x_i \beta_i\right)^2 \sigma_m^2\right] + \left[\sum_{i=1}^{N} x_i^2 e_i^2\right]$$

σ^2 = variance of portfolio

σ^{2^p} = expected variance of index

$e_i^{2^m}$ = variation in security's return not related to the market index

x_i = the portion of stock i in the portfolio

Likewise, expected return on the portfolio also can be estimated. For each security α_i and β_i should be estimated.

$$R_P = \sum_{i=1}^{N} x_i (\alpha_i + \beta_i R_m)$$

Portfolio return is the weighted average of the estimated return for each security in the portfolio. The weights are the respective stocks proportions in the portfolio.

A portfolio's alpha value is a weighted average of the alpha values for its component securities using the proportion of the investment in a security as weight.

$$\sigma_P = \sum_{i=1}^{N} x_i \alpha_i$$

where,

α_P = value of the alpha for the portfolio
x_i = proportion of the investment on security i
α_i = value of alpha for security i
N = number of securities in the portfolio.

Similarly, a portfolio's beta value is the weighted average of the beta values of its component stocks using relative share of them in the portfolio as weights.

$$\beta_P = \sum_{i=1}^{N} x_i \beta_i$$

β_P is the portfolio beta.

Example 1: The following details are given for X and Y companies stocks and the Bombay Sensex for a period of one year. Calculate the systematic and unsystematic risk for the companies' stocks. If equal amount of money is allocated for the stocks what would be the portfolio risk?

	X Stock	Y Stock	Sensex
Average return	0.15	0.25	0.06
Variance of return	6.30	5.86	2.25
β	0.71	0.27	
Correlation coefficient	0.424		
Coefficient of determination (r^2)	0.18		

Solution: The coefficient of determination (r^2) gives the percentage of the variation in the security's return that is explained by the variation of the market index return. In the X company stock return, 18 per cent of

variation is explained by the variation of the index and 82 per cent is not explained by the index.

Explained by the index
= variance of security return × coefficient of determination
= 6.3 × 0.18 = 1.134

Not explained by the index = variance of security return × $(1 - r^2)$
= 6.3 × (1 – 0.18)
= 6.3 × 0.82 = 5.166

According to Sharpe, the variance explained by the index is the systematic risk. The unexplained variance or the residual variance is the unsystematic risk.

Company X

Systematic risk = β^2 × Variance of market index
= $(0.71)^2 \times 2.25 = 1.134$

Unsystematic risk = Total variance of security return – systematic risk
= e_i^2
= 6.3 – 1.134 = 5.166

Total risk = $\beta_i^2 \times \sigma_m^2 + e_i^2$
= 1.134 + 5.166 = 6.3

Company Y

Systematic risk = $\beta_i^2 \times \sigma_m^2$
= $(0.27)^2 \times 2.25 = 0.1640$

Unsystematic risk = Total variance of the security return – systematic risk
= 5.86 – 0.1640 = 5.696

$$\sigma_p^2 = \left[\left(\sum_{i=1}^{N} x_i \beta_i\right)^2\right] + \left[\sum_{i=1}^{N} x_i^2 e_i^2\right]$$

= $[(0.5 \times 0.71 + 0.5 \times 0.27)^2\ 2.25] + [(0.5)^2\ (5.166) + (0.5)^2\ (5.696)]$
= $[(0.355 + 0.135)^2\ 2.25] + [(1.292 + 1.424)]$
= 0.540 + 2.716 = 3.256

Example 2: Consider a portfolio of four securities with the following characteristics:

Security	Weighting	α_i	β_i	Residual Variance (σ_{ei}^2)
1	0.2	2.0	1.2	320
2	0.3	1.7	0.8	450

3	0.1	–0.8	1.6	270
4	0.4	1.2	1.3	180

Calculate the return and risk of the portfolio under single index model, if the return on market index is 16.4 per cent and the standard deviation of return on market index is 14 per cent.

Solution:

1) Portfolio return under single index model is calculated using the formula:

$R_p = \alpha_p + \beta_p R_m$

For applying this formula, α_p and β_p have to be calculated as:

$$\alpha_p = \sum_{i=1}^{n} w_i \alpha_i$$
$$= (0.2)(2.0) + (0.3)(1.7) + (0.1)(-0.8) + (0.4)(1.2)$$
$$= 1.31$$

$$\beta_p = \sum_{i=1}^{n} w_i \beta_i$$
$$= (0.2)(1.2) + (0.3)(0.8) + (0.1)(1.6) + (0.4)(1.3)$$
$$= 1.16$$

$$R_p = \alpha_p + \beta_p R_m$$
$$= 1.31 + (1.16)(16.4)$$
$$= 1.31 + 19.024$$
$$= 20.334$$

2) Portfolio risk under single index model is calculated as:

$$\sigma_p^2 = \beta_p^2 \sigma_m^2 + \sum_{i=1}^{2} w_i^2 \sigma_{ei}^2$$

For applying this, portfolio residual variance needs to be calculated as:

$$\sum_{i=1}^{n} w_i^2 \sigma_{ei}^2$$

Thus,

$= (0.2)^2(320) + (0.3)^2(450) + (0.1)^2(270) + (0.4)^2(180)$
$= 12.8 + 40.5 + 2.7 + 28.8 = 84.8$

Now,

$$\sigma_p^2 = \beta_p^2 \sigma_m^2 + \sum_{i=1}^{n} w_i^2 \sigma_{ei}^2$$
$$= (1.16)^2(14)^2 + 84.8$$
$$= 263.74 + 84.8 = 348.54$$

Hence, $\sigma_p = \sqrt{348.54} = 18.67$

5.4. CAPITAL ASSET PRICING MODEL

Capital Asset Pricing Model also abbreviated as CAPM was proposed by Jack Treynor, William Sharpe, John Lintner and Jan Mossin.

When an asset needs to be added to an already well diversified portfolio, Capital Asset Pricing Model is used to calculate the asset's rate of profit or rate of return (ROI).In Capital Asset Pricing Model, the asset responds only to:

- Market risks or non diversifiable risks often represented by beta
- Expected return of the market
- Expected rate of return of an asset with no risks involved

The asset return depends on the amount paid for the asset today. The price paid must ensure that the market portfolio's risk / return characteristics improve when the asset is added to it. The CAPM is a model that derives the theoretical required expected return (i.e., discount rate) for an asset in a market, given the risk-free rate available to investors and the risk of the market as a whole.

Capital Asset Pricing Model is used to determine the price of an individual security through security market line (SML) and how it is related to systematic risks.

What is Security Market Line ?

Security Market Line is nothing but the graphical representation of capital asset pricing model to determine the rate of return of an asset sensitive to non diversifiable risk (Beta).

$$SML: E(R_i) = R_f + \beta_i[E(R_M) - R_f]$$

The CAPM is usually expressed:

E (Ri)= Rf+ βi (E (Rm)-Rf)

β, Beta, is the measure of asset sensitivity to a movement in the overall market; Beta is usually found via regression on historical data. Betas exceeding one signify more than average "riskiness" in the sense of the asset's contribution to overall portfolio risk; betas below one indicate a lower than average risk contribution.

$(E (R_m) - R_f)$ is the market premium, the expected excess return of the market portfolio's expected return over the risk-free rate.

BALAJI INSTITUTE OF I.T.& MANAGEMENT
KADAPA
ENTER TO LEARN-LEAVE TO SERVE

- Expected return:

$$\mathrm{E}(R_p) = \sum_i w_i \, \mathrm{E}(R_i)$$

where R_p is the return on the portfolio, R_i is the return on asset *i* and w_i is the weighting of component asset i (that is, the proportion of asset "i" in the portfolio).

- Portfolio return variance:

$$\sigma_p^2 = \sum_i w_i^2 \sigma_i^2 + \sum_i \sum_{j \neq i} w_i w_j \sigma_i \sigma_j \rho_{ij},$$

where σ is the (sample) standard deviation of the periodic returns on an asset, and ρ_{ij} is the correlation coefficient between the returns on assets *i* and *j*. Alternatively the expression can be written as:

$$\sigma_p^2 = \sum_i \sum_j w_i w_j \sigma_i \sigma_j \rho_{ij},$$

where $\rho_{ij} = 1$ for $i = j$, or

$$\sigma_p^2 = \sum_i \sum_j w_i w_j \sigma_{ij},$$

where $\sigma_{ij} = \sigma_i \sigma_j \rho_{ij}$ is the (sample) covariance of the periodic returns on the two assets, or alternatively denoted as $\sigma(i,j)$, cov_{ij} or $cov(i,j)$.

- Portfolio return volatility (standard deviation):

$$\sigma_p = \sqrt{\sigma_p^2}$$

For a **two asset** portfolio:

- Portfolio return: $\mathrm{E}(R_p) = w_A\,\mathrm{E}(R_A) + w_B\,\mathrm{E}(R_B) = w_A\,\mathrm{E}(R_A) + (1 - w_A)\,\mathrm{E}(R_B).$
- Portfolio variance: $\sigma_p^2 = w_A^2\sigma_A^2 + w_B^2\sigma_B^2 + 2w_A w_B \sigma_A \sigma_B \rho_{AB}$

For a **three asset** portfolio:

- Portfolio return: $\mathrm{E}(R_p) = w_A\,\mathrm{E}(R_A) + w_B\,\mathrm{E}(R_B) + w_C\,\mathrm{E}(R_C)$
- Portfolio variance:

$$\sigma_p^2 = w_A^2\sigma_A^2 + w_B^2\sigma_B^2 + w_C^2\sigma_C^2 + 2w_A w_B \sigma_A \sigma_B \rho_{AB} + 2w_A w_C \sigma_A \sigma_C \rho_{AC} + 2w_B w_C \sigma_B \sigma$$

UNIT-5-IMPORTANT QUESTIONS

1) Explain the Process of Portfolio Management,
2) Briefly write about Modern Portfolio (Markowitz model & Sharpe single index model)
3) What is CAPM? Detail note on Capital Asset Pricing Models

Problems: Sharpe single index model.

Code: 17E00312

MBA III Semester Supplementary Examinations October 2020

INVESTMENT & PORTFOLIO MANAGEMENT

(For students admitted in 2017 & 2018 only)

Time: 3 hours Max. Marks: 60

All questions carry equal marks

*****

SECTION – A

(Answer the following: 05 X 10 = 50 Marks)

1 (a) Elucidate the process of investment undertaken by the investor.

(b) Explain the various functions of capital market.

OR

2 Explain the economic and financial meaning of investment and differentiate investor from speculator.

3 Describe the various characteristics of an industry that an analyst must consider while doing industry analysis.

OR

4 Explain how technical analysis can be used in deciding the timing for buying and selling of securities.

5 (a) If the expected returns of two stocks are same but the standard deviation of the returns differ, which security is to be preferred.

(b) If an investor desires diversification, should he/she seek investments that have a high positive correlation?

OR

6 What is simple diversification? Can it reduce total risk? Can it reduce unsystematic risk?

7 The market price of a bond with maturity of five years is Rs.1100/- its par value is Rs.1000/- and coupon rate is 15%. What is the yield to maturity of this bond?

OR

8 What are the basic valuation models of bonds? How do you calculate yield on bonds?

9 What is portfolio management? Explain the models of portfolio management.

OR

10 "Modern Portfolio theory helps in the optimal allocation of global resources "Comment.

SECTION – B

(Compulsory question, 01 X 10 = 10 Marks)

11 **Case Study:**

Mr.RKV invested in equity shares of Wipro Limited, it's anticipated returns and associated probabilities are given below:

Return %	Probability
-15	0.05
-10	0.10
5	0.15
10	0.25
15	0.10
20	0.10
30	0.05

You are required to calculate: (i) The expected rate of return. (ii) Risk in terms of SD.

*****

Code: 17E00312

MBA III Semester Regular & Supplementary Examinations November/December 2019

INVESTMENT & PORTFOLIO MANAGEMENT

(For students admitted in 2017 & 2018 only)

Time: 3 hours Max. Marks: 60

All questions carry equal marks

*****

SECTION – A

(Answer the following: 05 X 10 = 50 Marks)

1 Discuss about different types of investments.

OR

2 Describe various steps in the process of investment.

3 Describe various tools for company analysis.

OR

4 Write briefly about the following:

(a) Dow theory.

(b) Industry life cycle.

5 Distinguish between asset beta and levered beta.

OR

6 Define return. Differentiate between revue return and capital appreciation.

7 Describe the quantitative models of preference share valuation.

OR

8 Illustrate various techniques used for common stock valuation.

9 Explain Markowitz's portfolio theory and state its assumptions and limitations.

OR

10 Elaborate the features of Sharpe single index model of portfolio construction.

SECTION – B

(Compulsory question, 01 X 10 = 10 Marks)

11 **Case Study:**

The tangential portfolio of an investor yields an expected return of 20 percent and a standard deviation of 12 percent. The risk-free rate is 6 percent. The value of risk aversion by the investor is 5 (slope of the utility line). Determine the optimum portfolio weight of the investor.

*****

Code: 17E00312

MBA III Semester Supplementary Examinations May 2019

INVESTMENT & PORTFOLIO MANAGEMENT

(For students admitted in 2017 only)

Time: 3 hours Max. Marks: 60

All questions carry equal marks

*****

SECTION – A

(Answer the following: 05 X 10 = 50 Marks)

1 (a) Explain the economic and financial meaning of investment and differentiates investor from speculator.

(b) What are financial markets and instruments? How do they support investors and stock markets?

OR

2 What do you understand by stock markets? Write the role of BSE and NSE in price discovery.

3 Discuss and compare the main features of fundamental and technical analysis.

OR

4 Explain the nature and methodology of technical analysis. What are the differences between "Bar charting" and "Candle stick charting"?

5 What is return? Explain different methods of calculating return.

OR

6 Explain in detail about the systematic risk with examples.

7 What are the basic valuation models of bonds? How do you calculate yield on bonds?

OR

8 Aswini Ltd has a 14% bond with a face value of Rs.100 that matures at par in 15 years. The bond is callable in five years at Rs.114. It currently sells for Rs.105. Calculate: (i) Current yield. (ii) Yield to maturity. (iii) Yield to call.

9 Modern portfolio theory helps in the optimal allocation of global resources. Comment.

OR

10 Explain Sharpe's single index model in detail.

SECTION – B

(Compulsory question, 01 X 10 = 10 Marks)

11 **Case Study:**

Determine portfolio risk if $W_a = 30$, $W_b = 70$, $SD_a = 25$, $SD_b = 30$, if R_{ab} is +0.80. Also determine total return of A & B if return on security A is 28% and B is 32%.

*****

Code: 17E00312

MBA III Semester Regular Examinations November/December 2018

INVESTMENT & PORTFOLIO MANAGEMENT

(For students admitted in 2017 only)

Time: 3 hours Max. Marks: 60

All questions carry equal marks

*****

SECTION – A

(Answer the following: (05 X 10 = 50 Marks)

1 Define investment. Describe various modes of investments.

OR

2 (a) State the objectives of investment.
(b) Distinguish between investment and speculation.

3 State the purpose of economic analysis and list the sources of information for economic analysis.

OR

4 What is technical analysis? Explain how technical analysis is useful to investors.

5 Exemplify the differences between systematic and unsystematic risk.

OR

6 Illustrate the methods of calculating expected return.

7 What are securities? Describe different types of securities.

OR

8 Illustrate any two techniques of bond valuation.

9 What is Capital Asset Pricing Method (CAPM)? Explain the rationale and assumptions of CAPM.

OR

10 Explain how portfolios can be developed for individual investors according to their risk preferences.

PART – B

(Compulsory question, 01 X 10 = 10 Marks)

11 **Case study:**

An investment company manages an equity fund consisting of five stocks, with the following market values and betas.

Stock	Market value	Betas
A	₹ 1,00,000	1.10
B	₹ 25,000	1.20
C	₹ 50,000	0.75
D	₹ 1,25,000	0.60
E	₹ 1,65,000	1.30
Total =	4,65,000	

If RF = 7%, E(Rm) = 14%, compute the portfolio's expected return.

*****