Variance is another method to measure total risk. It is the square of the standard deviation and reflects the dispersion of returns from the mean. Higher variance indicates higher risk.

Formula:
Variance = $\Sigma (Ri - \bar{R})^2 / N$

3. Range of Returns

Range is a simple method to measure risk by calculating the difference between the highest and lowest returns over a period. It gives a basic idea of return variability but is less precise than standard deviation or variance.

4. Coefficient of Variation (CV)

CV is used to compare risk across different investments. It shows the risk per unit of return. A lower CV indicates better risk-adjusted returns.

Formula:
CV = Standard Deviation ÷ Average Return

5. Beta (for Systematic Risk)

While Beta measures only market-related risk, it helps assess how much an investment's returns move relative to the market. Though it does not measure total risk, it complements other methods by isolating systematic risk.

3.1 Economy Analysis

Meaning of Economy Analysis

Economy analysis is the process of studying the overall economic environment to understand its impact on businesses, industries, and investment decisions. It helps investors and companies assess how economic factors influence market performance and profitability.

Purpose of Economy Analysis

The main purpose of economy analysis is to evaluate whether the present economic conditions are favourable for investments, business expansion, and market growth. A strong economy boosts business activity, while a weak economy can lead to poor market performance.

Key Factors Considered in Economy Analysis

1. Gross Domestic Product (GDP)

GDP measures the total value of goods and services produced in a country. High GDP growth indicates a healthy economy with rising incomes and business opportunities, while low GDP growth signals slowdown or recession.

2. Inflation Rate

Inflation refers to the rise in prices of goods and services over time. Moderate inflation is acceptable, but high inflation reduces purchasing power and increases costs for businesses, affecting profitability.

3. Interest Rates

Interest rates set by central banks influence borrowing costs for businesses and consumers. High-interest rates reduce spending and investments, while low rates encourage borrowing and economic growth.

4. Employment Levels

Employment levels indicate the economic well-being of the population. Higher employment means better income and spending, supporting business growth. Rising unemployment indicates economic weakness.

5. Exchange Rates

Exchange rates affect the value of a country's currency in global markets. A strong currency benefits importers, while a weak currency supports exports but may increase inflation.

6. Government Policies

Government policies such as taxation, subsidies, investment incentives, and infrastructure development directly impact business activities and market conditions.

7. Global Economic Conditions

In an interconnected world, global factors like oil prices, international trade, and geopolitical events influence the domestic economy and investment environment.

3.2 Industry Analysis

Meaning of Industry Analysis

Industry analysis is the process of evaluating a specific sector or group of companies that produce similar goods or services. It helps investors, businesses, and analysts understand the competitive landscape, growth potential, and risks within an industry.

Purpose of Industry Analysis

The main objective of industry analysis is to assess whether a particular industry is attractive for investment or business operations. It helps in identifying industries that are growing, stable, or declining, aiding in better decision-making.

Key Factors Considered in Industry Analysis

1. Industry Life Cycle

Industries go through different stages: introduction, growth, maturity, and decline. Growing industries offer higher investment potential, while mature or declining industries may have limited opportunities.

2. Market Size and Growth Rate

The overall size of the industry and its growth rate indicate demand trends. Expanding industries with increasing market size are favourable for businesses and investors.

3. Competition Level

High competition can reduce profit margins, while industries with fewer players often enjoy higher profitability. Industry analysis examines the intensity of competition and market share distribution.

4. Regulatory Environment

Industries are often affected by government rules, licenses, and regulations. Favourable policies support growth, whereas strict regulations can increase operational costs or limit expansion.

5. Technological Factors

Technological advancements can change the structure of an industry. Industries that adopt new technology efficiently stay competitive, while others may face obsolescence.

6. Entry and Exit Barriers

Industries with high entry barriers, such as large capital requirements or licenses, face less competition. Low exit barriers allow companies to leave unprofitable markets easily.

7. Profitability and Margins

Industry analysis studies the average profit margins and return potential within the sector. High-margin industries attract more investors, while low-margin sectors are riskier.

8. Global Trends and Economic Impact

Global economic conditions, trade policies, and international demand can influence industry performance, especially for export-oriented sectors.

3.3 Company Analysis

Meaning of Company Analysis

Company analysis is the process of evaluating a company's financial health, operational efficiency, growth potential, and competitive position to assess its suitability for investment. It helps investors understand whether a company is fundamentally strong and worth investing in.

Purpose of Company Analysis

The main purpose of company analysis is to determine the true worth of a company, identify growth opportunities, assess risks, and predict future performance. It assists investors, creditors, and other stakeholders in making informed decisions.

Key Aspects of Company Analysis

1. Financial Statement Analysis

The financial statements of a company—Balance Sheet, Profit & Loss Account, and Cash Flow Statement—provide vital information about the company's assets, liabilities, income, expenses, and cash movements. They form the base of company analysis.

2. Profitability Analysis

Investors examine profitability through ratios such as:

- **Earnings Per Share (EPS) –** Profit available to each shareholder.
- **Net Profit Margin –** The percentage of revenue that becomes profit.
- **Return on Equity (ROE) –** Measures the return generated on shareholder funds.

3. Liquidity and Solvency

Liquidity analysis assesses a company's ability to meet short-term obligations, using ratios like the Current Ratio and Quick Ratio. Solvency analysis looks at long-term stability through Debt-to-Equity Ratio, indicating the company's financial risk.

4. Growth Potential

Company analysis evaluates sales growth, market expansion, product development, and innovation capacity. A company with consistent growth is seen as attractive for long-term investments.

5. Competitive Position

Understanding the company's market share, brand strength, product quality, and customer loyalty helps assess its ability to compete effectively within the industry.

6. Management Efficiency

Strong, experienced, and ethical leadership contributes to business success. Analysis includes evaluating the management's track record, decision-making ability, and governance standards.

7. Dividend Policy

A company's dividend history and payout ratio reflect its profitability and financial stability. Regular dividends are attractive to income-focused investors.

8. Risk Factors

Company analysis identifies potential risks such as legal issues, operational challenges, dependence on specific markets, or regulatory concerns that could affect performance.

3.4 Intrinsic Value

Meaning of Intrinsic Value

Intrinsic value refers to the actual or true worth of a security, asset, or investment, based on its fundamental characteristics. It is calculated through financial analysis, considering factors like company earnings, growth potential, assets, and market conditions, rather than just market price.

Importance of Intrinsic Value

Intrinsic value helps investors determine whether a security is fairly priced, overvalued, or undervalued. It is a key tool for value investing, where investors seek to buy undervalued securities for long-term gains.

Factors Considered in Calculating Intrinsic Value

1. Earnings and Cash Flows

The company's earnings and future cash flow projections are major components in estimating intrinsic value. Stable and growing earnings increase intrinsic value.

2. Growth Potential

The expected future growth of sales, profits, and market share is factored into intrinsic value calculations. Companies with higher growth prospects usually have higher intrinsic values.

3. Assets and Liabilities

The company's asset base, including property, machinery, technology, and cash reserves, along with liabilities, influence the intrinsic value. A strong asset position enhances value.

4. Industry and Economic Conditions

Economic trends, industry performance, regulatory environment, and competitive dynamics also affect the intrinsic value of companies.

Methods of Calculating Intrinsic Value

1. Discounted Cash Flow (DCF) Method

DCF involves estimating future cash flows from the business and discounting them to present value using an appropriate discount rate. It is widely used to find intrinsic value.

2. Dividend Discount Model (DDM)

For companies that pay regular dividends, the present value of expected future dividends is calculated to find the intrinsic value.

3. Asset-Based Valuation

This method adds the net value of company assets after deducting liabilities to determine intrinsic value, useful for asset-heavy businesses.

3.5 Valuation of Bonds

Meaning of Bond Valuation

Bond valuation is the process of determining the fair or intrinsic value of a bond based on its expected future cash flows. Investors use bond valuation to decide whether the market price of a bond is justified compared to its true worth.

Purpose of Bond Valuation

The main purpose of bond valuation is to calculate the present value of the bond's future payments, including periodic interest (coupon payments) and the principal repayment at maturity. This helps investors assess if a bond is worth investing in.

Key Components in Bond Valuation

1. Face Value (Par Value)

The face value is the amount the bondholder will receive from the issuer at maturity. It is usually ₹100 or ₹1,000 per bond but can vary.

2. Coupon Rate

The coupon rate is the fixed annual interest rate paid on the bond, expressed as a percentage of face value. It determines the periodic income an investor earns from the bond.

3. Time to Maturity

This refers to the remaining time until the bond matures and the face value is repaid. Bonds can be short-term, medium-term, or long-term based on maturity period.

4. Required Rate of Return (Discount Rate)

The required rate of return is the minimum return an investor expects from the bond. It is based on current market interest rates and the bond's risk level.

Bond Valuation Formula

The value of a bond is calculated using the formula:

Bond Price = (C × [1 - (1 + r)^-n] ÷ r) + (F ÷ (1 + r)^n)

Where:

- C = Annual coupon payment
- r = Required rate of return
- n = Number of years to maturity
- F = Face value of the bond

Factors Affecting Bond Valuation

1. Interest Rate Movements
2. Credit Rating of Issuer
3. Time to Maturity

3.6 Valuation of Preference Shares

Meaning of Preference Shares

Preference shares are a type of hybrid security that offers fixed dividends to shareholders and have preferential rights over equity shares in terms of dividend payment and capital repayment during liquidation. However, preference shareholders usually do not have voting rights.

Need for Valuation of Preference Shares

Valuation of preference shares helps investors calculate their fair price based on expected dividends and repayment terms. This assists investors in deciding whether to buy, hold, or sell such securities by comparing market price with intrinsic value.

Types of Preference Shares

1. Perpetual (Irredeemable) Preference Shares

These preference shares do not have a maturity date and pay fixed dividends indefinitely. Valuation focuses on the present value of expected dividend income.

2. Redeemable Preference Shares

These preference shares have a fixed maturity period, after which the capital is repaid to shareholders. Valuation considers both periodic dividend income and the repayment amount at maturity.

Valuation of Perpetual Preference Shares

The formula for valuing perpetual preference shares is:

Value = D ÷ r

Where:

- D = Annual fixed dividend
- r = Required rate of return

This is similar to valuing a perpetuity where dividends are assumed to continue forever.

Valuation of Redeemable Preference Shares

The value of redeemable preference shares is calculated using:

Value = (D × [1 - (1 + r)^-n] ÷ r) + (F ÷ (1 + r)^n)

Where:

- D = Annual dividend
- r = Required rate of return
- n = Years to maturity
- F = Face value or redemption amount

Factors Affecting Valuation

1. Dividend Rate and Amount
2. Market Interest Rates
3. Creditworthiness of Issuer
4. Maturity Period for Redeemable Shares

3.7 Valuation of Equity Shares

Meaning of Equity Share Valuation

Equity share valuation is the process of estimating the true or intrinsic value of a company's shares based on its financial performance, growth prospects, and market conditions. It helps investors decide whether to buy, hold, or sell shares.

Need for Valuation of Equity Shares

Equity share prices fluctuate in the stock market due to demand, supply, and investor sentiment. Valuation helps investors determine if a share is overvalued, undervalued, or fairly priced, ensuring informed investment decisions.

Methods of Valuing Equity Shares

1. Dividend Discount Model (DDM)

This method values shares based on the present value of expected future dividends. It is suitable for companies that pay regular dividends.

Formula:
Value per Share = D ÷ r

Where:

- D = Expected annual dividend
- r = Required rate of return

For growing dividends, the formula is:
Value = D1 ÷ (r - g)

Where:

- D1 = Dividend expected next year
- r = Required rate of return
- g = Growth rate of dividends

2. Price-to-Earnings (P/E) Ratio Method

P/E ratio compares the market price of a share with the company's earnings per share (EPS).

Formula:
Value per Share = EPS × P/E Ratio

This method reflects investor expectations and market sentiment about the company's profitability.

3. Net Asset Value (NAV) Method

NAV is based on the company's total assets minus liabilities, divided by the number of shares.

Formula:
NAV per Share = (Total Assets - Total Liabilities) ÷ Number of Shares

This method is common for companies with significant tangible assets.

4. Earnings Capitalisation Method

This method values shares by capitalising the company's earnings at the required rate of return.

Formula:
Value per Share = EPS ÷ r

Where r is the investor's expected return.

Factors Affecting Equity Share Valuation

1. Company Performance
2. Industry and Market Trends
3. Dividend Policy
4. Economic Environment

4.1 Concept of Technical Analysis

Technical analysis is a method used to evaluate and forecast the price movements of securities by analysing historical market data, mainly price and volume. It is based on the belief that price reflects all available information and that price movements follow trends which can be identified through charts and technical indicators. Rather than focusing on company fundamentals like earnings or assets, technical analysis relies on patterns, trends, and statistical signals to make trading decisions.

Advantages of Technical Analysis

✔ **Quick Decision Making**
It allows traders to make fast buy or sell decisions based on real-time price charts without waiting for fundamental reports.

✔ **Focus on Timing**
Helps identify the right entry and exit points by observing price trends and momentum, improving the chances of profit.

✔ **Applicable Across Markets**
It can be used for analysing stocks, commodities, currencies, and indices across global markets.

✔ **Visual Simplicity**
Price charts present data in a simple visual format, making it easier to spot trends, patterns, and reversals.

✔ **Suitable for Short-Term Trading**
Especially useful for intraday and swing traders who rely on price movements rather than long-term fundamentals.

✔ **Market Sentiment Analysis**
Technical tools help gauge investor behaviour and market psychology, which often drive price fluctuations.

Limitations of Technical Analysis

✖ **Not Always Accurate**
Technical indicators and patterns are based on probabilities, not guarantees. Unexpected events can disrupt predictions.

✖ **Subjectivity in Interpretation**
Different traders may interpret the same chart pattern differently, leading to inconsistent conclusions.

✖ **Limited Use for Long-Term Investors**
It may not consider the broader financial health or long-term potential of a company, which is essential for value investors.

✖ **Dependence on Historical Data**
It assumes that past price behaviour repeats, which may not always hold true in dynamic or new market situations.

✖ **False Signals Possible**
In volatile or sideways markets, technical tools can generate misleading buy or sell signals, leading to potential losses.

4.2 Tools of Technical Analysis

Meaning of Technical Analysis Tools

Technical analysis tools are instruments, indicators, and charting techniques used to study historical price movements and trading volumes to forecast future price trends. These tools help traders and investors identify buy or sell signals and manage risks effectively.

Common Tools of Technical Analysis

1. Price Charts

Price charts visually represent the historical movement of securities. They are the most basic tool in technical analysis.

- **Line Charts:** Show the closing prices over time.
- **Bar Charts:** Show opening, high, low, and closing prices for each period.
- **Candlestick Charts:** Present price action in a visually easy-to-read format, highlighting bullish and bearish patterns.

2. Trendlines and Channels

Trendlines are straight lines drawn on price charts connecting highs or lows, indicating the direction of the market trend. Channels show price movement within parallel lines, helping identify breakout or breakdown zones.

3. Support and Resistance Levels

Support is the price level where demand is strong enough to prevent the price from falling further. Resistance is the price level where selling pressure prevents further price increases. These levels help in predicting price reversals or continuations.

4. Moving Averages

Moving averages smoothen price data to identify the underlying trend.

- **Simple Moving Average (SMA):** Average price over a period.
- **Exponential Moving Average (EMA):** Gives more weight to recent prices.

Crossovers of moving averages signal potential trend changes.

5. Momentum Indicators

These indicators measure the speed and strength of price movements.

- **Relative Strength Index (RSI):** Indicates overbought or oversold conditions.
- **Moving Average Convergence Divergence (MACD):** Detects changes in momentum and trend direction.

6. Volume Analysis

Volume reflects the number of shares or contracts traded. Increasing volume confirms price trends, while decreasing volume may indicate trend weakening.

7. Chart Patterns

Patterns like Head and Shoulders, Double Tops and Bottoms, Triangles, and Flags provide insights into potential trend reversals or continuations.

4.3 Technical Analysis Vs Fundamental Analysis

1. Meaning

- **Technical Analysis** focuses on studying historical price movements, trading volume, and chart patterns to predict future price behaviour. It assumes that all relevant information is already reflected in the price.
- **Fundamental Analysis** involves evaluating a company's financial statements, earnings, industry position, and economic factors to estimate its true intrinsic value.

2. Focus Area

- Technical analysis focuses only on market behaviour, price charts, and technical indicators.
- Fundamental analysis focuses on business performance, financial health, and growth prospects.

3. Time Horizon

- Technical analysis is generally used for short-term trading, intraday, or swing trades.
- Fundamental analysis is preferred for long-term investment decisions.

4. Tools Used

- Technical analysts use price charts, moving averages, RSI, MACD, and trendlines.
- Fundamental analysts use financial ratios, balance sheets, profit and loss accounts, and economic reports.

5. Approach to Valuation

- Technical analysis does not calculate intrinsic value; it relies on price patterns and market sentiment.
- Fundamental analysis aims to find the intrinsic value to determine if a stock is overvalued or undervalued.

6. Market Sentiment

- Technical analysis heavily considers market sentiment and investor psychology.
- Fundamental analysis focuses more on company-specific and economic fundamentals, with less emphasis on short-term sentiment.

7. Data Considered

- Technical analysis uses only price, volume, and market data.
- Fundamental analysis considers both quantitative data (financials) and qualitative data (management, industry conditions).

8. Advantages

- Technical analysis is useful for quick trading decisions and identifying short-term opportunities.
- Fundamental analysis provides a deeper understanding of the company and supports long-term wealth creation.

9. Limitations

- Technical analysis may provide false signals in volatile markets and ignores company fundamentals.
- Fundamental analysis may miss short-term price movements and requires more detailed research.

4.4 Efficient Market Hypothesis and Forms of Market Efficiency

Meaning of Efficient Market Hypothesis (EMH)

The Efficient Market Hypothesis (EMH) states that financial markets are efficient, meaning all available information is already reflected in the price of securities. As a result, it is impossible for investors to consistently earn higher returns than the overall market through stock selection or market timing.

Core Idea of EMH

According to EMH, prices of securities adjust quickly and accurately to new information. Since all known information is already priced in, only new, unexpected information can cause price changes. Therefore, no investor can consistently "beat the market" using technical or fundamental analysis.

Types of Market Efficiency

1. Weak Form Efficiency

- Prices reflect all past trading information like price history and volumes.
- Technical analysis cannot provide consistent excess returns.
- Fundamental analysis may still offer opportunities in weak form efficient markets.

2. Semi-Strong Form Efficiency

- Prices reflect all publicly available information, including financial reports, news, and economic data.
- Neither technical nor fundamental analysis can consistently beat the market.
- Only new, unexpected information impacts prices.

3. Strong Form Efficiency

- Prices reflect all information, both public and private (insider information).
- No one, including company insiders, can consistently earn excess returns.
- Most markets do not fully meet this level of efficiency in practice.

Implications of EMH for Investors

- Actively managed funds may not consistently outperform passive index funds.
- Investors are better off using low-cost, diversified investment strategies.
- Market anomalies and short-term price deviations may exist but are hard to exploit consistently.

Advantages of EMH

✔ Promotes fair pricing of securities.
✔ Reduces opportunities for manipulation based on insider information.
✔ Encourages investors to focus on long-term, passive investing strategies.

5.1 Portfolio Models - Markowitz Model

Concept of Markowitz Model (Modern Portfolio Theory)

The Markowitz Model, developed by Harry Markowitz in 1952, is considered the foundation of Modern Portfolio Theory (MPT). It explains how investors can build an optimal portfolio by combining different securities to maximise returns while minimising overall risk. The model promotes diversification as the key to reducing portfolio risk without sacrificing expected returns.

Key Principles of the Markowitz Model

✔ Risk and return should be considered together, not in isolation.
✔ Diversification reduces unsystematic risk in the portfolio.
✔ Investors are rational and prefer higher returns for a given level of risk.
✔ Portfolios should be constructed based on statistical relationships like correlation between securities.

Risk and Return in the Model

- **Expected Return:** The weighted average of the expected returns of individual securities in the portfolio.
- **Portfolio Risk:** Measured using standard deviation, considering not only individual security risks but also how securities interact (correlation).

When securities with different risk-return characteristics are combined, the overall portfolio risk can be lower than the individual risks.

Efficient Frontier Concept

The model introduces the concept of the **Efficient Frontier**, a curve that shows the set of optimal portfolios offering the highest return for each level of risk. Portfolios below the frontier are inefficient, while those on the frontier provide the best risk-return combinations.

Assumptions of the Markowitz Model

✔ Investors are risk-averse and seek to maximise returns for a given risk level.
✔ Returns follow a normal distribution.
✔ Investors make decisions based on expected return and standard deviation (risk).
✔ Perfect markets exist, with no transaction costs or taxes.

Advantages of the Markowitz Model

✔ Promotes scientific portfolio construction using mathematical tools.
✔ Encourages diversification to manage risk.
✔ Provides a clear framework for identifying efficient portfolios.
✔ Highlights the importance of considering correlation among assets.

5.2 Efficient Frontier

Concept of Efficient Frontier

The Efficient Frontier is a graphical representation of all possible optimal portfolios that offer the best possible returns for a given level of risk or the lowest risk for a given level of return. It is a key concept from Modern Portfolio Theory, developed by Harry Markowitz.

The curve shows the ideal combinations of different securities where investors can achieve maximum returns by properly diversifying their investments, without taking unnecessary risk.

Understanding the Efficient Frontier

The Efficient Frontier is plotted on a graph:

- The **X-axis** represents risk (measured by standard deviation).
- The **Y-axis** represents expected return.

The curve slopes upwards, showing that higher returns come with higher risk. All portfolios lying on the frontier are considered efficient, while those below the curve are inefficient because they offer lower returns for the same risk.

Inefficient vs. Efficient Portfolios

- Portfolios below the Efficient Frontier are not desirable as they provide lower returns for the risk taken.
- Portfolios on the frontier are optimal, providing the maximum return for each level of risk.
- Portfolios above the frontier are not achievable under normal market conditions.

Investor Choices along the Frontier

- **Risk-averse investors** prefer portfolios on the lower left of the frontier with low risk and modest returns.
- **Aggressive investors** may select portfolios towards the upper right, accepting higher risk for higher potential returns.

Role of Diversification in the Frontier

Diversification helps investors combine different securities to move towards the Efficient Frontier. Properly diversified portfolios reduce unsystematic risk, making the portfolio more efficient.

Advantages of the Efficient Frontier

✔ Helps investors select optimal portfolios.
✔ Encourages diversification to reduce risk.
✔ Visually shows the relationship between risk and return.
✔ Assists in aligning investments with individual risk preferences.

5.3 Sharpe Single Index Model

Concept of Sharpe's Single Index Model

Sharpe's Single Index Model, developed by William Sharpe, simplifies portfolio construction by assuming that the returns of a security are influenced mainly by the market index rather than multiple factors. Instead of comparing every security with each other, this model links individual securities to a single common factor — typically a broad market index like Nifty or Sensex.

The model reduces complexity in portfolio management and helps investors estimate risk and return using fewer calculations compared to the Markowitz Model.

Return Equation of Single Index Model

The model expresses a security's return as:

$$\mathbf{Ri = \alpha i + \beta i \times Rm + ei}$$

Where:

- **Ri** = Return on security i
- **αi** = Alpha, security-specific return (independent of the market)
- **βi** = Beta, measures sensitivity to market movements
- **Rm** = Return on the market index
- **ei** = Unsystematic (firm-specific) risk

This shows that a security's return is a combination of market-related movements and individual company factors.

Components of Risk in the Model

✔ **Systematic Risk:** Related to market factors like economic changes, inflation, or interest rates, captured by Beta.
✔ **Unsystematic Risk:** Company-specific risk, such as management decisions or product performance, represented by ei.

Advantages of Sharpe's Single Index Model

✔ Simplifies portfolio construction by comparing securities to one index rather than to each other.
✔ Reduces computational effort compared to the Markowitz Model.
✔ Helps identify securities with favourable risk-return characteristics.
✔ Separates systematic and unsystematic risk for better decision-making.

5.4 Capital Asset Pricing Model

Concept of Capital Asset Pricing Model (CAPM)

The Capital Asset Pricing Model (CAPM) explains the relationship between the expected return of an investment and its risk. It shows how much return an investor should expect by taking a specific level of risk, compared to a risk-free investment.

CAPM was developed by William Sharpe, John Lintner, and others. It is widely used for estimating the cost of equity, evaluating investment performance, and pricing risky securities.

CAPM Formula

The basic CAPM formula is:

Expected Return (Ri) = Rf + βi × (Rm - Rf)

Where:

- **Ri** = Expected return on the security
- **Rf** = Risk-free return (usually from government securities)
- **βi (Beta)** = Sensitivity of the security to market movements
- **Rm** = Expected market return

CAPM states that investors should earn returns equal to the risk-free rate plus a premium for taking market risk.

Understanding Beta in CAPM

✔ **Beta > 1:** Security is more volatile than the market; higher potential returns and risk.
✔ **Beta < 1:** Security is less volatile than the market; lower returns and risk.
✔ **Beta = 1:** Security moves in line with the market.

Assumptions of CAPM

✔ Investors are rational and risk-averse.
✔ There are no taxes or transaction costs.
✔ All investors have equal access to information.
✔ Markets are efficient, and investors make decisions based on risk and return.
✔ The relationship between risk and return is linear.

Advantages of CAPM

✔ Provides a simple way to estimate expected returns.
✔ Helps in pricing risky assets and making investment decisions.
✔ Useful for calculating the cost of equity in corporate finance.
✔ Considers only systematic risk, which is relevant for diversified investors.

5.5 Concept of Performance Evaluation Using Sharpe Model

The Sharpe Model, developed by William Sharpe, is used to evaluate the performance of investment portfolios by considering both return and risk. It focuses on the **Sharpe Ratio**, which measures how much excess return a portfolio earns per unit of total risk taken.

This method helps investors understand whether higher returns are achieved through efficient management or by taking higher risk.

Sharpe Ratio Formula

Sharpe Ratio = (Rp - Rf) ÷ σp

Where:

- **Rp** = Return of the portfolio
- **Rf** = Risk-free return (usually from government securities)
- **σp** = Standard deviation of the portfolio (total risk)

A higher Sharpe Ratio indicates better risk-adjusted performance, showing that the portfolio earns more return for each unit of risk.

Interpretation of Sharpe Ratio

✔ **Higher Sharpe Ratio:** Indicates efficient portfolio management with better returns for the risk taken.
✔ **Lower Sharpe Ratio:** Suggests poor risk-adjusted performance.
✔ **Negative Sharpe Ratio:** Portfolio underperforms the risk-free return, considered undesirable.

Advantages of Sharpe Model for Performance Evaluation

✔ Measures both return and total risk together.
✔ Helps compare different portfolios on a risk-adjusted basis.
✔ Useful for evaluating portfolios with different sizes and compositions.
✔ Encourages investors to assess efficiency, not just raw returns.
✔ Widely accepted by fund managers, analysts, and investors.

Limitations of Sharpe Model

✖ Assumes returns follow a normal distribution, which may not always happen in volatile markets.
✖ Relies heavily on standard deviation, which does not distinguish between upside and downside risk.
✖ May be misleading if portfolios have different risk profiles or investment styles.
✖ Ignores specific risk sources like systematic vs. unsystematic risk breakdown.

5.6 Performance Evaluation using Treynor Model

Concept of Performance Evaluation Using Treynor Model

The Treynor Model, developed by Jack Treynor, is used to evaluate the performance of investment portfolios by considering systematic risk. Unlike the Sharpe Model, which uses total risk, the Treynor Model focuses only on market-related risk measured by Beta.

The model helps investors understand whether higher returns are achieved through efficient handling of market risk, making it useful for comparing well-diversified portfolios.

Treynor Ratio Formula

Treynor Ratio = (Rp - Rf) ÷ βp

Where:

- **Rp** = Return of the portfolio

- **Rf** = Risk-free return (e.g., from government securities)
- **βp** = Beta of the portfolio (systematic risk)

A higher Treynor Ratio indicates better performance adjusted for market risk.

Interpretation of Treynor Ratio

✔ **Higher Treynor Ratio:** Portfolio is generating higher returns for each unit of market risk taken.
✔ **Lower Treynor Ratio:** Portfolio performance is poor after adjusting for systematic risk.
✔ Treynor Ratio is effective only if the portfolio is well-diversified, as unsystematic risk is assumed to be eliminated.

Advantages of Treynor Model for Performance Evaluation

✔ Focuses only on systematic risk, which cannot be diversified away.
✔ Useful for comparing diversified portfolios, such as mutual funds or index funds.
✔ Helps distinguish between returns earned through market exposure and actual managerial skill.
✔ Simplifies risk assessment by using Beta, a widely accepted risk measure.

Limitations of Treynor Model

✖ Not suitable for poorly diversified portfolios where unsystematic risk is significant.
✖ Requires accurate estimation of Beta, which can vary based on market conditions.
✖ Assumes a stable linear relationship between market returns and portfolio returns.
✖ May not account for extreme market events or non-market-related risks.

5.7 Concept of Jensen's Model (Jensen's Alpha)

Jensen's Model, developed by Michael Jensen, is a popular method for evaluating portfolio performance. It measures the abnormal return, known as **Alpha**, that a portfolio earns over and above the expected return predicted by the Capital Asset Pricing Model (CAPM).

If a portfolio earns higher returns than expected for its level of market risk (Beta), it is considered to have positive Alpha, indicating superior performance due to managerial skill.

Jensen's Alpha Formula

$$\alpha p = Rp - [Rf + \beta p \times (Rm - Rf)]$$

Where:

- **αp** = Jensen's Alpha (Abnormal return)
- **Rp** = Actual portfolio return
- **Rf** = Risk-free return
- **βp** = Portfolio Beta (systematic risk)
- **Rm** = Market return

Positive Alpha indicates the portfolio outperformed market expectations; negative Alpha shows underperformance.

Interpretation of Jensen's Alpha

✔ **Positive Alpha:** Portfolio manager generated returns beyond market predictions, showing superior management.
✔ **Zero Alpha:** Portfolio performed in line with market expectations; no abnormal performance.
✔ **Negative Alpha:** Portfolio underperformed after adjusting for market risk.

Advantages of Jensen's Model

✔ Accurately isolates managerial skill by considering systematic risk.
✔ Based on CAPM, a widely accepted financial model.
✔ Helps investors identify truly outperforming portfolios.
✔ Effective for comparing different investment managers or funds.

Limitations of Jensen's Model

✖ Depends on accurate estimation of Beta, which can vary.
✖ Assumes CAPM is valid, though real markets may not perfectly follow it.
✖ Ignores unsystematic risk, making it suitable mainly for well-diversified portfolios.
✖ Assumes markets are efficient and investors behave rationally.

5.8 Portfolio Revision

Portfolio revision refers to the process of adjusting an existing investment portfolio by adding, removing, or rebalancing securities to align with changing market conditions, risk preferences, or investment objectives. Since markets, economic factors, and personal goals evolve over time, portfolios must be reviewed and revised periodically to remain efficient.

The goal of portfolio revision is to optimise returns, manage risk, and ensure that the portfolio continues to meet the investor's financial targets.

Need for Portfolio Revision

✔ Changes in market conditions like interest rates, inflation, or economic policies.
✔ Fluctuations in security prices affecting the original risk-return balance.
✔ Changes in the investor's income, financial goals, or risk appetite.
✔ Poor performance of specific securities in the portfolio.
✔ Introduction of better investment opportunities in the market.

Techniques of Portfolio Revision

1. Rebalancing the Portfolio

Rebalancing involves realigning the weightage of different assets to maintain the desired asset allocation. For example, if equities grow faster than bonds, selling some equities and buying bonds restores the balance.

2. Switching Securities

Underperforming securities may be replaced with better-performing alternatives. This helps in improving overall returns and reducing risk exposure.

3. Adding or Removing Assets

New investment options may be included, or non-performing assets may be excluded to keep the portfolio updated and efficient.

Advantages of Portfolio Revision

✔ Helps maintain the desired risk-return profile.
✔ Improves performance by eliminating weak assets.
✔ Adapts to changing market dynamics.
✔ Keeps the portfolio aligned with financial goals.
✔ Reduces unsystematic risk through better diversification.

Limitations of Portfolio Revision

✖ Frequent revisions may lead to high transaction costs.
✖ Excessive buying and selling may attract taxes and reduce returns.
✖ Timing the market perfectly is difficult.
✖ Overreaction to short-term fluctuations may disrupt long-term strategy.