JAGAT GURU NANAK DEV
PUNJAB STATE OPEN UNIVERSITY, PATIALA

(Established by Act No. 19 of 2019 of the Legislature of State of Punjab)

The Motto of the University

(SEWA)

SKILL ENHANCEMENT EMPLOYABILITY WISDOM ACCESSIBILITY

CERTIFICATE IN
STOCK MARKET AND TRADING OPERATIONS
Semester-I

GC-CST2: Basics of Security Analysis and Portfolio Management

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The Study Material has been prepared exclusively under the guidance of Jagat Guru Nanak Dev Punjab State Open University, Patiala, as per the syllabi prepared by Committee of Experts and approved by the Academic Council.

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PREFACE

Jagat Guru Nanak Dev Punjab State Open University, Patiala was established in December 2019 by Act 19 of the Legislature of State of Punjab. It is the first and only Open University of the State, entrusted with the responsibility of making higher education accessible to all, especially to those sections of society who do not have the means, time or opportunity to pursue regular education.

In keeping with the nature of an Open University, this University provides a flexible education system to suit every need. The time given to complete a programme is double the duration of a regular mode programme. Well-designed study material has been prepared in consultation with experts in their respective fields.

The University offers programmes which have been designed to provide relevant, skill-based and employability-enhancing education. The study material provided in this booklet is self-instructional, with self-assessment exercises, and recommendations for further readings. The syllabus has been divided in sections, and provided as units for simplification.

The Learner Support Centres/Study Centres are located in the Government and Government aided colleges of Punjab, to enable students to make use of reading facilities, and for curriculumbased counselling and practicals. We, at the University, welcome you to be a part of this institution of knowledge.

Dr. Amitoj Singh
Associate Dean Academic Affairs

CERTIFICATE IN
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Semester-I
GC-CST2: Basics of Security Analysis and Portfolio Management

Max. Marks: 100
External: 70
Internal: 30
Pass: 40%
Credits: 6

SECTION A

Unit I: Security Analysis (Fundamental): Meaning and need of Fundamental Analysis, Factors affecting Economic Analysis, Industry Analysis and Company Analysis;

Unit II: Techniques used in Economic Analysis, Industry Analysis and Company Analysis

Unit III: Security Analysis (Technical): Meaning and need of Technical Analysis; Principles of Technical Analysis.

Unit IV: Theories of Technical Analysis-The Dow Theory, Elliot Wave Theory, Random Walk Theory; Charting Techniques; Market Indicators; Support and Resistance levels; Interpretation of Price Patters; Differences between Fundamental Analysis and Technical Analysis.

SECTION B

Unit V: Portfolio Management: Meaning, definition and significance of portfolio management, Process of portfolio management

Unit VI: Portfolio Theories, Markowiz Model of Risk-Return Optimization; Capital Market Theory; Sharpe Model Index; Capital Asset Pricing Model (CAPM); Arbitrage

Unit VII: Portfolio Evaluation Methods, Portfolio Revision and Rebalancing; Asset Allocation Strategies; Fixed Income Portfolio.

Suggested Reading:

1. Bhalla. V.K. -Management of Financial Services, Anmol Publications Pvt. Ltd New Delhi.
2. Pathak. Bharati, -Indian Financial System, Pearson Education, New Delhi
3. Peter S. Rose C. Hudgins, Hill. (2010). Bank Management and Financial Services 7/e: New Delhi
4. Padmalatha Suresh, Justin Paul, (2010). Management of Banking and Financial Services, 2/e; New Delhi: Pearson Education.
5. S Khan. M.Y.(2013). Financial Services, 7/e; New Delhi: Tata McGraw Hill.
6. Machiraju, H.R (2014). Merchant Banking: Principles and Practice, 4/e: New Ann International.
7. Gurusamy. S.(2013). Merchant Banking and Financial Services, $/e: New Delhi. Tata McGraw-Hill

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CERTIFICATE IN
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GC-CST2: Basics of Security Analysis and Portfolio Management

SECTION A

UNIT NO.	UNIT NAME
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SECTION B

UNIT NO.	UNIT NAME
Unit 5	Portfolio Management: Meaning, definition and significance of portfolio management, Process of portfolio management
Unit 6	Portfolio Theories, Markowiz Model of Risk-Return Optimization; Capital Market Theory; Sharpe Model Index; Capital Asset Pricing Model (CAPM); Arbitrage
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CERTIFICATE IN
STOCK MARKET AND TRADING OPERATIONS
GC-CST2: Basics of Security Analysis and Portfolio Management

UNIT 1- SECURITY ANALYSIS (FUNDAMENTAL)

STRUCTURE

1.0 OBJECTIVES

- To understand basics of Investment
- To understand the meaning and need of Fundamental Analysis,
- To understand the factors affecting Economic Analysis,
- To understand the factors affecting Industry Analysis
- To understand the factors affecting Company Analysis

1.1.1 INTRODUCTION TO INVESTMENT

Investment is the act of putting money into something with the expectation of getting more back over time, usually through profits, interest, dividends, or appreciation in value.

So, Investment = spending money today to grow your wealth in the future.

1.1 Comparing Investment, Speculation, Trading and Gambling:

1. Investment

Investments aim to build long-term wealth by buying quality assets that grow in value over time.

- Timeframe: Long-term (years or decades)
- Risk: Moderate, with research and diversification
- Decisions based on: Fundamental analysis (company value, financials, economic trends)
- Examples: Buying shares of Apple for the long haul, investing in real estate or mutual funds.

Investors aim to own good businesses, not just ride price moves.

2. Speculation

The goal of speculation is to make high returns by taking bigger risks, often on price movements or future events.

- Timeframe: Short to medium-term
- Risk: High, often based on uncertain outcomes
- Decisions based on: Market trends, news, hype, or predictions
- Examples: Buying a penny stock hoping it will 10x, betting on a biotech firm before FDA approval.

Speculators care less about value and more about what might happen.

3. Trading

Trading focuses on profit from short-term price movements using technical analysis or market patterns.

- Timeframe: Very short-term to medium (minutes to weeks)
- Risk: High, but can be managed with tools like stop-loss orders
- Decisions based on: Technical analysis, price action, charts, indicators

- Examples: Day trading, swing trading, scalping crypto or forex markets

  Traders use strategies and tools to time entries and exits. It's more skill than luck, but very active.

4. Gambling

Gambling aims at winning money by risking it on uncertain outcomes, usually pure chance or a minimal edge.

- Timeframe: Instant or very short
- Risk: Extremely high (all or nothing)
- Decisions based on: Luck, chance, or emotion
- Examples: Playing slots, roulette, betting on sports without research, or investing in a meme stock with no analysis.

  Gambling has a negative expected value—long term, the house usually wins.

1.1.2 Investment Avenues available in India

1. Bank-Based Investments (Low Risk)

Investment	Features
Savings Account	Very low returns (~3–4%), high liquidity
Fixed Deposits (FDs)	Stable returns (~5–7%), capital safety
Recurring Deposits (RDs)	Monthly investment + fixed returns
Public Provident Fund (PPF)	Govt-backed, tax-free returns (~7.1%), 15-year lock-in

2. Stock Market (High Risk – High Reward)

Investment	Features
Equity Shares	Ownership in companies, potential for high returns
Mutual Funds	Professionally managed, comes in types like Equity, Debt, Hybrid
Exchange-Traded Funds (ETFs)	Low-cost, index-based investing (e.g., Nifty 50 ETF)
SIPs (Systematic Investment Plans)	Regular investment in mutual funds; great for beginners

3. Government Schemes

Scheme	Features
National Savings Certificate (NSC)	Safe, tax-saving, fixed interest
Sukanya Samriddhi Yojana (SSY)	For girl child, high interest (~8%+), tax-free
Senior Citizen Saving Scheme (SCSS)	For those 60+, higher interest than FDs
RBI Bonds	Issued by RBI, 7.5% interest (subject to change), 7-year lock-in

4. Real Estate

- Investment in property (residential/commercial)
- Rental income + appreciation
- Requires higher capital, low liquidity, but tangible asset

5. Gold & Precious Metals

Type	Features
Physical Gold	Jewellery, bars, coins (storage & safety issues)
Gold ETFs / Sovereign Gold Bonds	No physical storage, interest + gold price return
Digital Gold	Buy gold online in small quantities

6. Debt Instruments (Low to Medium Risk)

Investment	Features
Corporate Bonds & NCDs	Higher returns than FDs, slightly riskier
Debt Mutual Funds	Invests in govt/corp. bonds, good for stability
Tax-Free Bonds	Issued by govt-backed institutions, no tax on interest

7. Alternative Investments

Type	Examples
Start-ups/Private Equity	Investing in early-stage companies
REITs (Real Estate Investment Trusts)	Real estate without owning property

Type	Examples
Crypto Assets	Very high risk, highly volatile
P2P Lending Platforms	Lending money to individuals for interest, risky but high yield

8. Tax-Saving Investments (under Section 80C)

Type	Limit	Lock-in
ELSS (Equity Linked Saving Scheme)	₹1.5 lakh	3 years
PPF	₹1.5 lakh	15 years
NSC	₹1.5 lakh	5 years
Life Insurance Premium	₹1.5 lakh	Varies

The present lesson deals with investment in stock market instruments, especially equity shares. The terms equity shares, securities, stocks are used interchangeably. In this paper we will learn to analyses securities, so as to understand which security to invest in and when to make a transaction (whether to buy or sell a security) in the market. There are basically three different schools of thought regarding security analysis, which are:

- Fundamental Analysis, which includes a three-tier analysis of Economy – Industry – Company, to reach at an Intrinsic value (should be value) of the share, which is then compared with the actual market value of the share to make a buy or sell decision.
- Technical Analysis, which deals with studying trends and patterns in the historical prices and volume data to make future predictions in price movements of individual stocks or movement in the market as a whole.
- Efficient Market Hypothesis, which divides the market into three forms of market efficiency on the basis of information availability with the investor. The three forms are named as weak form of market efficiency, semi strong form of market efficiency and strong form of efficiency.

In this unit we will focus on Fundamental Analysis.

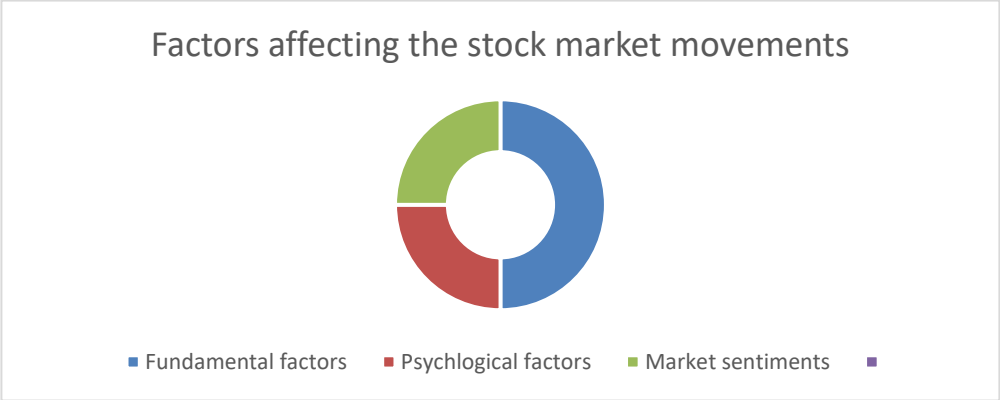
1.1 FUNDAMENTAL ANALYSIS:

The fundamental analysis focuses on the intrinsic value of a share/security. A fundamental analyst determines the price at which an investor is willing to invest and then turns to the market in order to find out whether or not the Security is selling at the required price. The intrinsic or theoretical value of a Security depends primarily on it earning potential which further depends on fundamental factors like the quality of management, industry and economy outlook, Company's further prospects, etc. By carefully studying and analyzing such factors, an analyst can determine whether the

actual market price of a security is above or below its intrinsic value. The prevailing market price of a security may differ from its intrinsic value due to changing market conditions and the resultant change in investor expectations. However, the fundamentalists maintain that the intrinsic/theoretical value of a security is its equilibrium price and any deviation from it is a short run phenomenon, thus implying that the actual price of a security would always move towards the intrinsic value of the security. It actual prices tend to move towards intrinsic value, then attempting to determine the intrinsic value of a security is equivalent to making a prediction of future price and this is the essence of predictive procedure implicit in fundamental analysis.

Another possible cause for the non-matching of actual price and intrinsic value of a security is a less than complete dissemination of information and varying interpretations of such information. Nevertheless, according to the fundamentalist school of security valuations if the actual price of a security is more than its intrinsic value, then it would be beneficial for an investor to sell that security' as the actual price would tend to fall towards intrinsic or the equilibrium value. On the other hand, if actual price happens to be below the intrinsic value of that security, it would be nice to buy that security as the price would be expected to move up towards the intrinsic value.

It is also to be noted that the movements in stock markets are not solely based upon the fundamental factors. The investor's psychology and market sentiments also play a vital role in the activities that take place in the stock markets.



The figure given above indicates that fundamental factors contribute around half of the effect on the stock market movements as compared to other market related factors.

As observed earlier, the fundamental. Analysis is basically concerned with the study of fundamental factors related to the economy, industry and the company under

question. The fundamental analysis is basically concerned with EIC study namely. Economic, industry and company study. These factors are taken into consideration while calculating the intrinsic value. These factors are discussed in detail in the following paragraphs:

1.2 ECONOMIC ANALYSIS:

It is important to predict the changes in national economy because economic activity affects corporate profits, investor's attitudes, expectations and ultimately the security prices. An outlook of sagging economic growth can lead to lower corporate profits, a prospect that can engender investor pessimism, and lower security price. The key for an analyst is that overall economic activity manifests itself in the behavior of stocks. For any investor, the anticipated economic environment and therefore the economic Forecast, is important for making decisions concerning both the timing of an investment and the relative investment desirability among the various industries in the economy. There are certain major economic forecasting techniques (discussed in detail in next unit) such as

(i) Anticipated surveys.
(ii) Indicator/Barometric. Approach.
(iii) Diffusion index.
(iv) Econometric models.
(v) Opportunistic models.

Common to all forecasting techniques is an understanding of the national income and product accounts which summaries both the receipts and the expenditure of all segments of the economy whether government, business, or personal. The total of final expenditure must equal the total of receipts in the economy.

1.3.1 Factors of Economic Analysis:

There are some pertinent factors that affect the economic condition of a country, which are discussed below:

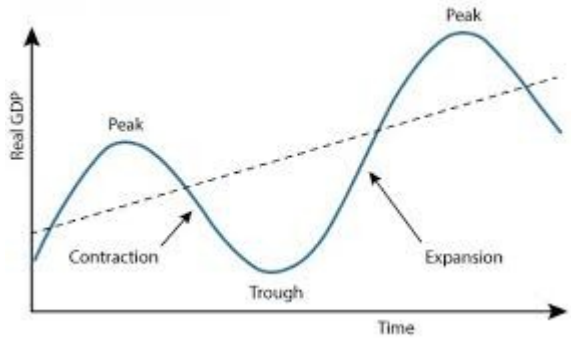
1) **Economic stability:** The stability of any economy is determined by the growth rate in its national income. The most common proxy for measuring national income of a country is Gross Domestic Product (GDP). GDP is a measure of the total monetary value of all final goods and services produced within a country's borders in a specific period, usually a year. Some other variants of national income can be understood as follows:

Gross National Product (GNP) = Gross Domestic Product (GDP) + Foreign Income

Net Domestic Product (NDP) = Gross Domestic Product (GDP) - Depreciation

The variants of national income can be compared across similar countries or over time to have an idea of the comparative scenarios as well as trends in the economic conditions of a country

2) **Political stability:** A government will be considered stable if it has come into power with majority. A coalition government is formed if no one party is in majority and the government is formed by joining of two or more parties. Obviously, a stable government is in a better position to make policies and implement laws, which can be a favorable condition for many industries and various sectors of the economy.
3) **Monetary policy**: Monetary policy of an economy deals with the management of flow of money in the economy. The flow of money in the economy directly affects the inflationary or deflationary conditions in the economy. So, to control the money flow in the economy, the central bank of India i.e. RBI adjusts various instruments like Cash Reserve Ratio (CRR), Statutory Liquidity Ratio (SLR), Repo Rate, Reverse Repo Rate, Bank Rate, etc. For example, Cash Reserve Ratio (CRR) is the percentage of a bank's deposits that it must keep with the Reserve Bank of India, and increasing CRR would mean less amount with the commercial banks at their disposal to give loans to general public, and thus the supply of money in the economy will be curtailed. This strategy can be used in times when the inflation rate is rising. Similarly, other instruments can be used to adjust money supply and thus inflation or deflation in the economy. So, a healthy and robust monetary policy is surely a sign of healthy economy.
4) **Fiscal policy**: Fiscal policy deals with the government revenue and spending. The major source of government revenue is taxation. So, the decision about tax structure, tax holidays, tax concessions, etc. is all under the preview of fiscal policy. Further, the decisions about government spending on various sectors of the economy are also the part of fiscal policy. Thus, such decisions will be directly affecting issues like job growth, inflation, sustainable growth of various sectors and the economy as a whole, resource allocation etc.
5) **Business and economic cycles**: The economic cycles in an economy can be understood by the figure given below:



The figure clearly depicts various stages of economic activity. The expansion or boom stage in the economy is characterized by conditions like full employment, high

profits, rising production, consumer spending etc. The peak stage signifies the highest point of activity in an economy. Then, the contraction or recession stage is the stage of a declining economic activity with falling production, rising unemployment, declining consumer spending etc. The trough stage is the lowest point of economic activity. So, such cycles in the economy continue to exist with varying amplitude and time horizon. For an analyst, it is very important to verify and explore the stage of the economic cycle, which the economy is going through. Obviously, from in investor's prospective the expansion stage is ideal for investing and growing with the economy.

6) **Capitalistic Vs. socialistic economy**: Capitalism emphasizes private ownership, free markets, and profit-driven production, while socialism prioritizes state or public ownership, central planning, and social welfare. So, the attitude of government is very crucial in this regard. Both the economies have their own inherent benefits and problems. To create a balance between the two there is a concept of mixed economy, which is prevalent in most of the economies. From the investors' point of view, obviously the capitalistic economy would be a better investment situation. So, an investor must observe as to where the tilt is – towards capitalism or socialism.
7) **Stock markets**: An analyst can also have a sharp eye on the stock markets to have a idea of the prevailing economic health of the country. The stock markets and the economy go hand in hand. A healthy economy indicates a strong stock market and vice versa.
8) **International economic factors**: A vigilant investor would prefer to diversify its investments not only within the country but outside the country also. So, to make investments and transactions in other counties, an analyst must understand the international economic factors, such as geo-politics, international relations, role of international institutions and agencies, exchange rates, etc.
9) **Demographic factors**: The demographic factors of a nation also give a strong insight into the economic growth prospects. For example, a greater number of female workforces joining the industry or higher number of young manpower in the country are the clear indication of a growing economy.
10) **Natural factors**: Nature also plays a role in the health of a nation's economy. India being an agrarian country, monsoon plays a vital role in the agriculture yield and thus national income. Similarly, situations like floods, famine, wars etc. would also adversely affect the national income prospects and would lead to a dwindling economic state.

CHECK YOUR PROGRESS:

I. Investment is long term and trading is short term True/False
II Intrinsic value is the actual value of the share True/False

III **The top-down approach in fundamental analysis starts with:**

A) Company analysis
B) Industry analysis
C) Economic analysis
D) Management analysis

IV GDP = GNP – Foreign Income True/False

V **What is the primary goal of economic analysis in fundamental analysis?**

A) To predict exchange rates
B) To assess the health of a company
C) To understand the macroeconomic environment
D) To find arbitrage opportunities

1.4 INDUSTRY ANALYSIS:

For an analyst, industry analysis demands insight into (a) the key sectors or sub divisions of overall economic activity that influence particular industries, and (b) the relative strength or weakness of particular industry or other groupings under specific sets of assumptions about economic activity.

1.4.1 Classification of Industries:

Webster's Dictionary defines an industry as; a group of productive or profit-making enterprises or organizations that have a similar technological structure of production and that produce or supply technically substitutable goods, services, or sources of income. Industries are broadly classified into the following categories

1. Industry classification by product.
2. Industry classification according to Business Cycle.
3. Industry classification according to process.

1.4.1.1 Industry Classification by Product

It is not easy to pinpoint an industry and the investigator needs to have a clear goal in mind so that he can properly classify firms into industries for his specific purpose e.g. if the goal were to reach an estimate of sales for the industry, the analyst might want to consider similar products and products that could be substituted for the item in question Industry classification by product does not present any acute problem for an expert analyst when he is classifying firms with basically one product or a homogeneous group of products, The problem arises when he deals with a firm that has a diversified product line.

1.4.1.2 Industry Classification According to Business Cycle:

This classification is based on how the industries react to upswings in the economy. The industries according to this classification are grouped

(a) Growth industries: It include those industries that are characterized by of abnormally high rates of expansion in earnings and are often independent of the business cycle.

(b) Cyclical industries: Such industries usually thrive during a period of economic prosperity and suffer in the period of economic recession,

(c) Defensive industries: There are certain firms whose securities are held for income by the investor. Such firms constitute the defensive industry. Generally, such industries produce items of necessity. The earnings of the firms in this industry might expand even in the time when the earnings of cyclical Therefore, this industry may be considered counter cyclical

1.4.1.3 Industry classification according to Process:

If an analyst desires to compute comparative costs of the make sense to consider only those firms which have identical manufacturing processes, e.g. an analyst can compare the cost of one television producer with the other with that of a manufacturer of oil products.

An investment analyst can procure much of the relevant data for analysis purpose from many industrial associations like

- The Federation of Indian Chambers of Commerce and Industry (FICCI)
- The Confederation of Indian Industry (CII)
- National Association of Software and Services Companies (NASSCOM)
- PHD Chamber of Commerce and Industry (PHDCCI)
- Associated Chambers of Commerce & Industry of India (ASSOCHAM)
- All India Manufacturers' Organization (AIMO)
- Indian Industries Association (IIA)
- Indian Drug Manufacturers Association (IDMA)

1.4.2 Stages in industry life cycle:

The industry life cycle is characterized by three stages:

l. The Pioneering Stage.

2. The Expansion Stage.

3. The Stagnation Stage.

1.4.2.1 The Pioneering Stage: This stage is characterized by rapid growth in demand for output of the industry. It is the earliest stage in which demand grows at an

increasing stage. Production rises and the profits are also very high at. this stage. Tempted by profits many new firms enter the field making the market competitive. All firms compete with each other but most of them are wiped out in this stage and only a few efficient firms are left in the industry.

1.4.2.2 The Expansion Stage: The firms that survive from the pioneering stage appear in expansion stage. Their competition in the expansion stage usually brings about improved products at a lower price. The firms continue to expand, but their rate of growth become moderate as compared to the pioneering stage. The investors find it the best time to make an investment. At this time the firms begin to expand themselves through external means of financing such as loans, public issue of shares etc. and through internally generated funds

The expansion stage is the period of safety and security and is also called period of maturity for the firm.

1.4.2.3 The Stagnation Stage: In this stage the sales increase but at a decreasing rate. The transition from the maturity to the stagnation stage is very gradual; therefore, it fails to get into the notice of the owners of the firm. During this stage most of the firms in this industry are again wiped away. The few that survive change their course of action and start a new venture. In this stage, the investors should make continuous evaluation of their investments.

It is very important for an investment analyst to know, that a particular industry under scanner lies in which stage of the industry life cycle. From the investor's perspective the expansion stage is the most apt stage for investment purpose, because the wealth of the investor grows with the growth in the industry. The pioneering stage is very risky for investment purpose as the risk of its existence hovers over the investor's head. In stagnation stage the industry has reaped all that it was capable of and now the growth prospects are very small.

1.4.3 Important factors of industry analysis:

The characteristic of industrial growth begins with certain important factors

1) **Permanence of Technology**: Technology keeps on changing, e.g. fountain pens have way to ball pens. A product with frequent technological changes may be useful investor to notice as product obsolescence may erode his investment.
2) **Competition:** The second factor which an investor must consider in making Industrial analysis is to enquire about the type of competition that an industry has in the country. There are some barriers to enter in an industry, which make the competition stiff, like
   - Product differentiation
   - Absolute cost advantage
   - Economies of scale

3) **Economic Environment**: Poverty in country would have an economic condition where cheaper products would be sold and demand for these products will be higher. Economically advanced country will have customer activity in higher price and better-quality products.
4) **Past sales and earnings performance**: The analyst can look into the financial parameter like past sales records, market share, EPS over years and across companies to have an insight into the industry financial and operational health. The cost structure of the industry is also a relevant parameter for the analyst. More the fixed cost component is there in the cost structure, higher will be the break -even point of that industry.
5) **Government's attitude towards an industry**: What is the attitude of a state or central government towards the industry is a very important factor to be considered while choosing an industry for investment purpose. Policies regarding Taxation laws, tax concession, special economic zones, legal formalities, pollution laws etc. are to be studied before choosing an industry.
6) **Labor conditions**: There are labor intensive industries, which rely more on skilled manpower, and there are capital intensive industries, which are based on hi-tech technological equipment. It may be noted that a situation of strike arising in a capital-intensive industry is riskier as so much of fixed cost is locked in, as compared to a labor-intensive industry.
7) **P/E comparisons**: P/E multiplier is the ratio of Market Price of Share (MPS) to Earnings Per Share (EPS). A higher P/E multiplier would indicate higher investors' expectations from the industry for future growth. Whereas, a lower P/E ratio would mean the industry is undervalued. The other side of the coin is that industry with higher P/E ratio is overvalued and their price is not correct according to their current earnings.
8) **Raw material and inputs**: an analyst also must look into the availability of raw material and price at which the raw material and other required inputs are available.
9) **Industry characteristics**: Basic characteristics of the industry should also be understood to better understand the industry as a whole like, whether the industry is seasonal in nature, or industry caters to a particular region. What are the power and fuel requirements to operate the industry? Answers to such questions will help in better understanding the nature of the industry.
10) **Market structure**: what type of market structure prevails for the industry is also a matter of concern for the analyst. Whether the market is a perfect one or there is monopoly, oligopoly or monopolistic competition in the market? What is the interference level of the government in the fixing prices for the industry? What are the demand and supply conditions of the market? These questions must be dealt with before finalizing an industry.

CHECK YOUR PROGRESS:

VI An investor should invest in pioneering stage of industry life cycle True/False

VII **What is the main objective of fundamental analysis?**

A) To predict short-term price movements
B) To determine a stock's intrinsic value
C) To analyses past price patterns only
D) To identify arbitrage opportunities

VIII **A cyclical industry is one that:**

A) Performs well in recessions
B) Is unaffected by economic changes
C) Moves in line with the business cycle
D) Only includes technology companies

IX **Which of the following is NOT a component of fundamental analysis?**

A) Economic analysis
B) Industry analysis
C) Technical indicators analysis
D) Company analysis

X **Which of the following is an example of a leading economic indicator?**

A) GDP growth rate
B) Unemployment rate
C) Inflation rate
D) Stock market indices

1.5 COMPANY ANALYSIS:

Company analysis is the third tier of the fundamental analysis after the economic and company analysis. It is the company analysis which helps the investment analyst to finally reach at the intrinsic value of the share, about which we have been discussing since the start of this unit. The intrinsic value which is to be compared with the actual market value of the share is reached with the help of various techniques used in the company analysis, which will be discussed in detail in the next unit. In this unit we will try to understand some factors which must be studied before finalizing a particular company to be included in the investment portfolio.

1.5.1 Factors affecting company analysis

1) Financial parameters: Obviously, the financial health of the company is the most

crucial aspect, an investor would like to study and understand. Various tools like common size statements, ratio analysis, cash flow statements, profitability position, solvency position, liquidity position, operational efficiency, etc. are used to gauge the financial position of the company. Financial statements like balance sheet and income statement are the main source of raw data on which these tools are applied.

2) Industry and market trend: The company will ultimately be a pert of the industry. So, the health of the overall industry is also to be considered before assessing the company itself. Overall market analysis is also to be taken up to see the change in technological advancements, consumer preferences, industry dynamics, etc. A detailed SWOT analysis can be performed to understand the relative position of the company as compared to the peers in the industry.
3) Management quality: The composition of board of directors is another crucial element to be studied by the investment analyst. The experience and track record of the directors and mangers, their gender composition, their skill sets, their qualifications, and their demographics can be looked into to have an understanding of management capabilities. The leadership qualities of the managers and directors as well as their strategic vision are the key qualities that can lead the company to new heights.
4) Company culture: The culture that has been developed and is presently prevailing in the organization will be a crucial factor to understand company's future growth potential. Factors like valued and norms, ethical standards and practices, employee satisfaction and motivation, workplace environment are to be evaluated to get an insight into the cultural atmosphere in the organization.
5) Other factors: Other factors like company's aptitude to adapt new technological advancements, stakeholder's relationships, raw material availability, government policies etc. must not be ignored by an investment analyst while performing company analysis.

CHECK YOUR PROGRESS:

XI **In fundamental analysis, qualitative factors include:**

A) Cash flow statements
B) Balance sheet ratios
C) Management quality
D) Inventory turnover

XII **Which of the following is considered a qualitative factor in company analysis?**

A) Return on assets (ROA)
B) Debt-to-equity ratio
C) Strength of the brand
D) Current ratio

XIII **A company with strong corporate governance is likely to:**

A) Avoid public disclosures

B) Have weak internal controls

C) Build investor trust and transparency

D) Prioritize short-term speculation

XIV **Why is management quality important in qualitative analysis?**

A) It determines bond prices

B) It influences market liquidity

C) It affects strategic decisions and long-term performance

D) It sets the stock exchange regulations

XV **Which of the following best represents a qualitative risk in company analysis?**

A) Rising interest rates

B) Change in accounting policy

C) Poor reputation due to a scandal

D) Decline in inventory turnover

1.6 LET US SUM UP

Investment is outlay of money today for a growth in that money tomorrow. Investment can be in real assets as well as in financial assets. Security analysis deals with investment in financial assets, especially in equity shares. One of the approaches of security analysis is called – Fundamental analysis. Fundamental analysis deals with Economy-Industry-Company analysis to reach at an intrinsic value of the share, which is the value of the share it must hold as per its fundamental factors. This intrinsic value is then compared with the actual market value of the share to make buy or sell decision.

The economic analysis deals with studying various parameters of an economy, such as national income, role of government, monetary and fiscal policy etc. to gauge the economic health of a nation. After looking into the overall economic scenario, the focus is shifted towards a particular industry. Factors like permanence of the industry, government attitude, earnings and sales trends in the industry, labor conditions etc. are studied to analyses the industry's growth potential in future. Finally, the focus is moved towards the particular company of interest where the investment is to make. Company is analyzed for its past financial and operational efficiency, and some qualitative factors like board composition and organization culture.

1.7 KEYWORDS

- **Intrinsic value**: the value a share must hold as per its fundamental factors is called

intrinsic value.

- Gross Domestic Product (GDP): GDP is a measure of the total monetary value of all final goods and services produced within a country's borders in a specific period, usually a year.
- Monetary policy: Monetary policy is a macroeconomic tool used by central banks to manage the money supply and interest rates in an economy, aiming to influence factors like inflation
- Fiscal policy: Fiscal policy refers to the use of government spending and taxation to influence a nation's economy.
- Industry life cycle: The industry life cycle describes the stages an industry goes through, from its introduction to its eventual decline.
- P/E Multiplier: The price-earnings (P/E) ratio, also known as the price-earnings multiplier, is a financial metric that compares a company's stock price to its earnings per share (EPS).

1.8 ANSWERS FOR CHECK YOUR PROGRESS

Question No.	Answer	Question No.	Answer	Question No.	Answer
I	T	VI	F	XI	C
II	F	VII	B	XII	C
III	C	VIII	C	XIII	C
IV	T	IX	C	XIV	C
V	C	X	D	XV	C

1.9 TERMINAL QUESTIONS

Q1. Discuss various investment avenues available for an aspirant investor.

Q2. 'A fundamentalist performs a three-tier analysis and reaches at an Intrinsic Value of the share, which aids him in deciding whether to buy or sell.' Explain

Q3. What factors a fundamental analyst must consider while choosing an industry for investment?

Q4. What factors an investor must consider to understand if an economy is suitable for his investments to grow?

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UNIT 2- TECHNIQUES USED IN ECONOMICS ANALYSIS

STRUCTURE

2.0 OBJECTIVES

- To understand the techniques for conducting Economic Analysis,
- To understand the techniques for performing Industry Analysis
- To understand the techniques for carrying out Company Analysis

2.1 INTRODUCTION

In the previous unit we have learnt about basics of fundamental analysis and about factors that an investment analyst must consider while performing Economy-Industry-Company analysis. In this unit we will focus on techniques of conducting this analysis at three tiers of fundamental analysis i.e. Economy, Industry and Company.

2.2 TECHNIQUES FOR ECONOMIC FORECASTING:

Economic analysis is the first stage of fundamental analysis. Economic analysis starts with understanding past performance of an economy by studying various factors affecting the economy. But, more important task of economic analysis is to forecast the future activity in the economy and trying to predict the trend that will take place in the future. As discussed in the previous unit the most important representation of

economic activity is the national income. Various measures of national income are prevalent; most commonly used being Gross Domestic Product (GDP). GDP is the amount of goods and services produced within the borders of a country. If we add foreign income to it, it becomes Gross National Product (GNP). And if we deduct depreciation from GDP, it becomes Net Domestic product (NDP).

So, the techniques we are going to discuss in the ensuing paragraphs, will primarily focus on the forecasting of national income and thus the projected economic activity.

1) **Anticipatory surveys**: It includes conducting of surveys among the experts like leading economists, industrialists, journalists, prominent government officials etc. to build a general opinion about the future economic activity. The varying opinions of the experts are then synthesized to get a unified opinion on the future economic overview. Such experts in the field can be contacted through questionnaires and interviews - structured or unstructured. The most prominent drawback of this technique is the subjectivity and the bias in the opinions of the experts.

   A survey of consumers regarding their plans for future spending an investment intension can also be conducted to have an idea of the possible future economic activity. Similarly, the producers can also be surveyed for their investment plans, plans of capital expenditure, plans of anticipatory levels of inventory etc. to have an idea of the future state of economy. But such surveys are based only on intentions and not on actual spending or investment. So, who knows whether these intentions will translate into action or not.

2) **Barometric or indicator approach**: In this approach various economic indicators are studied to understand the future economic activity. Firstly, a historical time series data of such variables are collected. Then interrelationships among these variables over a period of time are studied and indicators are segregated into leading, coincidental and lagging.

- Leading indicators are those which reach at their peak or the low points in advance to the total economic activity.
- Coincidental indicators are those which reach their highest or lowest points at almost the same time as that of total economic activity.
- Lagging indicators are those variables that reach their highest or lowest points after some time of the total economic activity has taken their turning points.

The US department of Commerce, through its Bureau of Economic Analysis, has prepared a short list of these indicators. Some of them are given below:

Leading indicators

- Average weekly hours of manufacturing production workers
- Initial unemployment claims
- Contract and orders for plant and machinery

- Number of new building permits issued
- Index of S&P 500 stock prices
- Money supply (M2)
- Change insensitive materials prices
- Change in manufacturers' unfilled orders (durable goods industries)
- Index of consumers' expectations

Coincidental indicators

- Employees on non-agricultural pay rolls
- Personal income less transfer payments
- Index of industrial production
- Manufacturing and trade sales

Lagging indicators

- Average duration of unemployment
- Ratio of manufacturing and trade inventories to sale
- Average prime rate
- Change in consumer price index for services
- Commercial and industrial loans outstanding

Of these, the leading indicators are most useful for an investment analyst as their movement can be tracked to forecast future economic activity. For example, the past data shows a growth in the national income one month after the rise in money supply. So, if the money supply goes up, a prediction can be made that national income will go up in the coming month.

This approach too has certain limitations. This approach will only talk about the direction of change, but not about the magnitude or duration of change. Moreover, different indicators may give conflicting signals. This approach will give results only if timely data analysis and presentation is done. Delay in analysis will lead to misleading results.

3) **Regression analysis**: Regression is a statistical technique which measures the probable effect of multiple *independent variables* on a *dependent variable.* A multiple regression equation is formed on the bases of past date of the variables under consideration.

A multiple regression equation will look like:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \dots$$

Where, Y is the dependent variable

X1, X2, X_3 are independent variables

α is the intercept of the regression line

β is the slope of regression line or the change that a particular independent variable causes in the dependent variable

Once such regression equation is formed, it can be effectively used to forecast the dependent variable by changing the values of the independent variables. For example, an analyst can take GNP as it's dependent variable and other variables like money supply (MS), inflation (I), industrial production index (IPI), etc. as independent variables. Suppose after running regression on the available past data, the following hypothetical regression equation is formed:

$$GNP = 10.5 + 55.6 * MS + 23.5 * I + 45.8 * IPI$$

Inserting the desired values of independent variables in the equation can give probable forecasts of the GNP.

Regression can also be applied on time series data, where time will be the independent variable. Using such time series regression equation the past trend can be extrapolated into the future. For example,

$$GNP = 11.3 + 45.6 * t$$

In this equation't' is the time lag. So, putting value for any future time period at t's place will give probable forecasts of GNP.

4) **Econometric model building**: Econometrics is a set of techniques which are used to solve complex economic models using advanced statistical methods. In the previous technique i.e. regression we have used a single model consisting of dependent and independent variables in an equation form. Econometric model building is used when we have multiple models, each having a different equation and the variables are interdependent. When all these model equations are to be solved simultaneously, econometric techniques are used. So, a complex model having multiple equations can be solved using this technique to get precise and reliable forecasts.

   The accuracy of the results depends upon the validity of the assumptions taken and the accuracy of collected data. Econometric models are very complex in nature and difficult to solve. Vast amount of data is to be collected and multiple equations or to be solved simultaneously. This consumes a lot of time and energy. But nowadays computers have made the task easy and feasible. Much software has been developed to solve such models. Only the input data is to be provided to the software a rest of the task is done by the software itself.

5) **Opportunistic model building**: This technique uses two sets of GNP forecasts – one on the basis of GNP model building and other on the basis of components of GNP. In the first set a model is developed to forecast demand and thus GNP on the basis of different variables like, economic environment, tax rates, inflation, interest rates etc. in the second set the GNP figure is reached by adding up its components – *firstly,* consumption expenditures, *secondly,* gross private domestic investment, *thirdly,*

government purchases of goods and services and *fourthly,* net exports.

Then these two sets of forecasts are compared with each other and necessary adjustments are made to reconcile the forecasts and reach at a more realistic and reliable GNP forecast. The method is complex and investor judgment and knowledge is required for accurate forecasts. No method is fully accurate and the investor must evaluate all alternatives critically before making his final investment decision.

CHECK YOUR PROGRESS

I. Regression analysis evaluates multiple model equations True/False

II. Leading indicators are most useful for an analyst True/False

III. **An economy is said to be in recession if:**

A) Prices are consistently rising

B) GDP falls for two or more consecutive quarters

C) Interest rates rise sharply

D) Exports increase

IV. **Which of the following factors is considered in economic analysis?**

A) Profit margins

B) Corporate governance

C) Inflation trends

D) Market share

V. **Which type of analysis involves studying macroeconomic factors?**

A) Technical analysis

B) Economic analysis

C) Sentiment analysis

D) Chart analysis

2.3 TECHNIQUES FOR EVALUATING INDUSTRY FACTORS:

1) **End-use analysis**: End-use analysis, or product-demand analysis, refers to the process whereby the analyst or investor attempts to diagnose the factors that determine the demand for the output of the industry. It involves knowing how resources are used rather than knowing just about the demand of that resource. It is looking at the 'why' behind consumption of any resource. For example, knowing why the water is used for washing clothes or washing utensils by a household. This analysis will help to forecast demand for a particular product in the industry and thus the potential of that industry.
2) **Regression Analysis**: A simple linear regression analysis mathematically fits a line to a series of points on a scatter diagram, and co-relation analysis permits us to measure the "goodness of the fit". As in the case of economic analysis, in industry analysis too regression can be used to forecast many variables of interest like demand/sales for a product or future earning potential of the industry.
3) **Input-Output Analysis**: input-output reflects the flow of goods and services through the economy. It observes patterns of consumption at all stage. It helps to understand how the output of one industry is an input for another industry. This technique was developed by Wassily Leontief and focuses on measuring impact of changes in one industry on the other. So, this analysis will help an investor understand the linkages among industries and provide a composite scenario of the industries.
4) **Competitive Forces Model**: this model was proposed by Michael Porter and tries to understand the competitiveness and profitability of an industry. Porter suggests five forces that outline competition:

- The threat of new entrants
- The bargaining power of suppliers
- The bargaining power of buyers
- The threat of substitute products or services
- The rivalry among existing competitors

This model will help an investor understand the scenario of competition for a particular industry and the probable market share of that industry.

5) **PEST Analysis**: A PEST analysis is a strategic planning tool that assesses the external environment of a business by examining Political, Economic, Social, and Technological factors. An investment analyst can use this analysis to understand the environment in which the industry is operating and the future growth prospects of that industry.
6) **SWOT analysis:** SWOT analysis stands for Strength, Weaknesses, Opportunities and Threats. An investment analysis must perform such analysis on an industry to better understand the underlying strengths and weaknesses of the industry as well as the opportunities that the industry has to grow and the threats that stop that industry to grow. This will help the investor understand the industry dynamics in depth.

CHECK YOUR PROGRESS:

VI. Competitive forces model was proposed by Michael Porter True/False

VII. MM model assumes irrelevance of dividends True/False

VIII. **In industry analysis, Porter's Five Forces framework is used to:**

A) Analyse company financials

B) Forecast GDP

C) Evaluate industry attractiveness

D) Predict stock prices

IX. **Which factor is least likely considered in industry analysis?**

A) Competitive rivalry

B) Bargaining power of suppliers

C) Earnings per share

D) Threat of new entrants

X. **In industry analysis, understanding barriers to entry helps in assessing:**

A) Supply chain costs

B) Ease with which new competitors can enter

C) Profitability of existing firms

D) Government tax policies

2.4 TECHNIQUES FOR COMPANY ANALYSIS

2.4.1 Valuation Models

Some of the models developed by the fundamental school of thought are discussed in the ensuing paragraphs. Most of them strive to explore the Controversial and unresolved relationship between dividend and market price of shares.

1. Tinbergen Model:

According to this model, the market price of a security is a function of long-term interest rates, dividend yield on normal investment and the rate of change in the price

of the Security.

Thus,

P = f (a, b, c)

Where,

P = Market price of a share
a = Long term interest rates
b = Dividend yield on normal-investment.
c = Rate of change in Share price.

The Tinbergen model shows, that the prices of shares vary directly with dividend yield and inversely with the rate of interest. This method of determining the share price is quite akin to the measurement of debenture prices.

2. William's model:

William Considered the Share price to be dependent on the expected rate of return over a period of time and an appropriate rate of discount.

Thus,

$$P = \sum_{t=1}^{n} \frac{Rt}{(1+K)t}$$

Where,

P = Market share price
Rt = Expected return during a time period.
K = Discount rate

3. Graham & Dodd's model:

According to Graham and Dodd, a considerable importance is given to the dividend quantum by the stock market rather than the retained earnings. Quantitatively, the model is expressed as follows:

$$P = m(D + \frac{E}{3})$$

Where,

P = market share price
D = Dividend per share
E = Earnings per share
m = a multiplier,

It can be observed in the above model that the weight attached to dividends is equal to

four times the weight attached to retained earnings. This is shown as follows:

$$E = D + R$$

$$P = m(D + \frac{D+R}{3})$$

$$= m\,\frac{4D}{3} + \frac{mR}{3}$$

However, the model is based more on subjective judgment rather than objective empirical analysis.

There are two dimensions to the flaws in this model. One is when the earnings of a company are down for a temporary phase, there can .be two possible impacts:

- As the firms usually maintain or at the most slightly reduce the dividend payout ratio, the payout remains high
- The Price-earnings ratio remains high as a temporary reduction in earnings doesn't have a significant effect on market price of the share.

These two effects may lead an analyst to think that a high Price-Earnings ratio is because of a high Dividend payout ratio, which is not the case

Second dimension to the flaws in the model is in case of a firm whose operations are highly risky. In such a case, the dividend payout is low as the management is induced to be conservative. Moreover, highly risky operations result in a law Price-Earnings ratio due to the risk adverse nature of the investors. One may be induced to believe that, a law payout ratio is the result of a law Price-Earnings ratio, which is not justified.

4. **Walter's Model:**

According to J.E. Walter, the market value of a firm's share depends considerably on its dividend policy. The main assumptions underlying his model are

(a) Retained earnings are the only source of finance for the firm.
(b) There is a constant return on the investment.
(c) There is a constant cost of capital.
(d) The firm has an infinite life,

The model put forward by Walter is mathematically expressed as follows:

$$P = \frac{D + (E - D)\frac{r}{k}}{k}$$

Where,

P = Price of shares in the market

D = Dividend per share
E = Earnings per share
(E-D) = Retained earnings per share
r = Internal rate of return on investments
k = Cost of Capital.

The equation of the model can be broken down into its components to represent the stream of dividends and the stream of retained earnings, as follows:

$$P = \frac{D}{k} + \frac{(E-D)\frac{r}{k}}{k}$$

The first component is the present value of an infinite stream of dividends and the second Component is the present Value of an infinite stream of returns from retained earnings.

The major implications of this model are indicated below:

(i) The price per share increases with a decrease in dividend payout ratio, when the rate of return (r) is greater than the cost of capital (k).

(ii) The price per share does not vary with the changes in dividend payout ratio when the rate of return is equal to the cost of capital.

(iii) The price per share increases with an increase in dividend payout ratio when the rate of return (r) is less than the cost of capital (k).

The assumptions on which this model is built render it to very limited use in real situations. However, it does point out towards the importance of dividend payout on the share price.

5. **Gordon's model:**

Myron Gordon used the dividend capitalization approach (Dividend Discount Model) to formulate a model of stock valuation. The assumptions on which this model is based are as follows:

(a) The only source of finance for the firm is the retained earnings.

(b) The firm has a constant rate of return.

(c) It follows from above that the growth rate of the firm is the product of its retention ratio and its rate of return.

(d) There is a constant cost of capital for the firm which remains greater than the rate of growth.

(e) The firm has an infinite life and operates in a tax-free environment,

The valuation formula proposed by Gordon can be expressed as follows:

$$P = \frac{E\ (1-b)}{k - br}$$

Where,

E = Earnings per share

(1-b) = Dividend payment.

b = Ploughed back profits.

r = required rate of return

r = Rate of return earned by the firm on its investments

br = Rate of growth in earnings and dividends.

The implications of this model are quite Similar to those of Walter's model and do not require a separate discussion.

6. **Modigliani and Miller's model (MM model):** Miller and Modigliani maintain that splitting the earnings of a firm into retained earnings or dividends is matter of detail and does not matter as far as the prices of shares are concerned. This opinion is popularly known as the "dividend irrelevance" theorem.

   The model is based on the following assumptions:

(a) Existence of perfect capital markets.

(b) Rational investors.

(c) No transaction costs and free access to information

(d) No floatation costs

(e) No taxes are there.

(f) The investment policy of the firm does not change.

(g) Future prices can be forecasted with certainty. Later, this assumption was dropped.

The model propounded by Miller and Modigliani is as follows:

$$nP0 = \frac{(n + Dn)P1 - I + E}{(1 + ke)}$$

n = Number of shares outstanding at the beginning of the period.

Po = Prevailing market price of the share.

Dn = The change in the number of shares outstanding during the period.

P1 = Market price of a share at the end of period one.

I = The total requirement of capital budget.

E = Earnings of the firm during the period.

Ke = Cost of equity capital.

However, the validity of this model is open to question on two accounts viz,

(i) Imperfection of capital market which is characterized by the presence of taxation, flotation costs, transaction and inconvenience costs, institutional restrictions

(ii) Uncertainty, which can be illustrated by the preference of an investor for current income, the informational content of dividends and the sale of stock at uncertain price,

2.4.2 Techniques to analyze financial statements

The basic financial statements include Balance Sheet and Income Statement or Profit and Loss Account. The balance sheet is a statement that gives the financial position (assets and liabilities) of an organisation on a particular date, generally the last date of the financial year. Income statement shows the revenue earned, cost incurred and the resulting profit or loss for the whole year. Some abbreviations regarding earnings at different stages are given below:

Earnings Before Interest and Tax (EBIT)
Less: Interest
Earnings Before Tax (EBT)
Less: Tax
Earnings After Tax (EAT)
Earnings Per Share (EPS) = EAT/No. of outstanding shares
Dividend Per Share (DPS) = Dividend paid/No. of outstanding shares

Given below are some steps to reach at the important element of fundamental analysis – Intrinsic value of the share.

- Return on Asset (R) = EBIT/Assets
- Effective Interest Rate (I) = Interest expenses/Total liabilities
- Rate of Return on Equity = $R + (R - I)\, L/E$, Where, L/E stands for capital structure
- $EBT = \left[R + (R - I)\frac{L}{E}\right] E$
- $EAT = (1 - T)\left[R + (R - I)\frac{L}{E}\right] E$
- EPS = EAT/ No. of shares outstanding

  The figure of EPS thus reached can be multiplied by the projected P/E ratio to get a projected EPS, which can be used as a proxy for the intrinsic value of the share.

2.4.2.1 Ratio Analysis

To analyze financial statements several techniques are used like Trend analysis, common size statements, cash flow statements, but the most commonly used technique is ratio analysis which will be discussed here. Ratios can be categorized into

- Liquidity ratios, help to understand as to how much current assets do we have to pay out our current liabilities.
- Profitability ratios, give us an idea of the profitability position of a company as compared to its investment, sales or shareholding.
- Solvency/leverage ratios, measure the capability of the organisation to meet its long-term obligations. They basically deal with the capital structure of the company.
- Activity/efficiency ratios show the operating efficiency of the processes in the company. The express a relationship between sales and different assets, showing the speed at which these assets are converted into sales.

Some of these ratios are discussed below.

1. **Liquidity ratios**
   - Current ratio = Current assets/Current liabilities
   - $Quick\ ratio\ or\ acid\ test\ ratio\ = \frac{Current\ assts - inventory - prepaid\ expenses}{Current\ Liabilities}$

2. **Profitability ratios**
   - Net Profit ratio = EAT/Net sales
   - $Operating\ ratio = \frac{COGS + Operating\ expenses}{Sales}$
   - Return on equity = EAT/Shareholders' equity
   - Earnings yield = EPS/MPS
   - Dividend payout ratio = DPS/EPS
   - P/E ratio = MPS/EPS
   - Return on Investment (ROI) = EAT/Total assets (measures the overall profitability of the company)

3. **Solvency/leverage ratios**
   - Debt-equity ratio = Long-term debt/Shareholders' equity
   - Debt to assets ratio = Total debt/Total assets
   - Proprietary ratio = Shareholders' equity/Total assets
   - Interest coverage ratio = EBIT/Interest

4. **Activity/efficiency ratios**
   - Current assets turnover ratio = Sales/Current assts
   - Fixed assts turnover ratio = Sales/Fixed assets
   - Total assets turnover ratio = Sales/Total assets
   - Inventory turnover ratio = Sales/Average Inventory
   - Debtors' turnover ratio = Sales/Average debtors

CHECK YOUR PROGRESS:

XI. Ratio analysis is least used for financial statement analysis True/False

XII. **The Price-to-Earnings (P/E) ratio is used to measure:**

A) Company's profitability
B) Stock market volatility
C) Valuation relative to earnings
D) Cash reserve

XIII **A higher debt-to-equity ratio generally indicates:**

A) Lower financial risk

B) Higher financial leverage
C) Lower profitability
D) Higher liquidity

XIV **The Dividend Discount Model (DDM) values a stock based on:**
A) Past earnings only
B) Expected future dividends
C) Book value of assets
D) Cash reserves

XV **Earnings per share (EPS) is calculated as:**
A) Net income ÷ Total liabilities
B) Net income ÷ Total assets
C) Net income ÷ Outstanding shares
D) Revenue ÷ Number of employees

2.5 LET US SUM UP

In the previous unit, we understood the basics of various tiers of fundamental analysis – Economic – Industry – company analysis and what factors that affect the choice of an economy, an industry and a company. This unit focuses on understanding various techniques that are used in the economic, industry and company analysis. Techniques that are used in economic analysis include some subjective methods like surveys and some mathematical and objective methods like, barometric technique, regression, econometric analysis and opportunistic model building. No one techniques should be solely relied upon, rather the results of one technique should be complemented by other techniques. Under the section of techniques for industry analysis, various techniques like input-output analysis, end use analysis, competitive forces model, PEST technique and SWOT analysis were discussed. Again, the results of one technique must be complemented by other techniques. Company analysis tries to reach at the intrinsic value of a share and the techniques and formulae for doing so have been discussed in this section. Further ratio analysis as a prominent method in analysing the financial statements of a company has been conversed in brief. These techniques help in the achieving objective of company analysis that is to gauge the financial health of a company under consideration and to make future projections regarding its sales and earnings.

2.6 KEYWORDS

- Regression analysis: Regression analysis is a statistical method that shows the relationship between a dependent variable and one or more independent variables.
- Econometric model building: Econometric model building involves using statistical and mathematical techniques to create models having multiple equations that describe

and predict economic phenomena.

- End-use analysis: End-use analysis is a method for understanding how goods or services are actually used by consumers.
- Input-output analysis: Input-output analysis is an economic modeling technique that examines the interdependencies between different sectors of an economy, tracing how outputs from one sector become inputs for another.
- EBIT: EBIT stands for Earnings Before Interest and Taxes. It's a measure of a company's operating profit, i.e. earnings before considering the impact of interest on debt and income taxes.
- Liquidity: In finance, liquidity refers to the ease and speed with which an asset can be converted into cash
- Solvency: Solvency refers to a company's or individual's ability to meet their long-term financial obligations.

2.7 ANSWERS FOR CHECK YOUR PROGRESS

Question No.	Answer	Question No.	Answer	Question No.	Answer
I	F	VI	T	XI	F
II	T	VII	T	XII	C
III	B	VIII	C	XIII	B
IV	C	IX	C	XIV	B
V	B	X	B	XV	C

2.8 TERMINAL QUESTIONS

Q1. Discuss various techniques to perform economic analysis to forecast economic activity of a nation.

Q2. What techniques can used by an investment analyst to gauge the industry future growth prospects?

Q3. Discuss some important valuation models that relate dividend and market price of share.

Q4. Discuss in detail some important ratios to evaluate liquidity, profitability, solvency and operational activity condition of a company.

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UNIT III – SECURITY ANALYSIS (TECHNICAL)

STRUCTURE:

3.0 OBJECTIVES

After studying this unit, you would be able to:

- Understand the meaning of technical analysis
- Recognize the need for technical analysis
- Identify the fundamental components of technical analysis
- Explore various technical indicators that aid in assessing the market behavior and price movement
- Examine the core principles underlying technical analysis
- Apply technical analysis techniques to real-world situations and support decision making

3.1 INTRODUCTION

The analysis and prediction of security price movements is increasingly important in the dynamic financial markets. In the markets, investors, traders and portfolio managers are all looking for some reliable way to improve their ability to make sound decisions in a difficult and uncertain environment. Among the popular methodologies of market interpretation is technical analysis which, while not well accepted by the academics, entails the study of historical market data, mainly of price and volume, in an attempt to discover trends, patterns and other signals that can be used to forecast future fluctuations in market prices. While fundamental analysis considers economic,

financial, and other qualitative factors of securities before determining their intrinsic value, technical analysis is based on the assumption that the price incorporates all the relevant information. Technicians use price charts and other technical studies to discern what the language of the market is trying to tell them, a language created by price, volume, and time. The domain of technical analysis has developed over many years. Technical analysis dates from the hand-charting done in the late 19th century and has evolved to today's computer programs involving complex algorithms and instantaneous data feeds. It is for its longevity and for having been widely applied across various asset classes that makes it relevant. This is because particularly in the trading of stocks, bonds, commodities, and currencies, technical analysis is useful. With the passage of time, the rise of high-frequency trading, machine-learning, and big-data analytics has transformed the context in which markets operate. But, some of the core assumptions of technical analysis hold true and ultimately the collective knowledge and emotion of market participants is best reflected in price, and the interaction with how people act in the market place is a continual emphasis.

3.2 MEANING OF TECHNICAL ANALYSIS

The term technical analysis represents an entire universe of theory and practice as an attempt to understand how the markets work. The focus of technical analysis is on the historical records of the market, notably price and volume, to determine the probability for future actions. Said differently, technical analysts consider that all information is baked in price shifts, and thus by analyzing them, one can predict future movements or reversals. Instead of using the fundamental data, technical analysis focuses on the historical prices and volumes to predict the future price or movement in the market. The mentality behind it presupposes markets having found patterns or trends, a prediction based on market "psychology", investor "sentiment" and the relationship between "supply and demand".

Unlike fundamental analysis that interprets an issue's value using economic or business data, technical analysis is only concerned with data originating from the market. It is the art and science of forecasting security prices based on the study of past market statistics and price patterns. It has its roots deep in the history. It was developed by Japanese rice traders in the 17th and 18th centuries and was later known as candlestick charting. Charles Dow, in the 1800's, developed the Dow Theory, which was the precursor to what we now know as technical analysis. These rudimentary techniques involved the use of line charts consisting of only closing prices. With time those systems became both more complex chart patterns and technical indicators which not just identified a trend, also predicted a trend reversal. Modern technology has greatly enhanced the effectiveness and accuracy of the technical analysis. The use of more advanced charting software, virtual trading

programs, and sophisticated algorithmic programs have made it possible to more closely analyse the market data. The technologies have changed, but the core idea is the same, the idea that the price in the market reflects all known information and that the patterns and history will repeat itself. Following are the main components of the technical analysis:

- **Price Charts:** The most essential technical analysis tool is the price chart. System of applying technical analysis is dependent on presenting price action over time, whether in a basic line chart, more elaborate bar chart, or complex candlestick chart. There are positives and negatives to each type of chart but the goal of all is to give visual representation to price movement historically.
- **Technical Indicators and Oscillators**: These are the tools used to help in price and momentum analysis. This might include, for example, Moving Averages, RSI, MACD (Moving Average Convergence Divergence), Bollinger Bands, etc. These are formulated using mathematical calculations of past price data in an attempt to help us spot trends, gaining momentum or losing momentum, identify where we are in terms of volatility and identify potential areas of prices to reverse.
- **Patterns and Formations**: These are the building blocks of technical analysis and include head and shoulders, double tops and bottoms, triangles, and flags, among others . This is the concept on which these patterns repeat; the psychology of the investor. This is essentially due to the fact that history repeats itself under similar market circumstances also the price patterns repeat.

Technical analysis is based on several basic assumptions. It assumes that market discounts everything. This is probably the most important of the all the principles of technical analysis. The concept is that whatever information is available, either from fundamentals, economics, or sentiment, is already priced in the market. This is because price incorporates all the other market influencing variables. It further assumes that price movement in the market always follows a trend. These trends can be up, down, or flat. Early detection of such trends can be beneficial for traders to position themselves according. Trends can be of the short term, intermediary or long-term type but once a trend has developed it is likely to continue until some major market sentiment change takes place. History always repeats itself is also one of the important assumptions of this kind of analysis. This belief in patterns and trends is the ideological foundation behind technical analysis. Predictive patterns can emerge in sorting through past price action due to this tendency of market players doing similar things in similar contexts over specific repeating market environments. What it does do is produce patterns in the charts that do repeat and thus are the foundation for much of the technical indicators and analysis that is used today. It further assumes that markets are influenced by psychological, news and reactionary facets as well as others. Technical analysis itself is not concerned with, nor measures, these factors but

translates their totality into a view on the price movements. It is, thus, a science of numbers, but also a science of humans.

Technical analysis has sometimes been considered both an art and a science. It is scientific in its charting, in the mathematical indicators, and the analysis of the statisticians. The latter is the art of interpreting charts – knowing when a pattern indicates a reversal of a current trend versus a continuation, knowing unscientific subtleties in market sentiment. Because of the nature of what they do, senior technical analysts have intuition and judgment and become better over time, including by studying. To summarize, technical analysis is defined as multi-faceted in scope, but essentially it is the use of historical prices and volume to predict future market behavior. It is based on assumptions regarding market efficiency, investor's psyche and cyclical behavior of prices. Whether one views it as a hard science or a type of artistic interpretation, technical analysis is essential for anyone wishing to understand and operate within the world of finance.

CHECK YOUR PROGRESS

I. Technical analysis is primarily concerned with studying:
   a) Corporate earnings and balance sheets
   b) Macroeconomic indicators
   c) Historical price and volume data
   d) Management quality

II. Which of the following is not a basic assumption of technical analysis?
   a) Market discounts everything
   b) Prices move in trends
   c) History always repeats itself
   d) Intrinsic value can be measured by fundamental ratios

III. The principle that "volume must confirm price" implies:
   a) High volume on a breakout strengthens the signal
   b) Price moves always precede volume moves
   c) Volume is irrelevant in technical analysis
   d) Low volume is ideal for trend strength

IV. Support in technical analysis refers to:
   a) level where selling pressure outweighs buying
   b) A price floor where buying interest may re-emerge
   c) A type of chart pattern
   d) A mathematical oscillator

V. A breakout above resistance with weak volume is likely to be:
   a) A reliable bullish signal
   b) A false breakout

c) A signal to sell short
d) Unrelated to volume

VI. Divergence occurs when:
a) Price and an indicator move in the same direction
b) Price makes a new high but RSI does not
c) Volume equals price change
d) Candlestick bodies overlap

VII. The "market discounts everything" principle suggests:
a) Only fundamental data matter
b) All known information is already reflected in price
c) Price ignores investor sentiment
d) Charts are less reliable than news

3.3 NEED OF TECHNICAL ANALYSIS

Technical analysis plays a crucial role by helping traders identify market trends and recurring price patterns through historical data. It enables informed decision-making, optimal entry and exit timing, and efficient risk management in the dynamic trading environment. Following points shreds some light on to why is technical analysis needed for the traders:

1.3.1 Navigating market uncertainty: Market behavior is obviously high in uncertainty, and this is the first problem of trading and investment. Markets are subject to a plethora of variables such as macro-economic considerations, geopolitics, or retail investor sentiment. As complex as the price history is, it does represent physical evidence of how the market has responded through various conditions. Technical analysis offers a way to make sense of these reactions, and to allow trading decisions to be made even in these kinds of environments. In practice, the technical analysis helps investors to spot areas or prices where the market may reverse or the market may accelerate, with the reasons behind this move not necessarily visible at the time. Technical indicators and chart patterns are some of the methods employed to determine market over-extension when extreme volatility is present, at which point traders will adjust their positions based on such information.

1.3.2 Complementary approach to fundamental analysis: Whereas the focus of fundamental analysis is intrinsic value and the operation of the corporation, technical analysis, as a "timing" tool, deals with the study of price behavior. This is not to say that fundamentals have no value in realizing that a security is undervalued or overvalued, but timing your investment is key. Technical analysis answers the

"when" question and is useful for identifying the best times to enter and exit positions in the market. In addition, technical analysis has its virtues in markets or asset classes where they are less reliable or harder to explain data from a fundamental perspective, such as for commodities, currencies, or notoriously liquid exchange traded funds (ETFs). In such instances, historical prices patterns and analyses of the past and latter-day trends can be of help where fundamentals may be dynamic or uninformative.

1.3.3 Enhancing trading strategies: The best trading plan is one that can accommodate different market environments. Technical analysis is the means to formulate, test, and refine these strategies. By analyzing historical prices, traders can see how well these technical indicators and chart patterns have performed, by back-testing trading systems that incorporate them. It is a confidence building process as much as it is a process to establish the desired risk to reward and stop loss levels. For instance, combining moving average crossovers with RSI (Relative Strength Index) for trade entry and exit creates a system for a trader. The repetitive nature of market cycles that technical analysis reveals tends to lead one to developing solid, data-based strategies that are important keys to controlling emotional trading and increasing consistency of decision-making.

1.3.4 Risk management and capital preservation: Proper risk management is one of the golden rules of trading. They provide projections of major, minor and intermediate support and resistance levels that are, in many cases, psychological as well as actual price points where the stock price can encounter support or resistance, or experienced a breakout. Using historical price, traders can put in stop-loss orders and position sizing that will limit potential unfavourable movements. Others can be told when it is appropriate to tighten stops or cut exposure, for protection of capital on the bad days by using chart patterns to provide signals of breakouts or reversals. For example, technical analysts use oscillators and volatility measures, such as the Average True Range (ATR) or Bollinger Bands, as a measure of market uncertainty. These are used primarily to measure risk so as to reallocate the portfolio accordingly. Risk-minimizing policies such as these are necessary for operation in dynamic and capricious market-places if one is to preserve capital.

1.3.5 Psychological and behavioral dimensions: One of the things that goes unnoticed, is that technical analysis represents the psychology of the market. Investors and traders are people and people as a group often behave in ways that are evident in chart patterns. Yet the impact of fear, greed, excitement and uncertainty in the price action leaves signatures that can be studied. Technical analysis can help market participants to gain a sense of this behavioral component that pure

fundamental analysis might miss. This includes specific chart patterns, such as the "head and shoulders" or "double bottom," which indicate repeated investor sentiment. Realizing this can give you advance signs to possible shifts in market sentiment. Technical analysis therefore not only provides a means to forecast price movements; it also provides insights into the collective psyche of market participants.

1.3.6 Timeliness and accessibility of data: Today's financial markets are awash with data, which can often be utilized on a high frequency real-time basis. Technical analysis operates well in this environment. This has allowed individual traders, armed with expensive charting software and live data feeds, to spot minute-by-minute price action that they can take advantage of over minutes or hours. This is useful when space is time and in high-frequency environment that is crucial. Historical market data is easily available and thus technical analysis is possible for almost any market and any time frame. The principles of technical analysis are the same for an analyst analyzing a month chart trend that is a decade old, or minute by minute fluctuations. This flexibility highlights something vitally important in our understanding of the trading of contemporary securities more technical analysis.

1.3.7 Adaptability in an evolving market landscape: Regulation, technology, global dynamics constantly change the landscape of markets. Technical analysis proved to be remarkably well-suited to these transformations. Along with the use of more sophisticated charts and specialized software, technical analysis becomes updated by new indicators and increasingly detailed patterns, as well as by the use of machine learning. This form of adaptability allows for technical analysis to remain applicable to the changing financial markets. To wrap up, the reasons that also support the technicals needs are the following: to master uncertainty, to use it in conjunction with fundamentals, to develop trading strategies, to manage risk, to grasp the psychology of the market, and to adapt to the contemporary high-speed market. With these and other benefits, technical analysis remains a useful technology for speculators and investors, allowing individuals to make sense of the morass of price movement in a methodical way.

3.4 PRINCIPLES OF TECHNICAL ANALYSIS

Technical analysis is based on specific principles to help make sense of and interpret market data. These axioms, in addition to theoretical concepts, are practical guides for tomorrow's security trading decisions. Following are the several major tenets of technical analysis:

3.4.1 Market discounts everything: One of the most important principles of the technical analysis is "the market discounts everything". It means that mean that all

knowledge is already discounted in prices. Macro data, earnings, political developments, investor psychology, you name it, it is all reflected in market prices. This means that it is unnecessary to look beyond the price chart in order to assess the market. Traders use price charts and technical indicators because they think that everything that is known, expected, and uncertain about the market is reflected in it. The reaction is seen in the price movement, for example when there is a major political event. Instead of attempting to understand all these intricate factors separately, the technical analyst looks at the price action that they create. It is this principle that levels the playing field and makes complex variables reducible to data that can be acted upon.

3.4.2 Principle of trend recognition: Another principle of technical analysis is that prices move in trends. These trends can take the form of long-term trends in which prices are either increasing or decreasing, with shorter-term fluctuations in price along the way. Identifying trends and having some degree of insight on their presence, direction, and magnitude are all important components of a winning technical trading strategy. A trend is a consistent, directional price movement. Technical analysis recognizes primary trends, secondary, and minor fluctuations; the former is the overall direction of prices, the second short-term corrections in a primary trend, and the last, temporary short-term movement in prices. Instruments for identifying trends include moving averages, trend lines, and channels. For instance, an increasing moving average over a given number of periods indicates an uptrend, a decreasing moving average indicates a downtrend. As the trend is caught early in its development by the trader, he can sidestep in order to ride the movements and maximize the profits. On the contrary, identifying a trend's termination point helps traders to cut losses by leaving the position before the counter-trend.

3.4.3 Principle of support and resistance: Support and resistance levels are those points at which the market tends to stop and reverse itself in technical analysis. Support is the level at which there is enough interest in buying to prevent prices from decreasing further, while resistance is the point at which, where there is selling pressure greater than buying pressure on an advancing price. These levels are identified on historical price charts. A support level that has been tested several times indicates that buyers keep coming back to the market, while a resistance level that has been tried many times indicates strong selling interest. Support and resistance act as critical decision points. A break above resistance is a potential bullish breakout while a failure to break support would be the catalyst for additional losses. These levels are frequently used by traders to place their stop-loss or take-profit points.

3.4.4 Principle of reptation: This principle works on the fundamental that history always repeats itself. Market psychology, according to technical analysts, is also cyclical. Because investors act in like manner to recurring situations, chart patterns and trends will typically repeat themselves over time. It is the basis for the analysis of technical patterns like head and shoulders, double tops and bottoms, triangles, flags. Repetitive patterns offer traders the ability to predict future movements. Technical analysts expend enormous effort in learning these and many other chart formations and indicators that may indicate a trend reversal or an ability for the trend to continue. The patterns often show such predictive power when back-tested on historical data. While not a promise of outcomes the repeated nature of these patterns suggests their utility.

3.4.5 Principle of cyclical and seasonal trends: Numerous securities have cyclical or seasonal tendencies influenced by the larger economic cycle, by seasonality, or by recurring events. Understanding such recursive behavior can be very enlightening, particularly in markets such as commodities or retail stocks. Cyclical trends refer to the patterns such as economic booms and recessions can also be seen on long- term charts. Knowing what stage, the market is currently positioned may help time investments. Seasonal trends, some sectors are more seasonal than others. For instance, retail stocks will often see an advance ahead of the holiday season. Technical analysis is useful in determining when these seasonal moves begin and end.

3.4.6 Principle of volume confirmation: Volume, or the volume of shares or contracts traded during a certain period, is an important measure from the standpoint of technical analysis. A trend with heavy market activity is seen as more secure and predictable than one with light activity. The increase in price on heavy volume is considered indicative of the strength behind the price move. Conversely, a low volume move upward could mean that there is no support and that the breakout is false or the move is only temporary. It is common to use volume in conjunction with other indicators based on a given stock's price, to help hone in on trade signals. This can be seen in that breakouts or reversal of trends are validated only if volume is increasing as well.

3.4.7 Principle of divergence between price and indicators: Divergence is where the movement of prices on a particular security are moving opposite to one or more technical indicators – oscillators such as RSI or MACD. This difference is often a strong signal that the current trend is tired, and possibly going to soon reverse. In the case of price makes a new high and oscillator fails to do so. Perhaps this discrepancy is signalling a top to the upward trend? Thus, divergence can also be a very important

feature of risk management, as it acts as an early warning signal prior to an actual reversal in a trend.

These are not wholly separate principles but, they do not compete, rather they act in synergy. The proper technical analysis methodology will take all of these principles and incorporate them into a methodology. For instance, moving averages may identify a trend and volume analysis may confirm it, the rate of support and resistance might point at potential reversal points along that trend. By combining various types of analysis, traders obtain a multi-dimensional community map of market behavior that provides more reliable predictions and trading signals. Further the role of technology has also affected the way these principles are adopted. High quality charting platforms and the ability to process data at high speeds has allowed for an easier and more accurate application of these principles. Today most technical analysts use computerized systems to track trends, volume momentum, and divergences in real-time, among other things. Algorithms can quickly search large amounts of data and give insights that can be acted on quickly in rapidly shifting markets. These types of tools have now to a large extent democratized the practice of technical analysis, and now individual traders can even begin to implement complex strategies that incorporate these age-old principles.

CHECK YOUR PROGRESS

I. Technical analysis originated with Japanese rice traders. **(True/ False)**
II. Fundamental ratios are the primary focus of technical analysis. **(True/ False)**
III. A high-volume breakout is generally more reliable than one on low volume. **(True/ False)**
IV. Technical analysis assumes history does not repeat itself. **(True/ False)**
V. Seasonal and cyclical trends are irrelevant to traders. **(True/ False)**
VI. Volume confirmation is one of the core principles of technical analysis. **(True/ False)**
VII. Technical analysis cannot be applied to commodities or currencies. **(True/ False)**
VIII. High-frequency trading has decreased the importance of real-time charting. **(True/ False)**

3.5 LET US SUM UP

Technical analysis is a very popular method for predicting trends in security prices because it has historically been able to use past data to give insights that can be effectively acted upon. Through this analysis a few important points emerged. It works on the assumption that the collective knowledge of the market is reflected in the price movement and that historical patterns are likely to recur. It is a method for tracking and interpreting market behavior using price charts, technical indicators and one that allows traders to see the patterns of the market in a deterministic way. The demand for technical analysis across markets exists due to uncertainty regarding market direction, technical analysis' ability to provide another perspective to fundamental analysis, and technical analysis' utilization in managing risk. The fact

that these methods are directly applicable to strategy development, timing of trades and capital preservation is that many traders and investors continue to use these methods across different asset classes. With the increasing quantity of data produced by markets, and more sophisticated and precise analytical tools being developed, principles of technical analysis will likely only become more advanced.

3.6 Keywords

Technical Analysis	Study of past price and volume data to forecast future market movements.
Price Chart	Graphical representation of a security's price over time (line, bar, candlestick).
RSI (Relative Strength Index)	An oscillator measuring speed and change of price movements.
Support	A price level where buying interest tends to prevent further decline.
Resistance	A level where selling pressure may cap further price increases.
Trend Line	A straight line connecting successive highs or lows to show direction.
Divergence	When price moves opposite to a technical indicator, signalling potential reversal.
Volume Confirmation	Using trading volume to validate price moves or breakouts.

3.7 Answers to check your progress

Q. No.	Answer	Q. No.	Answer	Q. No.	Answer
I	**C**	VI	**B**	XI	**False**
II	**D**	VII	**B**	XII	**False**
III	**A**	VIII	**True**	XIII	**True**
IV	**B**	IX	**False**	XIV	**False**
V	**B**	X	**True**	XV	**False**

3.8 Terminal Questions

- Describe the fundamental meaning of technical analysis and discuss its importance in modern security analysis.
- Analyse the reasons why technical analysis is essential for market participants.

- Explain the core principles underlying technical analysis. Evaluate how these principles serve as the foundation for various technical analysis methods and trading strategies, providing practical instances of their application.
- Critically evaluate the use of technical indicators in predicting market trends and price reversals.
- What are the different types of charts? discuss the application of chart patterns in technical analysis also.
- Describe how technical analysis tools and principles are incorporated into various trading strategies.
- Explain the contribution of technical analysis in managing investment risk. Discuss various techniques that help traders mitigate potential risks.
- What challenges do analysts face when relying solely on technical data? Explore scenarios in which technical analysis might fail to predict market movements, and suggest how traders can mitigate these shortcomings.
- Critically assess the evolution and future perspectives of technical analysis. What skills should aspiring professionals develop to remain effective in the evolving market environment?

Suggested Readings

- Desai and Joshi, Investment Management (Security Analysis and Portfolio Management), S. Chand Publications
- Prasanna Chandra, Investment Analysis and Portfolio Management, McGraw Hill
- Bhatt, Security Analysis and Portfolio Management, Biztantra Publications
- Tripathi and Panwar, Taxmann's Investing in Stock markets, Taxmann Publications Pvt. Ltd.
- Donald, Ronald and Ashwini, Security Analysis and Portfolio Management, Pearson Education
- Gurusamy, Financial Markets and Institutions, Vijay Nicole Imprints Pvt Ltd.
- Reilly, Brown and Leeds, Investment Analysis and Portfolio Management with MindTrap, Cengage Learning
- Kevin, Security Analysis and Portfolio management, PHI Learning Pvt. Ltd.
- William, Edwin and Stephon, Modern Portfolio Theory and Investment Analysis, Wiley India
- Tripathi, Taxmann's Security Analysis and Portfolio Management, Taxmann Publications Pvt. Ltd.

CERTIFICATE IN
STOCK MARKET AND TRADING OPERATIONS
GC-CST2: Basics of Security Analysis and Portfolio Management

UNIT IV – THEORIES OF TECHNICAL ANALYSIS

STRUCTURE:

4.0 OBJECTIVES

After studying this unit, you would be able to:

- Understand fundamentals of the core technical analysis theories
- Understand different types of charts and their usefulness
- Identify and analyze market indicators
- Understand the concept and identification of support and resistance levels
- Interpret complex price patterns
- Understand the basic difference between contrast technical analysis and fundamental analysis

4.1 INTRODUCTION

Technical Analysis (TA) is defined as the study of prices in securities by utilizing statistics developed by market activity, i.e. primarily past price and volume. Those who practice technical analysis believe that the current price of a security already reflects all information. For some or many who analyse trends in historical data, they believe that this historical data can be interpreted to forecast the direction of the prices in the future. Technical analysis is often compared against fundamental analysis, which comprises the use of financial statements, competitors, and macroeconomic circumstances to determine the actual value of a firm. Technical

analysts on the other hand trust in visual patterns and other mathematical indicators to give them a feel for where the price is going to move to next. This approach is built on several core assumptions:

- **Prices Move in Trends:** Once a trend is established, prices are believed to continue in that direction until clear indicators suggest otherwise.
- **Market Discounts Everything:** All known factors—economic data, news events, and investor sentiment—are already incorporated in the price.
- **History Tends to Repeat Itself:** The cyclical nature of human behavior means that price patterns and trends tend to recur over time.

All these techniques had their beginning around the turn of the 20th century, perhaps most famously with Charles Dow, whose theories on market movement are still studied and followed by traders today. From elementary hand drawn diagrams, the methods have developed into the computer based statistical tools that are employed by the computerized trading programs of today. Today, technical analysis is used in various markets including the stock and bond markets as well as in the commodities and currency markets. It provides the tools for trading to find high-probability buy and sell points, set effective stop loss points, and also effectively manage risk even in highly volatile markets. If you are a day trader who is hoping to profit off of minute-to-minute price movements or a long-term investor simply wanting to get the macro trend correct, the ability to understand technical analysis is a must when dealing with the financial markets.

4.2 THEORIES OF TECHNICAL ANALYSIS

Technical analysis is a method of attempting to predict the future movement of prices by analyzing past market data. Throughout time, several theories have been established to be the core of this field. The Dow Theory, Elliott Wave Theory, and Random Walk Theory schools of thought, three of the most prevalent, explain in distinct ways, the pattern by which markets progress. These theories are explored in this chapter modeling the historical development, basic premises, and the larger implications for traders and investors.

4.2.1 Dow Theory

The Dow Theory is often considered the first systematic approach to technical analysis. Loosely based on the editorials to the editor of Charles Dow, co-founder of Dow Jones & Company and chief author of the Wall Street Journal, Dow's theory was never actually written by Dow himself. Instead, his views on market behavior have since been modified by his followers and interpreters. It begins with the assumption that "the market discounts everything"; that is, that market prices are

reflect all the information, speculation, and expectations available. It is based on the assumption that market movements are cyclical and can be understood as predictable patterns that depict both the economic realities as well as the psychology of the investors. The Dow Theory is based on the following principles:

A) **Market Trends Exist** - The theory postulates the existence of Market trends called as Primary Trend, Secondary Trend, and Minor Trend. Primary trend is the long-term movement that takes from several months to years. This movement is the one that traces the general tendency of the market. Second, are the smaller scale corrections or counter-trends that occur often and last from a few weeks to several months. Instead, minor trend is a term that describes movements in prices for short period of time and are of secondary character.

B) **Confirmation across Averages -** Dow thought, especially for an actual trend, that industrial and transportation averages must confirm each other. The reasoning would be that if both indicators identify a movement, then the movement is in fact real.

C) **Trends persist until proven otherwise**: A major guideline is that trends continue until there is evidence of the beginning stage of a complete reversal. They are warned to "only be contrarian when you have hard evidence that the trend has changed".

D) **Volume as a Secondary Confirmatory Factor**: While price is primary, volume plays an important role in validating trends. Rising volume during a trend provides additional confirmation that the movement is supported by substantial market participation.

For technical analysts, the Dow Theory provides a structured approach to determining market direction and timing entry or exit points. By focusing on the persistence of trends and the importance of cross-index confirmations, traders can make strategic decisions without being swayed by short-term volatility. This framework has served as the grounding principle for many modern technical tools and continues to influence contemporary trading strategies.

4.2.2 Elliott Wave Theory

Developed by Ralph Nelson Elliott in the 1930s, the Elliott Wave Theory introduced a revolutionary idea that market prices follow repetitive wave patterns that are the direct result of investor psychology. Elliott was fascinated by the self-similar nature of price movements, believing that market fluctuations reflect the collective sentiment of investors as they react to both external events and internal expectations.

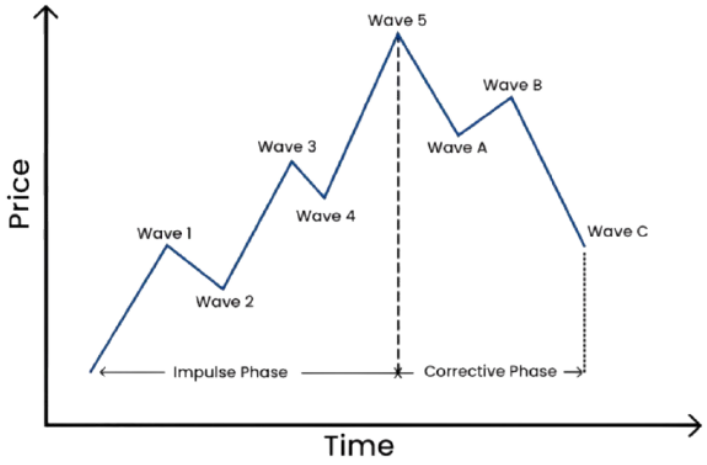

Figure-1

Elliott's hypothesis is rooted in the idea that human behavior—in particular, the psychology of optimism and pessimism—tends to repeat itself in regular, predictable patterns. He observed that these waves could be decomposed into a series of impulses and corrections, reflecting the natural ebb and flow of market sentiment. According to Elliott, markets move in a five-wave pattern when trending in the direction of the larger trend called impulsive phase, followed by a three-wave corrective phase. These waves can be understood from the Figure – 1 as shown above.

Impulsive Phase (5 waves):

- **Wave 1**: Represents the initial movement in the direction of the trend.
- **Wave 2**: A corrective move that does not reverse the trend.
- **Wave 3**: Often the longest and most powerful wave, driven by widespread market participation.
- **Wave 4**: Another corrective phase that retraces a smaller portion of Wave 3.
- **Wave 5**: Final impulsive wave signifying the tail-end of the trend before a full correction.

Corrective Phase (3 waves):

- **Wave A**: Initial move against the dominant trend.
- **Wave B**: A brief rally typically seen as a counter-trend.
- **Wave C**: A more pronounced move that reaffirms the dominance of the corrective phase.

The Elliott Wave Theory is often celebrated for its ability to explain the seemingly erratic behavior of financial markets through a lens of organized patterns. By mapping out the wave structure, traders can estimate the potential duration and magnitude of future price moves. However, critics argue that the theory is subjective and prone to different interpretations. Identifying the beginning and end of waves accurately is more of an art than a science, which makes the theory less definitive in fast-moving markets.

4.2.3 Random Walk Theory

While the Dow and Elliott theories are all based on structured, cyclic behaviours, the Random Walk Theory states that "price movements are largely random" and therefore "stock prices follow a random walk". Economists like Paul Samuelson and Burton Malkiel are among those who have promoted this idea, which states that price movements are random and completely independent, and thus that one cannot use past data as an easy guide to future movements. In the 1960s, the Random Walk Theory became inextricably linked to the efficient market hypotheses. It is a direct assault on the belief that local markets can be analyzed by looking for patterns in previous prices, and asserts that no such patterns exist; that such 'patterns' are nothing more than random occurrences rather than manifestations of economic realities. The Random Walk is essentially a statistical idea. This can be phrased mathematically in terms of two simple recursive formulas. An illustrative one would be:

$P_t = P_{t-1} + \epsilon t$

Where:

- P_t is the price at time (t).
- P_{t-1} is the price at the previous time interval.
- ϵt is a random error term, typically assumed to follow a normal distribution with mean zero.

This equation encapsulates the idea that current price changes (ϵt) are random and thus, unpredictable. New information that the market did not see coming generates forward pricing, not historical prices. The Random Walk Theory had a major influence in the finance field especially towards the development of the market efficiency idea. If prices are really random, it is obvious that any approach based on chart patterns, waves analysis, or any other kind of historical data to predict what future movement should be expected, is at this origin heavily bound. The idea is that active trading using technical analysis will not produce above-average profits on a consistent basis in extended time periods. The Random Walk Theory is therefore a warning and a caveat for technical analysts. It provides a good reminder to analysts of both the existence of patterns and trends in the markets, and the fact that these can be overridden by a capricious element in markets that defies even the most sound of these theories. It is from this that hybrid models integrating both deterministic patterns and stochastic work have emerged in the design of trading strategies. Ironically, some of the interest developments in data science and statistical processes have served to confirm parts of the Random Walk Theory. In this realm of financial market modeling, the process of running the systems such as Monte Carlo simulations to predict hypothetical future paths for asset prices, is dependent on the initial random set of data provided. This is not to say that these statistical tools have made technical

analysis redundant since, while effective, there are also limits to their accuracy.

4.3 CHARTING TECHNIQUES IN TECHNICAL ANALYSIS

Technical analysis can be described as the "science" of determining future price behavior based on the interpretation of historical price behavior, via the use of visual tools and methods, known as charting. They act as the telescope that allows traders to focus uncountable amounts of price data into clean pictures that are easy to view in order to observe the patterns, trends, support and resistance as well as possible reversal signals. In the following, we trace the development of charts, clarify different types of charts and the strengths and weaknesses of each, and look at how traders actually use charts in making decisions. These analyses stem from the idea that, by examining the way prices have moved in the past, through charting techniques, there are indications of what the market will do in the future. Charting methods are not just data plot points; they are a narrative of the psychology of the market, the mood of investing participants, and the never-ending battle opposing forces of supply and demand. While fundamental analysis concerns itself with company performance and macroeconomic analysis, charting is a study of market behavior, presented in a visual "story". This bugs many narratives are built off kinds of charts which not only show the price at a certain point, but movement and movement of movement. Charting has an important capacity to interpret data from raw facts to understandable trends. One of the most important aspects of charting is that it allows users to disregard day-to-day wiggles in the market and trade based on overall trends, and possible trend changes. This gives merchants the ability to trade with the degree of confidence that allows them to both enter and exit or hold positions on the basis of real, as opposed to speculative, data. There are many types of charts used in technical analysis. They show differently the information about the price and they are intended to help a different analysis.

4.3.1 Line Charts

A line chart is the most basic form of a chart: prices (usually closing prices) are plotted in sequence along a line. The simplicity of the line chart is its best attribute. It is designed to present price trends over time with high resolution and minimal clutter, thus it is particularly suited for long term trend analysis. Line charts are most helpful for a bird's-eye view – the sort of information investors who are only interested in long-term movements are interested in, an idea of which way the broader markets are going without the distractions of intraday "noise".

4.3.2 Bar Charts

Bar charts designate even more information in addition to that charted in line charts by indicating the open, high, low, and close (OHLC) for each trading period. This "bar" has a simple closing price at one end of the bar but also encompasses the entire

price range within that period at the other end, this helps give the analyst a bit more information about the context of the close. It includes a high price, low price, open price and close price in each bar of a graph. It provides a richer detail on intraday volatility and price dispersion. This is also something that can be used by short-term traders, but also by long-term analytical strategists who want a deeper insight of movements in the market. The strength of a bar series is that it is easier to make particular, close comparisons across time because the zero line is visible. They provide the trader with better assessment of changes in the momentum and potential breaking out or breaking down trades.

4.3.3 Candlestick Charts

One of the most widely used charting methods today is the candlestick chart, which combines some of the characteristics of bar charts with color-coded bodies to create a truly dynamic visual representation. These charts, which began in Japan, are known as “candle” charts, as the “candle” for the day’s price action is filled if the day was down and hollow if the day was up. Each candlestick looks different in colour and shape, and this aids in identifying market sentiment at first sight. Doji, Hammer, Engulfing, and Shooting Star are some of the infamous patterns that candlestick charts show and can signal a reversal or continuation of the market. Candlestick charts, which can generally convey market sentiment and which most technical analysts favour, have been used to display this analysis. Since these charts provide the instant gratification of visualization, customers can often trust the patterns they see and feel emboldened to use them accordingly as useful signals for short-term trading tactics.

4.3.3 Point and Figure (P&F) Charts

Unlike most charting methods that incorporate time in some way, Point and Figure (P&F) charts look exclusively at movements in price that are deemed to be of importance and completely disregard the passage of time. It is a great method to eliminate market noise and centre on raw price action. Point & Figure (P&F) charts signal, by means of “X’s” and “O’s”, rising and declining prices. Because they have no time component, they eliminate meaningless gyrations and focus on significant price movements. Very efficient to detect a trend or a turning point, since the Chart only reacts if the price has exceeded a pre-set level itself.

Apart from these charts, Renko Charts, Heikin-Ashi Charts, Kagi Charts, Three-Line Break Charts etc., are also used under different conditions. Charting is not only visual but a decision-making tool. These are useful in identifying trends, pattern recognition, volatility analysis, noise filtering, support & resistance mapping, entry & exit signals, risk management etc.

CHECK YOUR PROGRESS

I. Which core assumption of technical analysis states that all known information is already reflected in price?
   a) Prices move in trends
   b) History tends to repeat itself
   c) Market discounts everything
   d) Volume is irrelevant

II. According to Dow Theory, which two averages must confirm each other for a trend to be valid?
   a) Industrial and commodity averages
   b) Transportation and utility averages
   c) Industrial and transportation averages
   d) Utility and service averages

III. In Elliott Wave Theory, how many waves make up the impulsive phase?
   a) Three
   b) Five
   c) Seven
   d) Eight

IV. The Random Walk Theory implies that:
   a) Price patterns reliably predict future moves
   b) Prices follow a predictable cycle
   c) Price changes are random and independent
   d) Trends always persist

V. Which chart type filters out time and only records significant price moves?
   a) Candlestick chart
   b) Renko chart
   c) Point & Figure chart
   d) Line chart

4.4. MARKET INDICATORS

Market indicators are those tools that convert historical price and volume into useful information. They provide indication of momentum, possibly an indication of a trend and the trader should time their entry or exit accordingly. These indicators can be further broken down into three types:

4.4.1 Trend Indicators

Simple Moving Average (SMA): Takes the average of closing prices for a specified number of periods and eliminates short- term fluctuations.

Exponential Moving Average (EMA): Gives more importance to recent prices, and is thus more "sensitive" than SMA.

4.4.2 Momentum Indicators

Relative Strength Index or RSI: Fluctuates between 0 and 100. It Alerts of overbought (usually above 70) or oversold (usually below 30) levels.

Stochastic Oscillator: Compares the closing price relative to the price range over a determined time frame. It is able to identify potential reversal points based on the degree of outside the historical range the price is.

4.4.3 Volatility Indicators

Bollinger Bands: These are bands that are plotted two standard deviations away from a middle band which is normally a 20- period SMA. They expand as volatility grows and they contract as volatility shrinks.

Average True Range (ATR): An indicator used to determine market volatility by accounting for the true range, which factors in gaps. The higher the ATR the more volatility and vice versa.

4.4.4 Volume Indicators

On-Balance Volume (OBV): This measures a security's positive and negative volume flows to price movement to determine what the probability of trading will be. An increasing OBV reading during an uptrend is considered evidence of significant buying interest.

Volume Rate of Change (VROC): It indicates the velocity at which volume is ascending or descending. It can also be an indication of the strength of a price movement.

4.4.5 Multi-purpose Indicators

MACD (Moving Average Convergence Divergence): This indicator is comprised of two EMAs. It indicates a momentum shift through the convergent/ divergent pattern of the MACD and signal lines.

Parabolic SAR (Stop and Reverse): This indicator is shown as dots, either above or below the price. It also helps to identify when to set stops and tracks the market for possible reversals.

By integrating these indicators, traders generate a more nuanced understanding of market conditions. No single indicator is foolproof; often, insights are derived from examining multiple indicators simultaneously. The combined methodology helps weed out false signals, corroborate trends, and solidify entry and exit strategies.

4.5 SUPPORT AND RESISTANCE LEVELS

Within technical analysis, support and resistance represent key building blocks for helping traders establish price levels at which the market is likely to reverse or stall. These are important for trade decision of entering, exiting and setting stop losses in a trade. By knowing how support and resistance function, investors can better analyse the market action, predict price movements, and trade prudently.

Support is a concept in technical analysis that describes a price level on a chart where a declining stock price has failed to penetrate or has rebounded from. This occurs because there is already a level at which most traders and investors think that asset is a way too cheap or too expensive and thus, they will buy it. The psychological reason is that when the price of an asset declines and it approaches that support level, more buyers will want to jump on board because it's cheap. The purchase creates buying pressure, and decreases selling pressure, and thus the price is less likely to be pushed down further. This thus functions as a "support line" for prices, in that they will not easily be able to fall beneath this level. Such behavior is not merely academic; it is in fact easily identifiable in the historical price data of actually existing markets when a stock rebounds multiple instances against the same price level. If the prevailing price breaks below the support level, then the market is sending a message that the buyers supporting the price at that level weren't strong enough to keep the market up. It can then be said that a previous support becomes a new resistance. It indicates that, if the price will attempt to retest up this level, here it may have a hard fight to surpass it, since the sellers, who bought here before, might be interested in closing their positions.

On the other hand, Resistance refers to the point at which a stock will stop rising. This is because most investors and traders at that level think the asset has gotten overvalued, or too expensive, and thus they are more likely to sell. The resistance level is the price at which the asset price tends to go down as it is believed to be overvalued, and as the asset price approaches this price level supply increases due to the impending likelihood of a lower price level, and the asset will be overbought. Hordes of sellers will enter the market ready to take profits or avoid potential losses. Selling pressure is stronger than buying interest which dampens the price movement to the upside. So, it can be thought of as a 'ceiling' for the price; preventing the security from moving much higher in the short term. Resistance is where the security has in the past found it difficult to exceed and is often depicted as a horizontal line on a chart. If the price does eventually break above the resistance level, this is often a positive sign that the market has taken a turn for the positive; in other words, the buyers finally increased their buy orders to the price in which they are now able to overcome the selling pressure at that point. Once it is broken the level of resistance can reverse roles and become a level of support. It is because traders that didn't participate in the first move may want to buy on a move back down to that old level and thus provide support to that level causing it to be a new "floor".

Role reversal (support becoming resistance, or vice versa) is a popular technical trading concept that assists traders with projecting possible future movement. Support and resistance play critical roles in technical analysis for several reasons:

- **Predict Potential Reversals:** They signal possible reversal points in price trends.

- **Plan Entry and Exit Points:** Traders often buy at support and sell at resistance.
- **Set Stop-loss Orders:** Helps in placing stop-loss orders to minimize losses if the price moves against the trade.
- **Determine Breakout Opportunities:** When prices break through support or resistance levels, they often result in significant price movements, signalling trading opportunities.

In general, the methods to identify the support and resistance levels would differentiate among traders and investors could be historical price behavior, volume analysis, moving averages, pivot points, candlestick patterns, etc. Each of these requires some measure of caution, particularly using past data to find support and resistance levels, as an over reliance on historical data could be inappropriate when market conditions are too unstable and undergo a drastic change. Volume confirms could similarly be ignored, and decision in the analysis will be misleading as well.

4.6 INTERPRETATION OF PRICE PATTERNS

Understanding the price patterns is the most important part of the technical analysis. These patterns are distinct formations that emerge on price charts, reflecting the collective psychology of market participants. The patterns also reveal a narrative about an investor response to any news, earning reports, economic data, etc., establishes whether or not the current trend will be continuing or will be reversing. As humans consistently react in the same way to fear, greed and uncertainty in the market, patterns of behavior are seen in pricing that are psychologically based. This way anyone can determine when to take a position towards a trend or away from it. It will increase a person's probabilities of success on a day- trading level or an investing level. Continuation patterns and reversal patterns are the two primary types of patterns.

4.6.1 Continuation Patterns

These patterns indicate that the existing trend—whether upward or downward—is likely to continue after a brief pause or consolidation. Common continuation patterns include:

- **Triangles (Ascending, Descending, Symmetrical)**: Prices consolidate in a narrowing range before breaking out in the direction of the prior trend (Figure – 2).

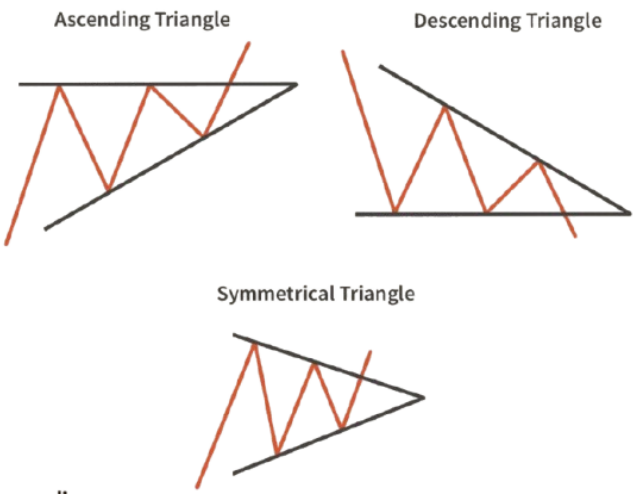

Figure – 2

- **Flags and Pennants**: Small, short-term patterns that represent brief pauses after strong price moves. Flags look like rectangles; pennants resemble small triangles (Figure – 3).

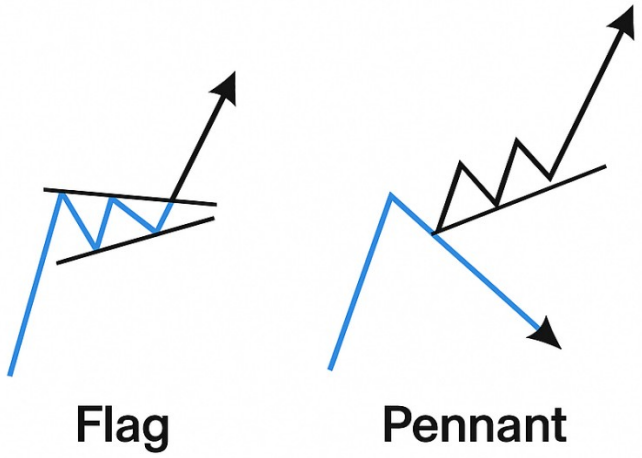

Figure – 3

- **Rectangles**: Prices move between horizontal support and resistance levels before breaking out in the same direction as the initial move (Figure – 4).

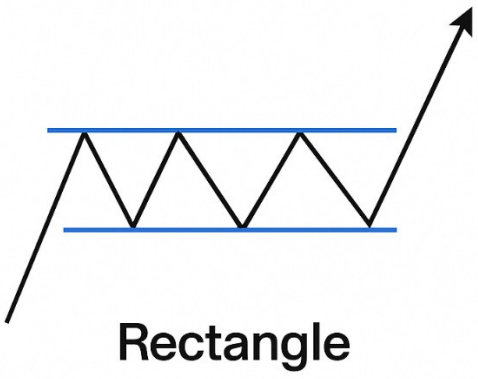

Figure - 4

4.6.2 Reversal Patterns

Reversal patterns signal a possible change in the direction of the existing trend. They often occur after extended price moves and can help traders anticipate significant turning points. Common reversal patterns include:

- **Head and Shoulders**: This pattern typically marks the end of an uptrend, with three peaks: a higher one in the middle (head) and two lower ones on either side (shoulders) as shown in Figure - 5.

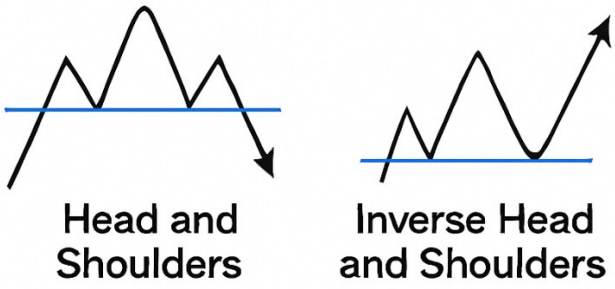

Figure – 5

- **Double Tops and Double Bottoms**: Two peaks or troughs forming near the same level, indicating a strong barrier to price movement in that direction (Figure – 6).

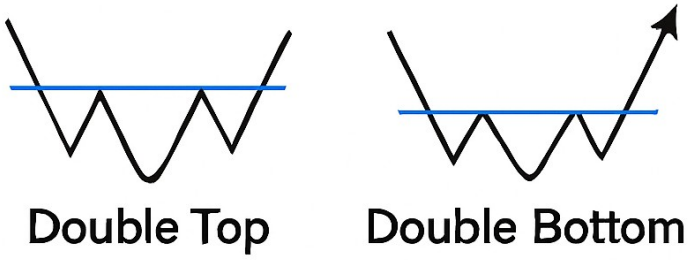

Figure - 6

- **Rounding Tops and Bottoms**: Gradual reversals that look like a curve or "saucer," indicating a slow shift in market sentiment.

  Mastering the interpretation of price patterns empowers the traders to predict potential price movements based on historical behavior and market psychology. While patterns are powerful tools, they must be interpreted within the broader context of volume, trend strength, and overall market conditions. A disciplined approach combining pattern recognition with other technical indicators often yields the most reliable trading strategies.

CHECK YOUR PROGRESS

VI. A "hammer" and "shooting star" are patterns associated with:
   a) Bar charts
   b) Candlestick charts
   c) Line charts
   d) Point & Figure charts

VII. The Relative Strength Index (RSI) is classified as a:
   a) Trend indicator
   b) Momentum indicator
   c) Volatility indicator
   d) Volume indicator

VIII. Bollinger Bands measure:
   a) Momentum
   b) Trend direction
   c) Volatility
   d) Volume flow

IX. Which continuation pattern looks like a small flag on the chart?
   a) Triangle
   b) Double top
   c) Flag
   d) Head and shoulders

X. A head and shoulders pattern signals:
   a) Continuation of a trend
   b) Imminent breakout
   c) Potential reversal
   d) Volatility contraction

4.7. FUNDAMENTAL ANALYSIS Vs. TECHNICAL ANALYSIS

It is important to understand the process of valuing securities and how prices will move in the future if one is to study investments and financial markets. The two major schools of thought in this arena are Fundamental Analysis and Technical

Analysis. Each has as an objective helping investors make informed decisions but they are distinct in terms of approach, emphasis, and implication. Knowing the distinction between these two is of great value to an investor who can then opt for the strategy aligning more with his own objectives, risk acceptance and investing style.

4.7.1 Meaning and Core Focus

Fundamental Analysis is the process of analyzing a security in order to determine its intrinsic value. This approach involves an examination of all items that may influence the security's value, from macroeconomic considerations such as the economy and industry trends, to microeconomic factors like the ability of a company's management. The emphasis is in the real value of an asset according to the performance of its underlying business. Whereas, the technical analysis does the opposite; it erases the intrinsic value. Instead, it analyses historical market data, most widely price and volume, to forecast price action in the future. The technical school posits that all the known fundamentals are already reflected in the price of a security and that stock prices move based on established trends, patterns, and mass psychology of the market.

4.7.2 Analytical Tools Used

Such fundamental factors include the Financial Statements (balance sheets, income statements, cash flow statements), Ratios (P/E ratio, debt-to-equity ratio, return on equity, etc.), Economic indicators (GDP growth, inflation rates, unemployment rates), Industry analysis, Management quality assessment etc. Technical Analysts generally make use of the instruments such as Price charts (line, bar, candlestick charts), Technical indicators (moving averages, RSI, MACD, Bollinger Bands), Chart patterns (head and shoulders, triangles, flags), Volume analysis and Oscillators and momentum indicators etc.

4.7.3 Time Horizon

The other big contrast is in the investment horizon. It is, as Fundamental Analysis is geared to long-term investment planning. It is also grounded on financial conditions and factors that occur over the long-term. Those interested in purchased under-priced stocks and holding them until they are properly valued generally favour fundamental analysis. Technical Analysis is more for short-term trading. Day, swing, and momentum traders frequently use technical analysis to take advantage of fast price swings.

4.7.4 Assumptions About the Market

The two methods also contrast as a result of their implicit premise. Fundamental Analysts believe that eventually the stock price will reflect the 'true' value of the

company. In other words, the short-term market is illogical but will soon self- correct. Technical Analysts, on the other hand, tend to believe that prices move in trends and that the past is likely to be reproduced. They view price movements as indicative of collective market psychology and behavior.

4.7.5 Data Dependence

Qualitative and quantitative information are extremely important in Fundamental Analysis. Key is financial releases, management outlook, sector performance, and economic reports. Technical Analysis, in contrast, is almost entirely quantitative and examines only numerical data of price, patterns, and statistical indicators with little regard for the asset's finances.

4.7.6 Reaction to News and Events

While news and events (for instance, earnings, mergers, regulatory shifts) send ripples through the market for technicians, Fundamental Analysts interpret news and events as reasons to reevaluate the intrinsic value of a security. A positive news event may cause them to increase the premium applied to the stock. But, for Technical Analysts the concern is more about the effect of news on prices and volumes. They do not judge the news as absolute "good" or "bad;" they watch for market reaction and adjust their strategies accordingly.

CHECK YOUR PROGRESS

XI. Line charts are best suited for long-term trend analysis due to their simplicity. **(True/ False)**

XII. Bar charts display only closing prices over time. **(True/ False)**

XIII. A support level can turn into resistance once breached. **(True/ False)**

XIV. A double top is considered a continuation pattern. **(True/ False)**

XV. Fundamental analysts focus on management quality and financial ratios. **(True/ False)**

XVI. Bollinger Bands contract when volatility decreases. **(True/ False)**

XVII. Volume Rate of Change (VROC) measures the speed of price movement. **(True/ False)**

4.8 LET US SUM UP

Despite being abundant of its unreliable applications, technical analysis is an almost irreplaceable line of study in the daily practice of most traders of all asset classes. The various theories already listed, Dow's, Elliot's and even that contrarian view the Random Walk one all serve as philosophy for interpreting market activity.

These theories are the interpretive stance towards market behavior and while financial markets have become increasingly hostile to and rewarding of the investment in

developing one's own technical skill set. Even in an era where Big Data and high-frequency trading algorithms are the new normal, the old-school basics of technical analysis still apply. Most of the newer systems combine machine learning and artificial intelligence, which tie historical technical analysis with quantitative analysis to generate more finely tuned trading signals. New stock trading practices are employed including Algorithmic trading, Sentiment Analysis, Quantitative Risk Management etc. Thus, technical analysis in itself gives short- term traders, swing traders, or investors a power to interpret market movement and thus every trader should have knowledge of technical analysis to better understand how the market works. The theories, approaches, metrics, and patterns that the present writing introduces, combine to represent a unified toolset for interpreting market structure and investor psychology. These instruments and the continual development of them in response to changing market conditions may give a substantial advantage in what is an otherwise uncertain space.

4.9 KEYWORDS

Technical Analysis Study of past price and volume to forecast future market movements.

Candlestick Chart Price chart with color-coded bodies showing open, high, low, and close.

Bollinger Bands Volatility bands plotted above and below a moving average.

Flag Pattern Short-term continuation pattern resembling a small rectangle.

Head and Shoulders Reversal pattern with three peaks signalling trend change.

Support A price level where buying interest tends to prevent further decline.

Resistance A level where selling pressure may cap further price increases.

4.10 ANSWERS TO CHECK YOUR PROGRESS

Q. No.	Answer	Q. No.	Answer	Q. No.	Answer
I	**C**	VII	**B**	XIII	**True**

II	**C**	VIII	**C**	XIV	**False**
III	**B**	IX	**C**	XV	**True**
IV	**C**	X	**C**	XVI	**True**
V	**C**	XI	**True**	XVII	**False**
VI	**B**	XII	**False**		

4.11 TERMINAL QUESTIONS

- Explain the foundational principles of the Dow Theory, including its primary assumptions about market trends and the significance of market averages.
- Describe the origins and underlying principles of the Elliott Wave Theory. Detail the structure of impulse and corrective waves also.
- Define the Random Walk Theory and assess its implications for market predictability.
- Compare different types of charts in terms of their construction, interpretative usefulness, and common applications in technical analysis.
- Identify and explain the significance of various market indicators. Elaborate that how these indicators can confirm trends and signal potential reversals.
- Define what is meant by support and resistance in the context of technical analysis. Explain how traders determine these levels and the role they play in forecasting price movements and potential reversals.
- Describe commonly observed price patterns in technical analysis. Explain how these formations are identified and interpreted, and discuss the implications they have for predicting future price moves.
- Compare and contrast the methodologies, assumptions, and outcomes of technical analysis and fundamental analysis.

Suggested Readings

- Desai and Joshi, Investment Management (Security Analysis and Portfolio Management), S. Chand Publications
- Prasanna Chandra, Investment Analysis and Portfolio Management, McGraw Hill
- Bhatt, Security Analysis and Portfolio Management, Biztantra Publications
- Tripathi and Panwar, Taxmann's Investing in Stock markets, Taxmann Publications Pvt. Ltd.
- Donald, Ronald and Ashwini, Security Analysis and Portfolio Management, Pearson Education
- Gurusamy, Financial Markets and Institutions, Vijay Nicole Imprints Pvt Ltd.
- Reilly, Brown and Leeds, Investment Analysis and Portfolio Management with MindTrap, Cengage Learning

- Kevin, Security Analysis and Portfolio management, PHI Learning Pvt. Ltd.
- William, Edwin and Stephon, Modern Portfolio Theory and Investment Analysis, Wiley India
- Tripathi, Taxmann's Security Analysis and Portfolio Management, Taxmann Publications Pvt. Ltd.

CERTIFICATE IN
STOCK MARKET AND TRADING OPERATIONS
Semester-I
GC-CST2: Basics of Security Analysis and Portfolio Management

UNIT V – PORTFOLIO MANAGEMENT

STRUCTURE:

5.0 OBJECTIVES

After studying this unit, you would be able to:

- Understand the meaning and definition of portfolio management
- Explore different types of portfolio management catering to different objectives
- Analyse the key features of an effective portfolio
- Evaluate the significance of portfolio management in achieving different objectives of the investor
- Examine the process and stages of portfolio management
- Understand the role of asset allocation and diversification in effective portfolio management

5.1 INTRODUCTION

Portfolio management can be viewed as a complex concept that overtime has developed along with the scope and intricacy of financial markets across the world. The quest for portfolio management strategies originated in financial theory as well as concerns for those who needed to invest their money; individuals as well as institutions. With the increasing complexity and globalization of financial markets, traditional “buy and hold” investing has recently been adapted for more sophisticated models. Therefore, portfolio management is no longer limited to pick one or two

good stocks, or bonds; but it incorporates risk management, diversification, asset allocation and constant monitoring and rebalancing according to the financial goals of the investor. In the widest view, portfolio management is the practice of deciding how to mix all available asset classes; such as stocks, bonds, real estate, commodities, cash, alternative investments to arrive at a portfolio that is in line with your own risk tolerance and objectives.

5.2 CONCEPT OF PORTFOLIO MANAGEMENT

The term portfolio management is not a unitary term. Its meaning may differ whether it is used in an academic, professional or investor context. Portfolio management is fundamentally about the constructing and maintain a set of investments designed to achieve long-term financial goals in a manner that minimizes risk and maximizes a set of specific resources. In the academic literature, Modern Portfolio Theory (MPT) has become synonymous with the concept of portfolio management. According to Markowitz's model, the structure of an investment portfolio needs to focus on maximum return for a given degree of risk and the importance of diversification is particularly stressed. Risk is not just the sum of the risks of the individual assets in the portfolio; it also depends on the correlations of the returns of these assets. Because of this a very central concept in the portfolio management is the efficient frontier and all of the theoretical approaches in the portfolio management are based on the mathematical optimization of return and risk. The academic definition is of a more quantitative nature, often involving modeling and various types of statistical measurements.

For the investment professional, portfolio management is not merely selecting the securities for the portfolio. It includes defining investment goals, assessing risk tolerance, making asset allocation decisions, and ongoing portfolio monitoring. It is often described as "ongoing decisions to mix investments based on macroeconomic conditions as well as individual asset performance". This is a fluid exercise that would typically seek to reevaluate and find an equilibrium that makes the investment portfolio consistent with the investor expectations. Plus, discipline in portfolio management is a common point made by even experienced practitioners, in the sense that it is not enough to have a good portfolio from the start, but to manage it and adjust it as markets and investors require. However, for the individuals, managing a portfolio is simply a means to an end, often focused on specific financial goals and conducted in a systematic way with a concurrent effort at risk minimization. From saving for retirement, saving for a child's education, to saving up for a big-ticket purchase, sound portfolio management sets a plan that will do just that, maximize potential profits with one's acceptable level of risk. For many, the word portfolio and diversification go hand in hand, it is believed that if you invest in a range of asset classes it will smooth the ups and downs of any particular investment.

Therefore, it can be concluded that the term portfolio management refers to the management of a group of investments intended to meet overall financial goals including. Among others, this refers to:

- Asset Allocation: The distribution of investments across various types of assets.
- Security Selection: Picking individual securities within each asset class.
- Risk Management: Understanding risks assigned to investments and using portfolio diversity as a means to control the overall risk of a portfolio.
- Performance Review: Frequent review of asset performance versus benchmarks and modifying the portfolio when necessary.

Therefore, managing portfolios is not just a technical thing to do but also a strategic one. It combines theory, market research, behavioural finance and often an ethical perspective in order to construct a strong investment plan. Functionally it is the context for decisions and strategies to ensure that all investment decisions are made within the financial context.

5.3 TYPES OF PORTFOLIO MANAGEMENT

Based on different levels of such characteristics as active intervention, participation of the client, the investing technique being used and the types of assets, there can be identified different types of portfolio management. Characterizing these two types can assist an investor or manager in selecting the methodology that can be more adequate/promising for his or her own financial objectives and risk acceptance.

5.3.1 Active Portfolio Management: It is a more active practice than passive portfolio management in those managers or investors usually select investments rather than using an index for the benchmark. Proponents of active management are prudent of market directions, conduct intensive research on individual securities, and frequently shift their holdings based on what is happening in the market. Ideally, the objective is to buy inexpensive securities and to short sell overpriced ones so that by the time the market adjusts you have already taken your profits or closed your positions. It does, but, require significant market understanding as well as a strong research team, and quick decision making.

5.3.2 Passive Portfolio Management: Passive funds, in contrast, are characterized by a "set-it-and-forget-it" technique. Passive involves not actively trading and just mirroring a market index. The goal should not to be beat the markets, but simply track it with lower fees and less turnover. Frequent methods for constructing passive portfolios are with index funds or exchange-traded funds (ETFs) that give exposure to the broad market. Passive strategies have been growing in popularity because they are simpler, less expensive, and often do as well, if not better over the long-term, then active management.

5.3.3 Discretionary Portfolio Management: In this case, the client gives the portfolio manager the power to take decisions on behalf of himself. This delegated manager can also buy or sell from his managed portfolio without the approval of a more centralized investor. This is a very attractive model for those investors that want their money handled by professionals and have no desire to be directly engaged in the day to day investing process.

5.3.4 Non-Discretionary Portfolio Management: This model allows investors to retain control over their investment decisions while still receiving expert advice. In non-discretionary management, portfolio managers provide recommendations and suggest strategies, but the final investment decisions lie with the investor. This approach is ideal for those who want a blend of professional insights and personal control.

5.3.5 Strategic Asset Allocation: It bases the asset mix at a long-term level according to the investor's objectives and risk profile. The strategic asset allocation is revisited periodically and doesn't vary that much over time. The concept being that it maintains a set ratio between types of investments irrespective to the movements of the market in the short-run.

5.3.6 Tactical Asset Allocation: Tactical asset allocation is the short-term shifts in asset allocation based on changing market conditions or current opportunities. It also allows for the manager to take advantage of market "inefficiencies," or short-term opportunities while maintaining the general strategic framework.

5.3.7 Robo-Advisory Portfolio Management: Robo-advisors use computer algorithms and models to automate the asset allocation and rebalancing process. For people with limited funds, they are a cheap and easy solution.

5.3.8 Thematic and Sector-Based Management: This type specializes in particular sectors or investment themes like technology, renewable energy, or real estate. But, a portfolio designed around an overall theme may also bring incommensurate risks and expected returns.

5.3.9 Liability Driven Investment (LDI): LDI strategies are most commonly employed by funds like pension funds and used to align the assets in a portfolio with the liabilities so that future obligations can be met consistently.

5.3.10 Multi-Asset and Global Portfolio Management: Diversifies investments across different geographical areas and financial instruments in order to take advantage of growth available at a global level and reduce probabilistic risks.

The advantages of each can be seen depending on an investor's approach ideal for market conditions and the type of investor. An investor who is seeking active participation or willing to take on more risk may be more inclined toward active management while a conservative investor may favour passive or strategic asset allocation due to the steadier returns in the long-run.

5.4 FEATURES OF PORTFOLIO MANAGEMENT

Literacy on the fundamentals of portfolio management is critical in designing and maintaining a solid, unwavering and one that conforms with one's long-term goals. These aspects do not, only describe how portfolio management should be conducted, but they are also some fundamental pillars that develop successful investment strategies.

5.4.1 Diversification: Diversification is probably the best-known tenet of portfolio management. The thought process goes something like: by diversifying into multiple asset classes, sectors, or countries we can lower our exposure to unsystematic risk. Because a mix of asset types can be purchased that are not perfectly correlated with each other, the underperformance of one asset class can be overcome by the over performance of another. It dampens portfolio volatility while also increasing risk adjusted returns.

5.4.2 Asset Allocation: Asset allocation is the decision about the percentage of each asset class to hold in an investment portfolio. This is a basic decision informed by the investor's appetite for risk, financial objectives, time frame, and view on the market. Asset allocation is the most important decision made in terms of managing a portfolio because it has the most impact on the expected return and risk of the portfolio.

5.4.3 Risk Management: Risk management is the process of systematically identifying, analyzing, and minimizing risks that may negatively impact the performance of the portfolio. This capability includes the use of hedging instruments, stress testing, stop-loss order and other tactical adjustments.

5.4.4 Performance Measurement and Benchmarking: The key to successful management of investment is the continuous measurement against a standard established of how the portfolios perform. Managers can evaluate whether they are correctly performing their strategy by benchmarking the return of the portfolio to the market, or a benchmark made by the manager themselves. KPIs such as the Sharpe ratio, alpha and beta provide an indication of the portfolio's efficiency and return given its risk.

5.4.5 Rebalancing: Even the best-designed portfolio will over time become distorted from the asset allocation that was incorporated into it. Rebalancing is the process of returning the portfolio to its target asset allocation on a periodic basis. This is essential as it crystallizes profits, takes or manages risk, and ensures that the portfolio does not deviate from the original long-term plan of the investor. The rebalance may be time based, or may be set by an acceptable variance in the portfolio's allocation.

5.4.6 Liquidity Management: This is especially critical during market dislocations, or in the case where an investor must "unwind" her or her positions quickly. Liquid reserves are part of portfolio management discipline in order to maintain an adequate liquidity or quick to sell assets in the form of assets that liquidates without significant

loss in value. Being liquid has its advantages in being able to capture short-term opportunities in the market or being able to fund short term liabilities.

5.4.7 Cost Efficiency: Management expenses, trading costs such as commissions and fees can eat into the overall return. The cost effectiveness of the investment strategies is one of the priorities for portfolio management. This means using inexpensive tools when feasible and reducing the access trading which can entail unnecessary costs. Even for those involved in active management, cost containment helps improve net returns.

5.4.8 Customization and Flexibility: Investors all have different financial goals, risk levels and time horizons. Portfolio management must necessarily be adaptable to be effective. No matter whether you are an individual investor or an institutional client, the portfolio should be crafted in accordance with your specific wants. This personalized approach means that portfolio managers need to be flexible and customized, adapting to the investor's variable life conditions, and following shifts in the market.

Each of these features works in unison to create a resilient and performance-oriented portfolio. They also illustrate how portfolio management is not a static discipline but a continuously evolving process that must adapt to external changes and personal circumstances.

CHECK YOUR PROGRESS

I. According to Modern Portfolio Theory, the risk of a portfolio depends on:
   a) The sum of individual asset risks
   b) The standard deviation of the highest-risk asset
   c) The correlations among asset returns
   d) The total number of assets

II. The efficient frontier represents:
   a) Portfolios with the highest expected return for each level of risk
   b) The maximum loss possible in any portfolio
   c) The boundary beyond which no more assets can be added
   d) Portfolios with zero correlation among assets

III. Asset allocation is primarily the decision to:
   a) Select individual stocks within one sector
   b) Distribute funds among different asset classes
   c) Time the market for entry and exit points
   d) Hedge currency risk only

IV. Diversification reduces risk by:
   a) Holding only low-volatility assets
   b) Investing in both stocks and bonds of the same company

c) Combining assets that are not perfectly correlated
d) Focusing on a single high-return asset

V. Which type of portfolio management involves mirroring a market index?
a) Active management
b) Discretionary management
c) Passive management
d) Tactical allocation

VI. A discretionary portfolio manager:
a) Must get client approval on every trade
b) Can trade on behalf of the client without prior consent
c) Only provides written recommendations
d) Tracks an index without deviation

5.5 SIGNIFICANCE OF PORTFOLIO MANAGEMENT

Portfolio management is an extremely relevant discipline in present day financial contexts. Following points highlights the significance of the portfolio management in the present times:

5.5.1 Achieving financial objectives: Essentially, because portfolio management is predicated upon the necessity of attaining certain financial objectives – be they accumulating wealth over time, earning income, or preserving capital. Investors have reasons for coming to the market, be it saving for retirement, paying for their kid's college or perhaps an emergency fund. These elements are articulated via a clear investment plan that seeks risk/return alignment through prudent portfolio management. Establishing an investment mandate and a vision help to harness investor attention, increasing the focus on playing for the long-term versus short-term fluctuations in the market that may encourage them to stray from their plan.

5.5.2 Managing risk and volatility: Risk reduction is a major accomplishment of portfolio management. Financial markets are uncertain, and therefore abrupt or extended bear markets could set in at almost any time. Diversification, hedging and strategic asset allocation are tools used to insulate a portfolio from the negative effects of market shocks. Avoiding the mistake of "putting all eggs in one basket" can decrease the unsystematic risk and make the portfolio more robust against economic cycles.

5.5.3 Enhancing returns through strategic allocation: Portfolio management also helps in maximizing returns in addition to managing risk. Governance is not just about socializing risk, in other words, but also about where to place money in order for it to grow. These undervalued or high potential assets are discovered by portfolio managers utilizing research, market insights and quantitative Modeling.

5.5.4 Responding to market dynamics: Geopolitical events, economic movements, technology, and consumer preference all dramatically shift and reshape contemporary marketplaces. Portfolio management is the framework for being able to adapt to these changing environments. But through being responsive to market conditions, be it by moving into defensive equities in times of high uncertainty or leveraging key trends with opportunistic asset allocation, a sound process for managing an investment portfolio keeps investments abreast and profitable within the ever-changing circumstances they must continue to perform.

5.5.5 Institutional significance and economic impact: Portfolio management is also critical for many large institutional investors, e.g.: pension funds, endowments, insurance companies, and sovereign wealth funds, beyond the individual investor. These actors must also be concerned with returns but must also be concerned with protecting against risks, which would affect the beneficiaries and policy holders. In addition, despite the need for re-investment those societal objectives, and the regulations that demand such re-investment, traditional financial services still must find a way to adapt their management of investments to offset funding their short-term liabilities. Portfolio management can therefore also help in creating stability and fostering economic growth at a macro level.

5.5.6 Behavioural finance and investor psychology: An even more intangible although no less crucial portfolio benefit of portfolio management is as a psychological dampener to the investor. Markets are also inherently emotional and sentiment can cause irrational enthusiasm or irrational fear which also leads to bad decisions. Having an explicit process or set of strategies to follow gives investors structure to adhere to when it is needed most and can help counteract a behavioural bias. Avoiding being swayed by the noise is more likely to provide investors with a consistent compounding of their portfolio over time by following a well-developed and chronicled plan, rather than reacting on impulse.

In other words, portfolio management helps translate desired but abstract financial objectives into portfolios that are concrete and dynamic and can thus be implemented in an organized fashion. It is the space that shapes the ambition to a goal, providing investors the possibility in capitalizing on a very complex Financial Market, to accomplish what is desired. Whether through risk management, strategic allocation, or behavioural discipline, effective portfolio management is an indispensable tool for navigating the uncertainty and opportunities presented by modern financial markets.

5.6 PROCESS OF PORTFOLIO MANAGEMENT

The process of portfolio management includes the entire chain of the steps that turns a pool of capital into an organized and active investment portfolio. This process is not a one-off thing but is repeated continuously and enhanced to keep the portfolio in line with new market conditions and investor's new objectives. The steps or stages of the

portfolio management are highlighted in the Figure – 1 and are also explained below:

5.6.1 Setting objectives and defining goals: A clearly defined set of financial objectives should be the basis for all portfolio management activities. Regardless of the goal, and whether it be for capital appreciation, income, or capital preservation, a clearly defined objective is needed. It may include deciding the time horizon, risk tolerance and other considerations like liquidity requirements, tax situations, and regulatory issues that might affect portfolio decisions. The importance of clear goal-setting is that it lays the foundation for the rest of the process and sets the stage for identifying realistic and culturally specific financial goals.

Figure-1

5.6.2 Strategic asset allocation: after identifying the goals and objectives of the portfolio management, the next logical step is to strategically assign resources and funds to different assets or investment opportunities. It determines what combination of assets including stocks, bonds, commodities, real estate and cash are best suited for the individual needs of the investor. The structure of the portfolio is in many respects anchored by a strong asset allocation plan, over which security selection can hopefully add value. It is generally done considering the following aspects:

- Risk and Reward Balance – The asset mix chosen must provide the desired level of return without taking on more risk than is needed or acceptable.
- Diversification – meaning the portfolio is not over concentrated on any one asset class or sector.
- Macroeconomic determinants – which include economic indicators, trends in interest rates and cycles in the marketplace.

5.6.3 Security selection and investment strategy: The specific securities that will be used in the portfolio are the focus of this step in the investment process, and are selected after having developed a strategic asset allocation. It is generally done using fundamental and technical analysis. Fundamental analysis includes analysis of balance sheets, income statements, and cash flow statements to access the intrinsic value of prospective investments, whereas, decision based on technical analysis are done analyzing trends, volumes and price patterns to time entries and exits. In addition, quantitative models and risk analysis tools that help maintain alignment with the overall investment strategy are frequently used in the selection of securities.

5.6.4 Risk management and hedging strategies: Similar to security selection, trades, and investing, risk management is an ongoing consideration in the portfolio management process. The Portfolio is the first step, but we must then identify where our risks are and have a plan to mitigate them. Various hedging techniques like the options, futures or swaps etc. can be used to shield oneself from market volatility. Use of stop-loss orders and stress testing can also be done at this stage.

5.6.5 Implementation and execution: Once the plan is developed, the next stage is to start executing the plan. This may include placing trades order for the purchase of the securities according to the asset allocation plan. Other than prices, we need to keep a watchful eye on transaction fees and make sure execution occurs as cost effectively as possible. Using sophisticated trading systems and portfolio management software for ease of execution can also be considered. Implementation should not be thought of as an event, but as a process. Given fluctuating market conditions, this may entail some rebalancing or position adjusting in order to remain on course with the strategic plan.

5.6.6 Monitoring, evaluation, and rebalancing: A regular follow-up to monitor the performance of the portfolio against parameters established at the outset is crucial once the execution takes place. It may include:

- Performance Measurement: Measuring performance through tools such as the Sharpe ratio, alpha, beta, and tracking error.
- Benchmarking: Measuring performance in relation to relevant indices or ii created benchmarks.
- Rebalancing: Adjusting the portfolio from time to time in order to bring the portfolio back to the targeted asset allocation. This can be done either on a calendar basis such as annually or quarterly, or when the portfolio shifts beyond the desired ranges or a limit.
- Monitoring Economic Environment: Remaining aware of macroeconomic indicators, shifts in regulation, and new market opportunities that may need to be accounted for a effective portfolio management.

5.6.7 Reporting and communication: In the case of a discretionary management, clear communication is fundamental for the whole portfolio management process since the investor needs to be informed about everything related to the performance and make regular updates. Good reporting typically comprises periodic statements, performance attribution etc. Periodic statements are important as these are summary documents showing portfolios and performance and transaction reports and information concerning changes. The performance attribution includes the attempt to explain the cause of gains and losses, and thus provide some information about the skill of the manager. Other than these, communicating the possible implications of market conditions on future decision-making and adapting strategy as necessary from time to time is also very critical.

When it comes time to manage the portfolio, the nature of the financial markets is changing, therefore continuous improvements and the learning is very crucial. Continuous updation of the knowledge about the market and economic conditions, and the recent updation in the field of technology are also very important for the effective portfolio management.

CHECK YOUR PROGRESS

VII. Modern Portfolio Theory emphasizes diversification to manage risk. **(True/ False)**

VIII. Active managers often conduct intensive research and trade frequently. **(True/ False)**

IX. Discretionary management requires client sign-off on every trade. **(True/ False)**

X. Tactical asset allocation involves short-term shifts based on market views. **(True/ False)**

XI. Rebalancing can crystallize gains and maintain target risk levels. **(True/ False)**

XII. Liquidity management is irrelevant for long-term portfolios. **(True/ False)**

XIII. Robo-advisors eliminate human bias through algorithmic rules. **(True/ False)**

XIV. Non-discretionary clients make final investment decisions themselves. **(True/ False)**

XV. Benchmarking helps assess manager skill by comparing to an index. **(True/ False)**

XVI. High trading costs enhance overall portfolio returns. **(True/ False)**

XVII. Liability-driven investment strategies align assets with future payouts. **(True/ False)**

XVIII. Portfolio management is a one-time setup with no ongoing adjustments. **(True/ False)**

5.7 LET US SUM UP

It is clear from the previous sections of the discussion that a strong portfolio management is rooted in clarity, discipline, vision and most importantly rigor in remaining adaptive to change. This is the process that has made the complexity of the global financial markets an opportunity for growth and stability. In today's environment with continued market turmoil and altered economic environments, having a sound portfolio management approach is what will continue to help you reach your financial goals. It is a trade-off between coping with the moving sands of markets, technology, and investor's needs and agendas. These concepts and approaches are a universal recipe, whether you are investing for yourself, or others. With changing market conditions and new investment opportunities, investors just need to remain informed and disciplined and flexible. Approaching portfolio management in the comprehensive manner described in this book, beginning with the planning process and including all of the elements of risk and monitoring and adjustments, is a way to manage investing in the labyrinth of the developed financial markets and is a way to work towards your financial goals without needing to be afraid. Thus, good portfolio management is not so much a goal to strive toward as it is an ongoing process of learning, adapting, and acting. It is a powerful instrument that can help investors create and preserve and build wealth over time.

5.8 KEYWORDS

Diversification	Combining uncorrelated assets to reduce overall portfolio risk.
Asset Allocation	Decision on how to split investments among different asset classes.
Rebalancing	Periodically restoring asset weights to their target allocations.
Sharpe Ratio	Measure of risk-adjusted return comparing excess return to portfolio volatility.
Robo-Advisor	Automated platform using algorithms to manage and rebalance portfolios.
Benchmarking	Comparing portfolio performance against a relevant market index.
Tactical Allocation	Short-term adjustments to asset mix based on market conditions.

5.9 ANSWERS TO CHECK YOUR PROGRESS

Q. No.	Answer	Q. No.	Answer	Q. No.	Answer
I	**C**	VII	**True**	XIII	**True**
II	**A**	VIII	**True**	XIV	**True**
III	**B**	IX	**False**	XV	**True**
IV	**C**	X	**True**	XVI	**False**
V	**C**	XI	**True**	XVII	**True**
VI	**B**	XII	**False**	XVIII	**False**

5.10 TERMINAL QUESTIONS

- Define portfolio management in your own words and discuss its importance in achieving long-term financial goals.
- Identify and explain the various types of portfolio management. Compare and contrast these approaches by discussing their advantages.
- Examine the fundamental characteristics that contribute to the success of a portfolio. Provide examples to show how these characteristics interact in practice.
- Discuss how portfolio management plays a critical role in financial planning and wealth management.
- Delve into the concept of asset allocation and explain why it is a cornerstone of effective portfolio management. Also highlight different asset allocation strategies which can help to manage risk and boost returns.
- Compare the portfolio management strategies of individual investors with those of institutional investors.
- Analyse how changes in market conditions, such as volatility, economic cycles, and unexpected market shocks, affect portfolio performance.

Suggested Readings

- Desai and Joshi, Investment Management (Security Analysis and Portfolio Management), S. Chand Publications
- Prasanna Chandra, Investment Analysis and Portfolio Management, McGraw Hill
- Bhatt, Security Analysis and Portfolio Management, Biztantra Publications
- Tripathi and Panwar, Taxmann's Investing in Stock markets, Taxmann Publications Pvt. Ltd.
- Donald, Ronald and Ashwini, Security Analysis and Portfolio Management, Pearson Education
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- Reilly, Brown and Leeds, Investment Analysis and Portfolio Management with MindTrap, Cengage Learning
- Kevin, Security Analysis and Portfolio management, PHI Learning Pvt. Ltd.
- William, Edwin and Stephon, Modern Portfolio Theory and Investment Analysis, Wiley India
- Tripathi, Taxmann's Security Analysis and Portfolio Management, Taxmann Publications Pvt. Ltd.

CERTIFICATE IN
STOCK MARKET AND TRADING OPERATIONS
GC-CST2: Basics of Security Analysis and Portfolio Management

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UNIT VI – PORTFOLIO THEORIES

STRUCTURE:

6.0 OBJECTIVES OF THE LESSON

The primary goal of this lesson is to familiarize students with the concept of portfolio diversification and how to calculate its associated risk and return. It is possible to create a portfolio of efficient securities that minimizes risk while attaining a target return. To achieve this, several portfolio theories have been discussed in this chapter, including Markowitz's theory, Capital Market Theory, Arbitrage Pricing Theory, and Sharpe's model.

6.1 INTRODUCTION

Investment decisions are primarily driven by the trade-off between risk and reward, with the majority of investors focusing on the financial returns from their investments. The risks that influence returns can generally be divided into two categories: those that affect the entire market, such as market or interest rate risk, and those that are specific to individual securities, like business or financial risk. Thus, total risk can be divided as systematic risk and non-systematic risk,viz.a general (market) component and a specific (issuer) component, which are additive:

Total risk = General risk + Specific risk

= Market risk + Issuer risk

= Systematic risk + Non-systematic risk

Systematic Risk: It refers to the part of the overall risk that cannot be reduced through diversification. Also known as market risk, it represents the uncertainty that cannot be eliminated by an investor. This type of risk leads to fluctuations in a security's returns, which are directly influenced by large-scale market or economic trends. It stems from external factors affecting industries or businesses, with significant consequences, including events like war, changes in interest rates, market shifts, or inflation.

Non-systematic Risk: The variance in a security's total returns that is independent of market performance constitutes non-systematic (non-market) risk. This risk is diversifiable and is specific to a given security ,company or industry and is linked to other risks, including business risk, financial risk and liquidity risk.

6.2 MEANING OF PORTFOLIO

A combination of securities is called a Portfolio. Each individual creates his portfolio of assets on the basis of his wealth, earnings and preferences. The greater the variability of returns, larger is the risk. The Modern portfolio theory is based on the need for maximization of returns through a combination of securities, whose variability is lower. The solution lies in diversification, which helps reduce the portfolio's overall risk by spreading investments across a mix of assets with varying degrees of risk and return profiles .Consequently, risk of one security can be offset by the risk of another security, partly or fully, thereby making the portfolio safer. The variability of each security and covariance for their returns reflected through their Inter- relationships need to be considered.

A portfolio is efficient if it is expected to yield the highest return at the lowest risk. A set of efficient portfolios can be generated by combining various securities, whose combined risk is lowest for a given level of return for the same amount of investment that the investor intends to invest.

6.3 MARKOWITZ THEORY: The qualification of risk and the need for optimisation of returns with minimum risk are the contributions of Markowitz. This is known as the Modern Portfolio Theory, which emphasizes the trade- off between risk and returns.

Assumptions of Markowitz Theory

i. The investors are rational and behave in a manner so as to maximize their returns.

ii. All investors are risk averse.

iii. All investors prefer higher returns to lower returns for a given level of risk

iv. The market is efficient and it is not possible to earn superior returns continuously through technical or fundamental analysis.

v. Investors have free access to fair and correct information on the returns and risk.

vi. The rate of returns and standard deviation are vital parameters for deciding the worth of an investment.

vii. Greater the risk, larger the return and vice- versa.

6.3.1 Markowitz Approach: Two security scenario

When two securities, negatively correlated, are included in a portfolio, risk can be minimized because the gain on one can be offset by the loss on the other.

For example, there are two securities, A and B. Their expected returns and proportionate investment is as follows:

	Expected Return (RI)	**Proportion (W)**
A	15%	20%
B	25%	80%

The return on the portfolio Rp, by taking a combination of these two securities will be

$Rp=\Sigma wiRi$

= (0.15) (0.20)+(.25)(.8)=23%

Now, we consider fresh data for Markowitz two security analysis.

Assume the following securities C and D

Security C	**Security D**	
Return(%)	7 Or 11	13 or5
Probability	. 5 each return	. 5 each return
Expected return(%)	9*	9**
Variance %	4	16
Standard deviation	2	4

C and D have same expected return

*Expected return= (.5) (7) +(.5) (11) =9

**Expected return=(.5) (13) +(.5) (5) =9

It is evident that the expected return of C and D is same, that is9%, but D is riskier than C as their standard deviations are 4% and 2% respectively.

If we assume that when C's return is high, D's return is low and vice-versa, this implies, when return on is C is 11%and that on D is 5% or when return on C is 7% , return on D is 13%

An investor would like to construct a portfolio consisting of some C and some D, which would be superior to an exclusive holding of C alone.

If we construct a portfolio consisting of two-thirds stock of C and one third stock of D, the average return on this portfolio would be the weighted average return of each security in the portfolio, given by

Rp = Σ WiRi,

$$R_p = \sum_{i=1}^{n} w_i r_i$$

Where:

R_p = Portfolio Return

w_i = Initial portfolio weight of the investment i

r_i = return of the investment i in the period

n=Total number of securities in a portfolio.

Therefore,

Rp= (2/3) (9) +(1/3) (9) =9

In periods when D is a better investment

Rp= (2/3) (7) +(1/3) (13) =9

And in periods when C turns out to be more lucrative

Rp= (2/3) (11) +(1/3) (5) =9

Thus, it is evident that by investing a part of the money in the riskier stock D, risk can be reduced significantly as compared to investing only in the less risky stock C. If we hold only stock C, the expected return would be 9% which would fall down to 7% in adverse times or as much as 11%in prosperous times as the standard deviation is 2 %. Thus, holding a combination of two-thirds of C and one- third of D, the expected and actual return will always be 9%, with standard deviation of zero. The risk of portfolio is reduced by juxtaposing one set of variations against another. This hedging is possible when one can find two securities whose behaviour is inversely related as C and D, as discussed earlier.

6.3.2 Markowitz Approach: The risk of a portfolio

The risk of a portfolio is not merely the sum of the risks of its individual components. The way securities interact with each other through correlations, can significantly affect the overall risk of the portfolio.

When a security is added to a portfolio that has a higher risk than any of the individual securities already in the portfolio, it does not necessarily mean the portfolio's risk will increase. In fact, it could lower the overall portfolio risk if the added security is not perfectly correlated with the other assets. This phenomenon highlights the importance of the correlation between assets and how it can reduce overall portfolio risk, even when individual securities may have high risk. Thus, it is

pertinent to calculate the interactive risk between the securities, which is Covariance. The covariance would be considered as positive if the rate of return of two securities move together and vice-versa. If the rates are independent, Covariance is zero.

The formula for calculating Covariance is
COV xy=I/NΣ(Rx - $\bar{}$Rx) (Ry- $\bar{}$Ry),where probabilities are equal
N= number of observations
COV xy= Covariance between x and y
Rx= Return on security X
Ry= Return on security Y
Rx and Ry = expected returns on security X and Y.
The coefficient of correlation is another measure to indicate the similarity/ dissimilarity in the behavior of two variables, which is expressed as
Rxy= COV xy/QxQy
Rxy= Coefficient of Correlation between x and y
COV xy=Covariance between X and Y
Qx= Standard deviation of X
Qy= Standard deviation of Y

6.3.3 Self-check exercise: Explain the two security case under Markowitz approach.

6.4 CAPITAL MARKET THEORY

CAPM is a relationship exploring how assets should be priced in capital markets. This theory is an extension of the portfolio theory of Markowitz.

6.4.1 Assumptions

I. Investors make decisions on the basis of risk- return assessments.
2. The purchase and sale transactions can be done in infinitely divisible units.
3. There is perfect competition and no single investor can influence prices, with no transaction cost involved.
4. Investors can short sell any number of shares without limit.
5. Personal income taxation is assumed to be zero.
6. Investors can borrow/ lend any amount of funds desired at an identical risk-less rate,eg. Treasury Bill rate.
7. There are no transaction costs.
8. Investors have similar expectations related to returns.

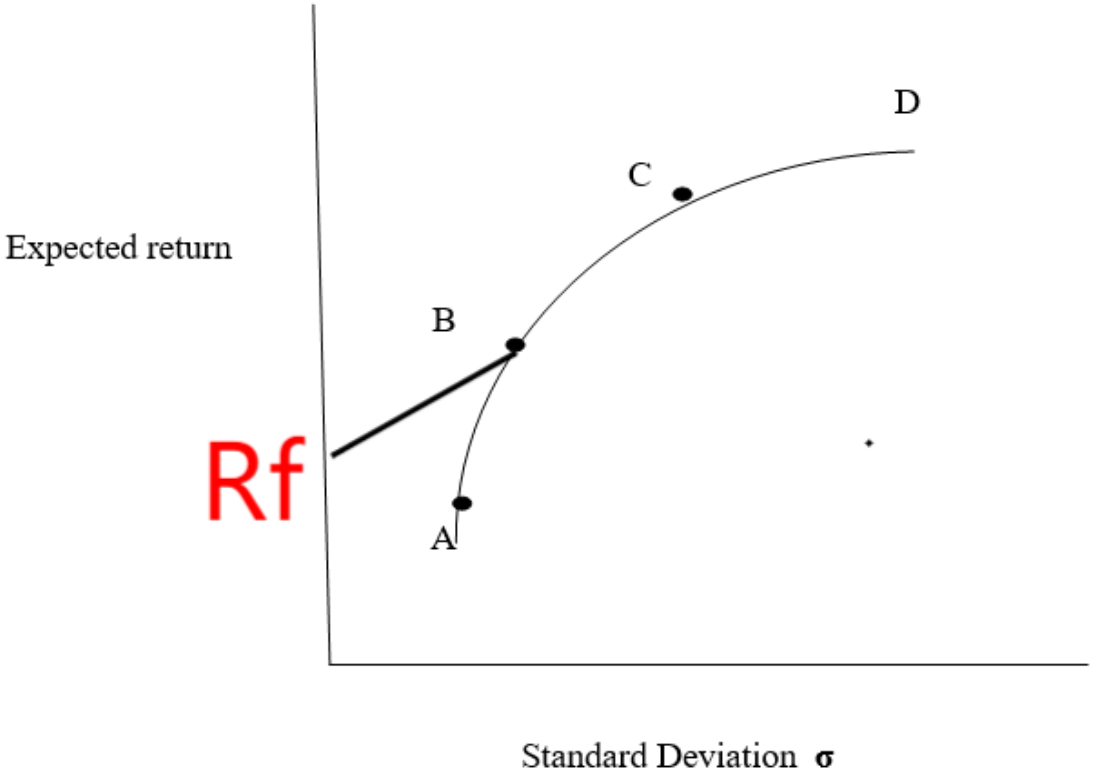

Figure1.Efficient Frontier with introduction of lending

6.4.2 Capital Asset Pricing Model

It is a widely used finance theory that establishes a linear relationship between the expected return on an asset and its risk, relative to the market. The model helps in determining the appropriate required return on an asset, considering its risk in comparison to the broader market.

Efficient Frontier is a set of optimal portfolios that provide highest expected returns at a defined level of risk. Each investor faces an Efficient Frontier ,which varies among investors due to difference in expectations.

If lending and borrowing are introduced, the Efficient Frontier line can be thought of to be a straight line. Lending is similar to investing in a risk- less security,(eg. Treasury bill, savings account) say of Rf in Figure 1. Rf= Risk free investment. Borrowing can be considered as the use of a margin.

If the investor places part of his funds in risk- free assets(Rf) and part of his funds in risky securities (B) along the efficient frontier, he would generate portfolios along the straight line segment RfB

Rp=XRm +(1-X) Rf,

Where Rp= expected return on portfolio

X= percentage of funds invested in risky portfolio

(1-X) =percentage of funds invested in risk-less assets

Rm= expected return on risky portfolio
Rf= expected return on risk-less assets
σp= Xσm
σp= expected standard deviation of portfolio
σm= expected standard deviation on risky portfolio
X= percentage of funds invested in risky portfolio

If borrowing and lending are introduced, efficient frontier line can be thought of as a straight line. The introduction of borrowing funds will change the shape of efficient frontier to the right of B as depicted in Figure2.If all investors face similar expectations and same lending and borrowing rate, the Efficient Frontier will be as denoted in Figure2.The portfolio of assets held by any investor will be similar to the portfolio of any other investor.

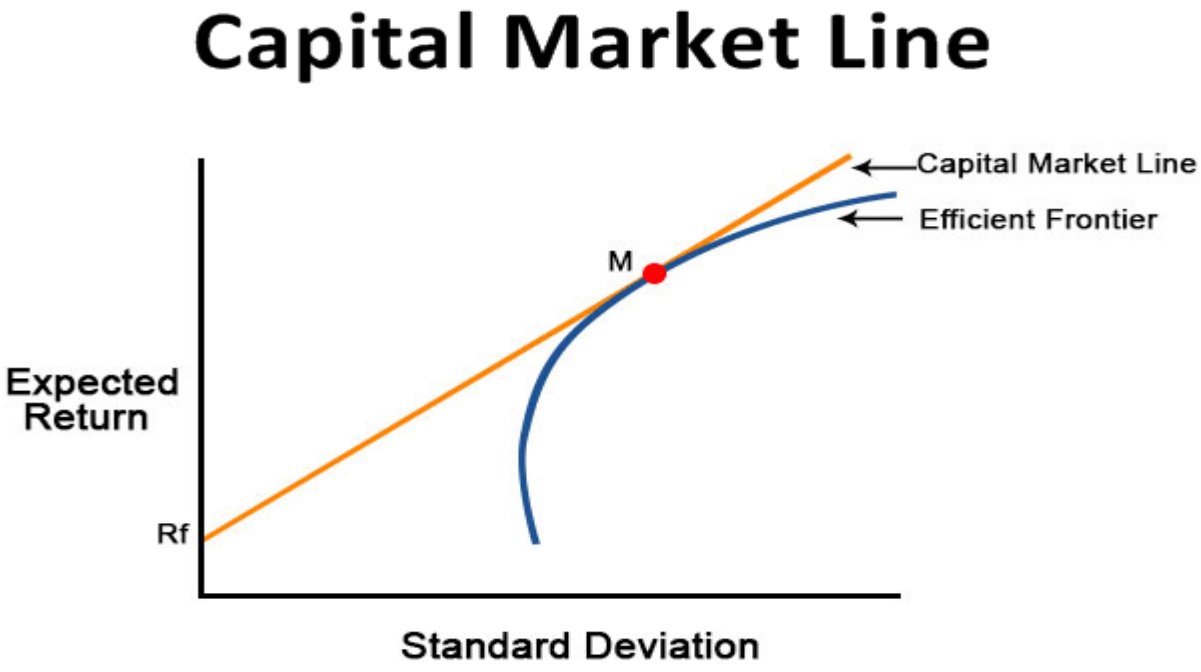

Figure2: Capital Market Line assuming Borrowing and Lending at risk free rate

M is the optimal portfolio of risky investments. The investor needs to decide how much to borrow or lend to attain their desired risk level. The decision to purchase at M is the investment decision and decision to buy some risk-less assets (lend) or to borrow (leverage the portfolio) is the financing decision. All investors should hold identically risky portfolios by combining portfolio M with lending and borrowing.

6.4.3 Capital Market Line

If all investors hold the same risky portfolio, then in equilibrium, it must be the market portfolio. Thus, RfM straight line is the Capital Market Line. All investors choose along this line as efficient portfolios will be on this line. The portfolios which are not efficient will be below the line. The equation of the capital market line connecting the risk-less assets with a risky portfolio is

Re= Rf+(Rm-Rf).σe
σM

(Rm-Rf)/σM depicts the extra return gained by increasing level of risk by one unit on an Efficient Frontier.

Rf= risk-free return for abstaining consumption for period one.

Thus, Rf is the price of time, that is, price paid for delaying consumption for one period.

σe= risk on efficient portfolio

Thus,expected return on an efficient portfolio is

(Price of time)+(Price of risk)(Amount of Risk)

(Rf)+(Rm-Rf)(σe)
σM

6.4.4: Security Market Line

Security Market Line, as depicted by Figure 3, indicates the relationship between expected returns from a stock and risks associated with that asset.

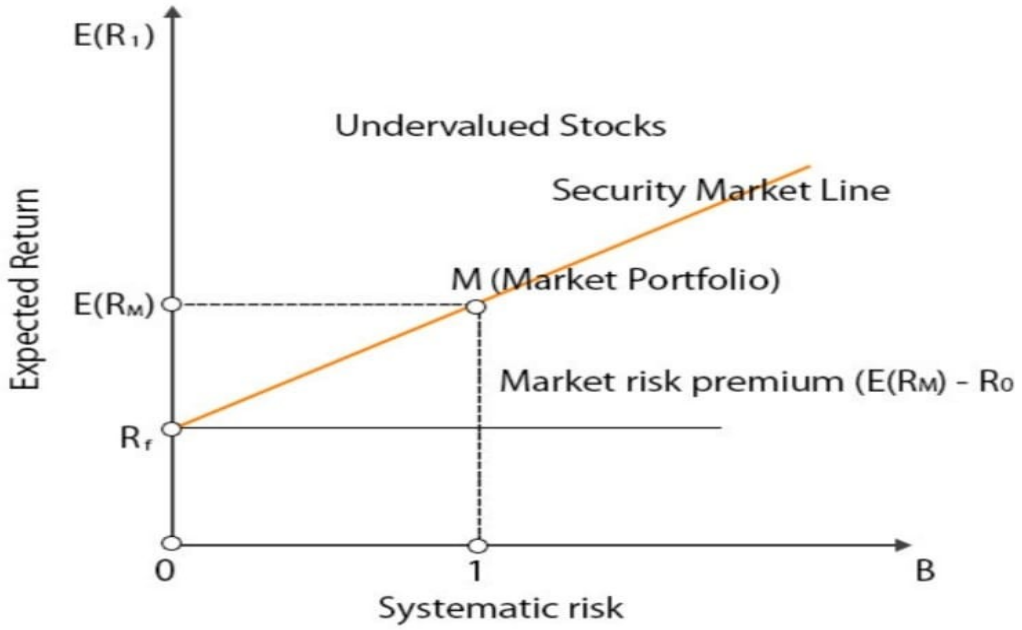

Figure3: Security Market Line

In portfolios involving complete diversification, where unsystematic risk tends to zero, systematic risk is measured by Beta(B).The only dimensions of a security which merit attention are expected returns and Beta. X axis represents risk of asset ,while Y axis represents expected returns from asset.

All portfolios of investments lie along a straight line in the return to beta space. This line can be determined by connecting the Intercept where Beta is zero, being risk-less security and market portfolio.(Beta of one and return of Rm).

The equation of that straight line is Security Market Line (SML)that connects the two parameters used to plot it, viz. risk and expected rewards is

$E(Ri)=Rf+ \beta i[E(Rm)-Rf]$,where

$E(Ri)$=Expected rate of return on security i

Rf=Risk free return

βi=Systematic risk(measure for non-diversifiable part of total risk)

$E(Rm)$= Expected return on market portfolio

$E(Rm)-Rf$=Excess return for extra risk

This is the vital relationship as it explains the expected return for all assets and portfolio of assets, efficient or not. The variation between expected return on any two assets can be attributed to their difference in Beta. Higher beta for any security indicates higher expected return, denoting the linear relationship between beta and expected return. Thus, this equation highlights the importance of systematic risk in delivering expected returns, thereby indicating that unsystematic risk is inconsequential.

Conversely, the CML, reflects the relationship between total risk and expected return. Total risk constitutes both systematic and unsystematic risks. The CAPM has two components of capital market return, viz. Reward for waiting for risk-less return and reward per unit of risk borne as measured by the slope of CML line.

However, SML considers only the systematic risk, which is market related and is not possible to reduce by diversification. Beta is the measure of risk of a security relative to the whole market and is used in SML. Beta measures the systematic/non-diversifiable risk, which arises from the market itself and is inherent to the stock. Beta of value 1 indicates that the stock is as risky as market. Beta value less than 1 depicts that the stock has less risk than market risk, while beta value greater than I indicates that stock has risk greater than the market risk. Beta =0 indicates that expected return is equal to risk free rate of return. The SML represents the opportunity cost of an investment .Assets above SML are considered to be undervalued as they offer a higher expected rate of return at a given level of risk. Conversely, assets below the SML are overvalued because their expected returns are lower for given risk level.

6.4.5: Applicability of CAPM

In the practical business world, investors get higher returns for higher risk and they are more concerned with company related risks than with market related risks, except in case of trained investment analysts. CAPM is widely used by companies to determine the cost of equity for the firm, to estimate the required return for divisions and to determine the hurdle rates for corporate investments and to measure the performance of investment with respect to costs and returns. This is especially useful for capital budgeting decisions.

In case of public utilities, the CAPM can be used to estimate rates to be charged to cover the costs. CAPM may be applied to select companies, construct portfolios and

assess the performance of portfolios as a tool for investment analysis. However, there are some limitations of this model. This model is unrealistic for any average investor, who follows fundamental analysis, involving company analysis: its earnings, dividends and bonus record.

CAPM theory does not conform to the real world risk- return trends. The assumption that the **market risk premium** (the difference between the expected market return and the risk-free rate) is constant may not hold in real life, especially in volatile markets or periods of economic uncertainty.

This model assumes that a stock's return is primarily driven by its systematic risk Beta and its exposure to the market, ignoring total risk. Estimating beta is tricky since it depends on historical data, and beta can change over time. A firm's beta might differ based on its sector, size, and operational risk.

6.4.5 Self-check exercise: Explain the efficient frontier with borrowing and lending.

6.5 SHARPE'S MODEL

Markowitz model had inherent limitations due to the challenges involved in compiling the expected returns, standard deviation, variance, covariance of each security to every other security in the portfolio. Sharpe model, proposed by William Sharpe has simplified this predicament by relating the return on a security to a single market index. This index reflects all well traded securities in the market and simplifies the work involved in compiling the elaborate matrices of variances as between individual securities.

If the market index is used for individual securities in the portfolio, the relation of any individual security with the market index can be represented in a Regression line as shown in Figure 4.

The x axis shows the excess return on the Market portfolio and y axis depicts the excess return on the security. The equation of regression characteristic line is

1.Basic Form of Sharpe model

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

Where:R_i=Return of stock

α_i=Alpha Coefficient(abnormal return)

β_i=Beta Coefficient (sensitivity to market)

R_m=Return of the market

E_i=Error term(residual)

2.Excess Return Form

$R_i-R_f=\alpha_i+\beta_i(R_m-R_f)+e_i$

Where: R_i-R_f=excess return of stock(return-risk free rate)

R_m-R_f=Excess return of the market index(market return-risk-free rate)

R_f=Risk-free rate of return

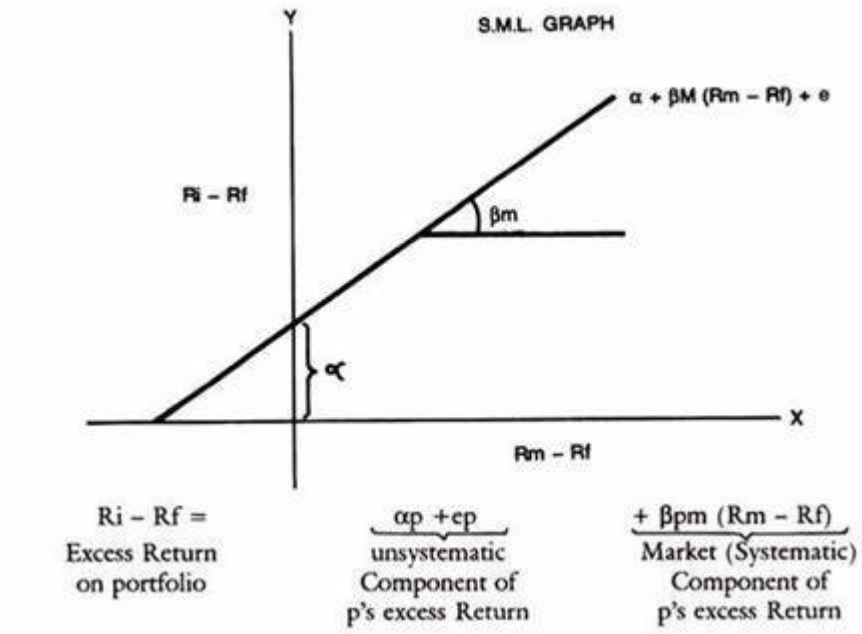

Figure4:Sharpe Model

α is the vertical intercept on Y axis representing the return on the security when only unsystematic risk is considered and systematic risk is measured by β .ei is the residual component ,not captured by the above variables.

Sharpe Ratio=$\frac{E[Ri-Rf]}{\sigma i}$

E=Expected Value

Ri=Return on Asset

Rf=Risk free

σi=Standard Deviation of the asset's excess return

If Sharpe Ratio is between 1 and 2,it is considered good as it is providing return commensurate with the given risk level. However, if the ratios are between 2 and 3, it is considered very good and if it is greater than three, then it is considered excellent.

6.5.1 Optimal Portfolio of Sharpe

The Optimal Portfolio of Sharpe is also known as Single Index Model. If Rj is the expected return on the stock j and Rf is the risk-free rate, then the excess return =Rj-Rf. This has to be adjusted to βj, viz. Rj-Rf/ βj, which is the equation for ranking stocks in the order of their return adjusted for risk. A cut-off rate has to be selected for including securities in a portfolio. For this, excess return to Beta ratio has to be calculated for each stock and ranked from highest to lowest. Then, only those securities, which have Rj-Rf/ βi greater than cut-off point, fixed in advance can be selected. The basis for finding the cut-off rate Cj, is as follows:

For a portfolio of I stock, Cj is the given cut-off rate

Calculating the Cut-off Rate C*

- For a portfolio of *i* stocks C_i is given by

$$C_i = \frac{\sigma_m^2 \sum_{j=1}^{i} \frac{(\bar{R}_j - R_F)\beta_j}{\sigma_{ej}^2}}{1 + \sigma_m^2 \sum_{j=1}^{i} \left(\frac{\beta_j^2}{\sigma_{ej}^2} \right)} \qquad \text{.....} \ldots (1)$$

- where σ_m^2 = the variance in the market index
- σ_{ej}^2 = unsystematic risk

6.6 Arbitrage Pricing Theory

Arbitrage is the simultaneous purchase and sale of the same or similar asset in different markets in order to profit from differences in the asset's listed price. It exploits short-lived variations in the price of identical or similar financial instruments in different markets or in diverse forms. Arbitrage exists as a result of market imperfections and it takes advantage of those inefficiencies and resolves them. CAPM, on the other hand, assumes that security's Beta is the singular parameter to measure risk. APT, however, recognises the various systematic factors that affect security returns.

This theory is an equilibrium model of asset pricing but assumes that the returns are generated by a factor model.

6.6.1Assumptions

1. The investors do not look at expected returns and standard deviations. Arbitrage brings the price of assets in different markets at the same level.
2. Investors prefer higher returns to lower returns.
3. APT is based on the return generated by factor models.
4. Risk-return analysis is not the basis of investment, rather, underlying factors ,such as economic growth, inflation, capital structure are all considered crucial in determining return on stocks.

This theory assumes that the price of an asset price today is the sum of discounted future cash flows, where the expected return of the asset is a linear function of the

various factors. It is based on the precept that arbitrage opportunities are non-existent.

The basic premise of the APT is that only a small number of systematic influences affect the long term average returns of securities. For this purpose, Multi-factor models are used, which allow an asset to have multiple measures of systematic risk. Each measure captures the sensitivity of the asset to the corresponding pervasive factor. If the factor model holds exactly and assets do not have specific risk, then the law of one price implies that the expected return of any asset is just a linear function of the other assets' expected return. If this was not the case, arbitrageurs would be able to create a long-short trading strategy to earn profits .

The return on risky asset is given by the following equation

$$E(rj) = rf + bj1RP1 + bj2RP2 + bj3RP3 + bj4RP4 + \ldots + bjnRPn$$

Where E(rj) is the expected return of the asset,

RPn the is risk premium of the factor,

rf is the risk-free rate and

bn is the sensitivity of the asset to factor *n*, also known as factor loading.

The factors include a gamut of economic and financial factors, fundamentals like price/earnings ratios, dividend yields, etc. Beta coefficients can be used to reflect the risk factors and factor sensitivities can also be considered to attain the expected returns.

Limitations of APT Model

The biggest challenge in APT is the identification of factors and bifurcating unanticipated and anticipated factors in the measurement of sensitivity. Beta measurement is subject to limitations, as they vary widely, with the number of years for which data are taken, the source of data and the methods of compilation being subject to normal statistical limitations.

6.6.2 Self-Check Exercise: Explain how Sharpe's model is an improvement over Markowitz model.

6.7 LET US SUM UP

Investors largely invest to generate returns on their capital. However, stock selection should not be based solely on the goal of maximizing returns. Risk plays a crucial role and must be considered before making investment decisions. Various portfolio

theories have been thoroughly explored. The Markowitz Model emphasizes that portfolio construction requires an understanding of both the individual risks and returns of securities, as well as the interrelationships between these risks. Sharpe's model, which streamlines portfolio analysis, was also discussed. Additionally, the APT and CAPM models offer valuable perspectives on the connection between security prices and equilibrium returns.

6.8 KEY WORDS

Arbitrage: Arbitrage is the simultaneous purchase and sale of the same or similar asset in different markets in order to profit from differences in the asset's listed price.

Beta: Non-diversifiable part of total risk or the Systematic risk.

Portfolio: A collection of assets.

Diversification: Allocating investments across different financial instruments, industries and categories to reduce risk and volatility.

6.9 TERMINAL QUESTIONS

I. Long questions

1. Explain the relationship of risk and returns in investment.
2. How does the Markowitz model help in planning an investor's portfolio?
3. Compare and contrast APT and CAPM models.
4. Explain the Sharpe Ratio in detail.
5. Compare and contrast Markowitz model and Sharpe model.
6. Explain the Arbitrage Pricing theory.
7. Explain the CAPM model.
8. Distinguish between CML and SML.
9. Distinguish between Systematic and Non-systematic risks.
10. Explain the efficient frontier when borrowing and lending take place.

6.10 SUGGESTED READINGS

Investment Analysis and Portfolio management -Prasanna Chandra-

Investment Management-VK Bhalla (S.Chand & Co.)

Security Analysis & Portfolio Management-V.A.Avadhani, Himalaya Publishing House.

Security Analysis & Portfolio Management-Fisher and Jordan, 6/e Pearson/PHI.

Short questions

1. Beta
2. Non-Systematic risk
3. Diversification
4. Systematic Vs. Non-systematic risks
5. Sharpe's Performance measure
6. Assumptions of Arbitrage theory
6. Limitations of CAPM

7. CAPM model
8. Efficient Frontier
9. Capital Market Line
10. Security Market Line

CERTIFICATE IN
STOCK MARKET AND TRADING OPERATIONS
GC-CST2: Basics of Security Analysis and Portfolio Management

UNIT VII – PORTFOLIO EVALUATION METHODS

STRUCTURE:

7.0 OBJECTIVES

After studying this unit, you would be able to:

- Understand the fundamentals of portfolio evaluation
- Define portfolio evaluation and explain its significance in assessing investment performance
- Identify and apply various portfolio evaluation methods
- Understand the concept and process of portfolio revision and rebalancing
- Explore the different asset allocation strategies
- Evaluate the concept of fixed income portfolios
- Assess the impact of different market conditions on portfolio performance

7.1 INTRODUCTION

In the current dynamic financial environment and rapidly changing markets, investors and portfolio managers have the difficult task of not only constructing portfolios that fit the investor's desires, but managing them in a manner that is fluid enough to be evaluated, revised and rebalanced based on changes in the market and changes in risk factors. Constructing a portfolio is much more than just choosing individual securities, but it necessitates a careful examination of statistics, comprehension of alternative investments, and the employment of structured techniques to determine

the success of investments. The goal of the above is to deeper understand the combination of concepts related to portfolio evaluation techniques, portfolio revision and rebalancing, asset allocation techniques, and construction of fixed income portfolios.

This journey starts with the discussion on the significance of portfolio evaluation. Although most people view portfolio evaluation as a measure of performance, it is actually a process that should include data as well as risk- adjusted performance and also factors, such as, the underlying process of an investment. The importance of knowing if one's portfolio is doing well as a tactical indicator of what to expect in performance from individual investments as well as what might not be working can't be over emphasized.

In a dynamic market, looking at how these strategies have performed historically is still an important part of the calculations – it can show us where such assumptions are failing or perhaps where they are working quite well, and can suggest to us what works or doesn't. The other central element of today's portfolio management is asset allocation. Diversification through asset allocation is the key to properly constructed portfolios that take into consideration risk and return for the client and it consists on allocating part of the client's money in different kinds of assets like equities, fixed income, real estate and alternative investments. When done well it leads to a reduced level of volatility for the total portfolio and, therefore, diversification benefits that will allow the portfolio to withstand market conditions or a recession. Investors can change their asset allocations to hedge, as risky investments in other types of assets such as oil and gas have seen speculative fever play out in market bubbles in the last decade.

7.2 CONCEPT OF PORTFOLIO EVALUATION

Portfolio evaluation consists of a thoough, and systematic process that includes evaluating the performance of a portfolio over time. It is the process of quantifying the effectiveness of a portfolio at fulfilling the financing goal for which it was created, and does this by weighing return versus risk. Portfolio evaluation, at the naivest stage, could be thought to depend on a simple calculation of the performance of the portfolio in a certain time. But one must look deeper to understand the fact that "an effective analysis cannot be all numerical; it needs to incorporate risk measures, the reference to the market, and more subjective issues to have a complete view of the investment strategy". It is a structured examination to determine how well a portfolio is meeting its financial objectives. This process quantifies the returns and the risks involved in the investments, but it is a process that is both numerical objective and qualitative subjective. This is not simply the process of counting up those that made

money, but also monitoring risk levels, gauging the return relative to appropriate benchmarks and determining the investment philosophy and management discipline at work. The following characteristics of portfolio evaluation may help you better to understand the concept:

7.2.1 Comprehensive performance management: Performance measure that accounts for total returns, incorporating profits, dividends, interest and capital gains, and looks at both total returns over time as well as annualized returns which enables the comparison on a consistent basis over different timeframes.

7.2.2 Risk analysis: It takes into account the risk and the degree of risk exposure, rather than raw return. This perspective is helpful in not only looking at high returns, but rather in balancing them against possible losses.

7.2.3 Risk-adjusted metrics: Utilizes measures which account for performance relative to the risk taken; this is necessary in order to accurately measure the efficacy of a portfolio rather than simply the gains produced.

7.2.4 Benchmarking: it compares the portfolio to an appropriate market index or peer group. This tells us whether performance is a product of managerial ability or is a function of the state of the market.

7.2.5 Qualitative insights: Evaluates the investment philosophy, strategy and discipline of the portfolio manager. It looks at whether the strategy continues to be consistent with the long-term objective of the investor and it concerns market sentiment shifts.

7.2.6 Continuous review and adaptation: Recognizes that portfolio evaluation is an ongoing process. Regular monitoring and flexibility are essential to adjust strategies when market conditions or personal circumstances change.

7.2.7 Holistic approach: Combines numerical data with judgmental insight. This blend allows investors to make informed decisions on whether to hold, change, or divest certain assets based on both the quantitative performance measures and qualitative factors.

It may be concluded that the portfolio evaluation provides strength to investors in addressing their success and failures. It helps begin to develop a routine-based trust of past performance to inform that type of investment in the future, and promote sound risk management as well. But, regardless of whether you are an individual investor or institutional portfolio manager, the vast importance of having an understanding of the underlying concept behind portfolio evaluation is evident as it serves as the foundation for making investment decisions that are strategically sound and aligned with long–term objectives.

7.3 METHODS OF PORTFOLIO EVALUATION

There are many different ways of measuring the performance of a portfolio, which, in

fact, can give very useful information on particular aspects of the investment performance. Some of the methods are discussed below:

7.3.1 Absolute return analysis: The most basic form of portfolio analysis is through absolute returns. It calculates the accumulated performance of the portfolio up to a particular time. Total return is computed by adding capital gains, dividends and interest income from the period and finding out what percentage it is of the beginning investment. These results are often stated in terms of annual returns so they can be compared on an equal footing across time frames. But, absolute returns, while clear and straightforward because they measure the pure performance of the fund; lack this context, that is, one cannot understand how much risk was taken to get the returns.

7.3.2 Risk–adjusted performance: Performance metrics can be adjusted by the level of risk assumed to provide a more accurate assessment of performance which is the level of return a product is delivering based on the level of risk that had to be taken to obtain such return. The Sharpe ratio is perhaps the most commonly used. Specifically, Sharpe ratio simply consists in subtracting the risk-free rate from the return of the portfolio and dividing the resulting difference by the standard deviation of the returns. This allows investors to understand if the return that they are receiving for the volatility that they are accepting, is a reasonable tradeoff. The greater this ratio the larger the return in relation to the risk that was undertaken, and that is something most portfolio managers pursued. Another significant ratio called the Treynor ratio, which relies on beta, can also be used in this case.

7.3.3 Benchmark comparison: Benchmark comparison looks into how a portfolio has performed relative to a relevant index or peer group. These benchmarks are often published and popular indices such as the S&P 500, or more tailored indices that are chosen by the manager to closely resemble the asset allocation or style of investments in the portfolio.

7.3.4 Attribution analysis: An attribution analysis disaggregates the return on the portfolio to identify how much return comes from each contributing factor, such as asset allocation, security selection, and timing effects. Disaggregating these elements allows one to help determine what is driving the performance of a portfolio in relation to each category.

7.3.5 Statistical and econometric models: To analyze portfolios quantitatively, it is common for investors to use statistical and econometric models. Most often, regression analysis is employed to link portfolio returns to market returns and other risk factors. The technique gives a statistical way to analyze how the portfolio is responsive to a certain type of systematic risk, providing a tool to later evaluate performance. Sophisticated models including Monte Carlo simulations provide a probability distribution of possible events based on past data and estimated volatilities. These simulations assist investors to analyze the likelihood of “black swan” probabilities, and probability of reaching desired return thresholds. This

randomness and variability allow statistical models to provide a probabilistic perspective on the nature of future performance and risk.

7.3.6 Qualitative assessment: Whereas quantitative analysis, while providing clear numeric values that are characteristic of performance, qualitative analysis completes the evaluation process and is aimed at reviewing the process of portfolio management. This may include examining investment process and philosophy, and consistency of process with goals and stated objectives.

In practice, generally one method of evaluation may not portray a clear picture, therefore most investors use some combination of the above techniques to fit into a broader process of evaluation.

7.4 PORTFOLIO REVISION AND REBALANCING

Portfolio revision and rebalancing involve the regular review and adjustment of a portfolio to keep it aligned with an investor's long-term objectives. As market conditions change, asset values shift, potentially causing the portfolio to deviate from its intended allocation. Revision is the process of assessing performance, risk exposure, and structural changes, while rebalancing is the corrective steps adjusting asset proportions back to target levels. This ensures the portfolio remains strategically focused and manages risk effectively. Regularly updating and adjusting a portfolio are important aspects of successful portfolio management in order to maintain a portfolio's focus on an investor's long-term objectives since portfolios have a tendency to move off-target due to market conditions. Over time the market performance and the economic conditions make the asset values vary, and thus the original asset allocation can vary from the intended portfolio mix. The regular process of reviewing and analysing performance metrics, risk exposures and overall structure of the portfolio are called revisions while, rebalancing is the actual process of adjusting the portfolio's holdings back to the intended or desired target allocation.

The reasons for portfolio change are due to the variability inherent in the financial markets. Even if a portfolio is diversified initially, it may "drift" toward over- or underweighting any particular asset as some components outperform or underperform others. This might happen for example during a very long equity bull market, when the percentage that the equity portion has intended to represent in the portfolio becomes much higher, raising unneeded levels of risk. This continuous revision also allows investors to observe changes in important statistics, for instance volatility, beta, drawdowns, etc., and to understand whether the portfolio is going far away from its optimal risk return profile. So, the revising is that introspective analysis that occurs before the balance is altered again. Regular portfolio revision and rebalancing helps the investors in following:

- **Maintaining strategic focus:** Regular updates keep the portfolio aligned with long-term financial goals despite market fluctuations.
- **Managing risk exposure:** Rebalancing mitigates excessive exposure by adjusting over- or under-weighted assets, preventing undue risk from concentrated positions.
- **Performance attribution and insight:** By reviewing performance metrics and risk measures, investors gain insight into which assets are contributing to or detracting from returns, guiding future allocation decisions.
- **Flexibility and responsiveness:** Dynamic rebalancing permits adjustments in anticipation of market changes, allowing for proactive corrections during periods of heightened volatility or economic shifts.

By consistently revising and rebalancing a portfolio, investors maintain control over their risk-return profile and position themselves to benefit from market fluctuations over the long term.

CHECK YOUR PROGRESS

I. Portfolio evaluation is best described as the process of:
   a) Counting profitable positions only
   b) Measuring returns without risk considerations
   c) Quantifying performance by weighing returns against risk and benchmarks
   d) Selecting individual securities

II. Benchmark comparison involves:
   a) Comparing portfolio returns to a relevant market index
   b) Measuring only absolute returns
   c) Evaluating qualitative strategy consistency
   d) Ignoring peer performance

III. Attribution analysis disaggregates portfolio return into contributions from:
   a) Interest and dividends only
   b) Asset allocation, security selection, and timing effects
   c) Risk-free and risky assets
   d) Market and non-market factors

IV. Monte Carlo simulation in portfolio evaluation provides:
   a) A single guaranteed return outcome
   b) Historical return averages only
   c) A probability distribution of possible future returns based on volatility estimates
   d) Exact predictions of market crashes

V. A qualitative assessment in evaluation examines:
   a) Only numeric performance metrics
   b) Investment philosophy, process consistency, and manager discipline
   c) The number of trades per period

d) Asset weighting alone

VI. Portfolio revision differs from rebalancing in that revision:

a) Adjusts back to target weights
b) Is the analytical review of performance and risk before changes
c) Is executed only at year-end
d) Never considers market changes

VII. Rebalancing a portfolio means:

a) Selling all winners and buying all losers indiscriminately
b) Restoring asset weights to their target allocations
c) Adding new asset classes without analysis
d) Ignoring original strategy

7.5 ASSET ALLOCATION STRATEGIES

Asset allocation is the basis of portfolio building and management. It is process that looks to allocate investments into many different types of assets which could include equity, fixed income, real assets, and alternative investments, and then improve the risk return perspective. The real mean of asset allocation is always to have a diversified portfolio. Investors can spread their investments across different asset classes that do not move perfectly in sync with return on investment and therefore reduce the overall volatility of the portfolio and in turn enhance the potential of higher returns with less variability. This mix is designed to balance risk and returns according to an investor's specific financial goals, risk tolerance, and investment timeline. Below are some of the important asset strategies used in this regard:

7.5.1 Strategic Asset Allocation: This strategy establishes a long-term target mix of asset classes that an investor adheres to over time. The idea is to define a baseline portfolio based on an individual's risk tolerance, investment objectives, and time horizon. For example, a moderate-risk investor might decide on a mix of 60% equities and 40% bonds. This allocation serves as a reference point for the initial portfolio construction and is maintained through periodic rebalancing to return to the target mix whenever market movements cause variations. Strategic asset allocation is less about short-term market conditions and more about a disciplined, long-term approach to achieving steady returns while managing risk.

7.5.2 Tactical Asset Allocation: Tactical asset allocation introduces flexibility into an otherwise fixed strategic plan. While the core allocation remains in place, this approach allows the investor to temporarily deviate from the target mix based on current market trends, economic indicators, or short-term opportunities. For instance, if a certain asset class appears poised for strong returns in the near term, an investor might increase its weight in the portfolio. Conversely, if an asset class is expected to underperform, its share might be temporarily decreased. Although taking advantage

of market timing can potentially enhance portfolio performance, it also brings additional risks and demands constant monitoring. This strategy is best suited for investors who are comfortable with short-term volatility and have a deep understanding of market dynamics.

7.5.3 Dynamic Asset Allocation: Distinct from the more static nature of strategic asset allocation, dynamic asset allocation constantly adjusts asset weights based on changes in market conditions and evolving risk factors. It relies heavily on up-to-date market data and quantitative models to determine the ideal balance between various asset classes at any given time. By shifting allocations in real time, dynamic asset allocation aims to not only capture growth opportunities during favorable market conditions but also to protect the portfolio's capital during downturns by moving into less risky assets. Although this strategy can offer enhanced protection and growth potential, its sophisticated nature requires robust analytical tools and expertise to implement effectively.

7.5.4 Risk Parity Allocation: Risk parity takes a unique approach by focusing on balancing the risk contributions from each asset class rather than allocating capital equally among them. Under this strategy, the portfolio is constructed so that each asset class contributes an equivalent amount of risk to the overall portfolio. In practice, this often results in a higher weighting toward lower-risk assets like bonds compared to higher-risk equities. The goal is to achieve a smoother overall risk profile for the portfolio, especially during times of market stress. Risk parity can help in managing portfolio volatility and ensure that no single asset class disproportionately influences the portfolio's performance.

7.5.5 Life Cycle (Glide Path) Allocation: This strategy adjusts the asset mix over time to reflect changes in an investor's financial situation and life stage. Younger investors, with a longer time horizon, typically adopt a more aggressive allocation with a higher proportion of equities to maximize growth potential over time. As the investor ages or approaches retirement, the strategy gradually shifts the portfolio toward more conservative assets, such as bonds and income-generating securities, to preserve capital and reduce risk. Often implemented through target-date funds or preset glide paths, life cycle allocation ensures the portfolio evolves in line with the changing risk appetite and income needs of the investor.

Together, these asset allocation strategies offer investors multiple approaches to balance risk and return. They provide a structured framework not only for building a diversified portfolio that can withstand market fluctuations but also for adapting investment choices dynamically as personal circumstances and market conditions change.

7.6 FIXED INCOME PORTFOLIO

A fixed income portfolio is built around debt-based securities designed to provide

regular, predictable income while preserving the capital. This type of portfolio is especially valuable during periods of stock market volatility as it offers a counterbalance to the unpredictability of equities. Fixed income securities include a wide range of instruments such as government bonds, corporate bonds, municipal bonds, mortgage-backed securities, and emerging market debt. Each instrument has its own risk-return characteristics influenced by factors like credit quality, duration, interest rate sensitivity, and liquidity.

In essence, a fixed income portfolio focuses on balancing yield with risk by carefully selecting securities that offer steady coupon payments and a promise of principal protection. Portfolio managers play a crucial role in monitoring key aspects such as duration—which measures how sensitive a bond's price is to interest rate changes—and credit quality, ensuring that the investments meet the desired income and safety levels. Additionally, liquidity considerations are vital since some fixed income instruments can become harder to sell in market downturns, potentially impacting the portfolio's flexibility.

Figure-1

Figure – 1 and the following key points can help you understand better the concept of fixed income portfolio:

7.6.1 Capital preservation and predictable income: The goal of a fixed income portfolio is capital preservation and reliable income, obtained through fixed interest or coupon payments. This characteristic will be appealing to conservative or retiree investors who look for consistent cash flow as opposed to high growth.

7.6.2 Diversified selection of investments: It focuses on investing in a variety of securities ranging from government or corporate bonds to municipal bonds or mortgage-backed securities. This diversity is good for diversification purposes because different types of assets have varying responses to changing economic landscapes.

7.6.3 Duration management: Managers can adjust their portfolio duration as a whole to determine the degree to which the value of the portfolio will fluctuate with interest rate variations. Short durations are indicative of less volatility in price movements; long durations are associated with higher yields also resulting in greater price sensitivity to interest rate changes.

7.6.4 Liquidity management: A well-constructed fixed income portfolio should contain a mixture of liquid and illiquid securities. It is this balance that will help to accommodate for future negative cash flow needs or market conditions without having to sell off assets at a disadvantageous price.

7.6.5 Yield enhancement opportunities: Convertible bonds, structured products, and emerging market debt may all begin to look attractive in a low-interest rate environment. These alternatives can generate higher returns, but have greater risks that should be carefully managed.

7.6.6 Risk mitigation and diversification: Due to their low exposure to equities, fixed income investments can also help to dampen the overall volatility in a portfolio. With bonds, investors can protect themselves from market volatility, from the ebbs and flows of the stock market surround, and instead be in more or less the same financial position over time.

CHECK YOUR PROGRESS

I. A higher Sharpe ratio indicates more return per unit of risk. **(True/ False)**
II. Benchmark comparison ignores peer-group performance. **(True/ False)**
III. Qualitative assessment reviews the manager's investment philosophy. **(True/ False)**
IV. Portfolio revision is identical to portfolio rebalancing. **(True/ False)**
V. Rebalancing restores holdings to strategic targets. **(True/ False)**
VI. Strategic asset allocation changes frequently based on market trends. **(True/ False)**
VII. Tactical allocation allows short-term deviation from long-term targets. **(True/ False)**
VIII. Dynamic allocation uses real-time quantitative models. **(True/ False)**
IX. Risk parity equalizes capital allocation across assets. **(True/ False)**
X. Life cycle allocation becomes more conservative as investors age. **(True/ False)**
XI. Fixed income portfolios focus on predictable coupon income. **(True/ False)**

7.7 LET US SUM UP

Effective portfolio management rests on thorough evaluation, periodic revision, precise rebalancing, and well-planned asset allocation. Portfolios require continual monitoring and adjustment to align with an investor's risk tolerance and long-term goals, especially when economic, political, or financial shifts occur. Rebalancing—whether rigidly or using tolerance bands—enables investors to sell assets that have

risen and purchase those that have fallen, maintaining strategic allocations and managing risk. Asset allocation strategies, including strategic, tactical, dynamic, and risk parity approaches, serve as building blocks for diversification. They allow portfolios to adapt to varying market conditions and different stages of an investor's financial life cycle, increasing the potential for returns even in uncertain times. Additionally, a fixed income portfolio offers stability through debt instruments that deliver predictable returns, cushioning the volatility of equities. Ultimately, disciplined, continual reassessment, recalibration, and redeployment are essential for long-term, risk-adjusted performance.

7.8 KEYWORDS

Portfolio Evaluation Systematic process of assessing returns versus risk and investment process quality.

Benchmark Comparison Measuring portfolio performance against a relevant market index.

Attribution Analysis Disaggregating total return into allocation, selection, and timing effects.

Monte Carlo Simulation Generating probabilistic return outcomes using random sampling and volatility inputs.

Qualitative Assessment Reviewing investment philosophy, process consistency, and manager discipline.

Portfolio Revision Analytical review of performance, risk exposure, and structural changes before adjustments.

Rebalancing Adjusting holdings to restore original or strategic asset weights.

Risk Parity Allocating assets so each contributes equally to portfolio risk.

7.9 ANSWERS TO CHECK YOUR PROGRESS

Q. No.	Answer	Q. No.	Answer	Q. No.	Answer
I	**C**	VII	**B**	XIII	**False**
II	**A**	VIII	**True**	XIV	**True**
III	**B**	IX	**False**	XV	**True**
IV	**C**	X	**True**	XVI	**False**
V	**B**	XI	**False**	XVII	**True**

VI	**B**	XII	**True**	XVIII	**True**

7.10 TERMINAL QUESTIONS

- Explain the concept of portfolio evaluation and discuss its importance in the overall portfolio management process.
- Critically analyse various methods of portfolio evaluation along with the strengths and limitations of each method.
- Explain how benchmarks are selected and used to evaluate portfolio performance. Also highlight the implications of these comparisons for both risk management and performance improvement.
- Describe the key triggers and steps involved in revising a portfolio. Discuss how changes in market conditions and investment objectives can necessitate revisions and rebalancing in the portfolio.
- Analyse the concept of portfolio rebalancing and its importance in maintaining the desired asset allocation. Examine different rebalancing strategies also.
- Define asset allocation and distinguish between strategic, tactical, and dynamic asset allocation strategies.
- Explore how proper asset allocation contributes to portfolio diversification and risk management.
- Provide an in-depth analysis of fixed income portfolio management. Discuss the key characteristics of fixed income securities also.

7.11 SUGGESTED READINGS

- Desai and Joshi, Investment Management (Security Analysis and Portfolio Management), S. Chand Publications
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