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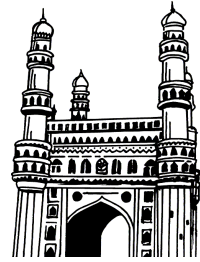
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JNTU (H) MBA

II Year III Semester

SECURITY ANALYSIS AND PORTFOLIO MANAGEMENT

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SECURITY ANALYSIS AND PORTFOLIO MANAGEMENT

STUDY MANUAL

SOLVED MODEL PAPERS

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SYLLABUS

UNIT - I

INTRODUCTION TO INVESTMENT:

Introduction, Indian Financial System and Structure, Investment, Speculation and Gambling, Features of Investment, Investment Avenues, Investment Process. The Investment Environment, Securities Market of India, Securities Trading and Settlement, Types of Orders, Margin Trading, Roles and Responsibilities of SEBI

UNIT - II

PORTFOLIO ANALYSIS:

Risk and Return Analysis, Markowitz Portfolio Theory, Mean – Variance Approach, Portfolio Selection, Efficient Portfolios, Single Index Model, Capital Asset Pricing Model, Arbitrage Pricing Theory.

UNIT - III

BOND VALUATION:

Classification of Fixed Income Securities, Types of Bonds, Interest Rates, Term Structure of Interest Rates, Measuring Bond Yields, Yield to Maturity, Yield to Call, Holding Period Return, Bond Pricing Theorems, Bond Duration, Modified Duration. Active and Passive Bond Management Strategies, Bond immunization, Bond Volatility, Bond Convexity.

UNIT - IV

EQUITY VALUATION:

(a) Intrinsic Value versus Market Value, Equity Valuation Models-Discounted Cash Flow Techniques, Dividend Discount Models (DDM), Growth Rate cases for DDM, Free Cash Flow Valuation Approaches, Relative Valuation Techniques, Earnings Multiplier Approach, Price/ Earnings, Price/ Book Value, Price/ Sales Ratio, EVA.

(b) Fundamental Analysis, Technical Analysis, Efficient Market Hypothesis.

UNIT - V

a) **Derivatives:** Overview of Indian Derivatives Markets, Option Markets, Option Strategies and Option Valuation, Forward & Future Markets, Mechanics of Trading,

b) **Performance Evaluation:** Mutual Funds, Types of Mutual Funds Schemes, Structure, Trends in Indian Mutual Funds, Net Asset Value, Risk and Return, Performance Evaluation Models: Sharpe Model, Treynor Model, Jensen Model, Fama's Decomposition.

Contents

UNIT - I

UNIT - II

UNIT - III

UNIT - IV

Frequently Asked & Important Questions

UNIT - I

1. What is financial system? What are the characteristics of good financial system?

Ans :   **(Imp.)**

Refer Unit-I, Page No. 2, Q.No. 3

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2. Write about Indian Financial system focusing on organized sector.

Ans :   **(Imp.)**

Refer Unit-I, Page No. 3, Q.No. 4

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3. Discuss the components of Indian financial system.

Ans :   **(Imp.)**

Refer Unit-I, Page No. 6, Q.No. 5

---

4. Differentiate between Investment and Speculation.

Ans :   **(April - 23, Dec.-19, Imp.)**

Refer Unit-I, Page No. 9, Q.No. 9

---

5. Describe briefly the various investment avenues available to the investors.

Ans :   **(July-24, April - 22, Imp.)**

Refer Unit-I, Page No. 11, Q.No. 12

---

6. What are the steps involved in the investment process?

Ans :   **(April - 23, Imp.)**

Refer Unit-I, Page No. 13, Q.No. 13

---

7. Write in detail the structure of primary and secondary securities market in India.

Ans :   **(Feb.-24, Aug.-21, Imp.)**

Refer Unit-I, Page No. 19, Q.No. 16

---

8. Briefly explain the Securities Institutions viz., NSE, SEBI and NSDI., which provide greater scope for Indian Stock Markets.

Ans :   **(Oct.-20, Dec.-19, Imp.)**

Refer Unit-I, Page No. 21, Q.No. 17

---

9. Give a detailed note on functions of SEBI.

Ans :   **(Feb.-24, Imp.)**

Refer Unit-I, Page No. 26, Q.No. 25

UNIT - II

1.   What is Beta and how can you measure risk through Beta?

Ans :   **(Dec.-19, Imp.)**

Refer Unit-II, Page No. 37, Q.No. 9

2.   The estimates of the standing deviation and correlation co-efficient for three stock are given below.

Stock	Standard deviation	Correlation with Stock		
		A	B	C
A	32	1.00	– 0.80	0.40
B	26	– 0.80	1.00	0.65
C	18	0.40	0.65	1.00

If a portfolio is constructed with 15% of stock A, 50% of stock B and 35% of stock C. What is the portfolios standard deviation ?

Ans :   **(May-19, Imp.)**

Refer Unit-II, Page No. 49, Prob. No. 4

3.   Discuss in detail about Mean Variance Approach.

Ans :   **(April-23, Imp.)**

Refer Unit-II, Page No. 56, Q.No. 11

4.   Explain single index model.

Ans :   **(April-23, May-19, Imp.)**

Refer Unit-II, Page No. 59, Q.No. 14

5.   What are the assumptions of CAPM Model ?

Ans :   **(July-24, Feb.-24, Nov.-20, Dec.-19, Dec.-18, Imp.)**

Refer Unit-II, Page No. 60, Q.No.15

6.   Briefly explain the Capital Market Line (CML) Concept, with the diagram and the formulae.

Ans :   **(Dec.-19, Imp.)**

Refer Unit-II, Page No. 61, Q.No. 16

7.   Discuss in detail the theory of Arbitrage Pricing.

Ans :   **(Nov.-20, Imp.)**

Refer Unit-II, Page No. 67, Q.No. 19

UNIT - III

1.   Describe the types of bonds.

Ans :   **(May-19, April-23, Imp.)**

Refer Unit-III, Page No. 80, Q.No. 4

2.   Explain the term structure of interest rates.

Ans :   **(Nov.-20, Imp.)**

Refer Unit-III, Page No. 82, Q.No. 7

3.   Explain in detail the various bond pricing theorems.

Ans :   **(Feb.-24, Dec.-18, Imp.)**

Refer Unit-III, Page No. 86, Q.No. 10

4.   What is Bond Duration ? How it is calculated.

Ans :   **(April-22, Dec.-19, Imp.)**

Refer Unit-III, Page No. 88, Q.No. 11

5.   Discuss elaborately active and passive bond management strategies.

Ans :   **(Nov.-20, Dec.-18, Imp.)**

Refer Unit-III, Page No. 91, Q.No. 14

6.   Briefly explain about bond volatility.

Ans :   **(July-24, April-23, Dec.-19, May-19, Imp.)**

Refer Unit-III, Page No. 93, Q.No. 16

7.   The face value of a bond is ₹ 1,000 coupon rate of 8% life of bond is 5 years and the market price of bond is ₹ 1,042. Compute YTM of this bond.

Sol :   **(April-22, Dec.-19, Imp.)**

Refer Unit-III, Page No. 96, Prob.No. 1

8.   A Reliance industries debenture with a face value of ₹ 100 has a coupon of 10% per annum coupon payment being made annually. The maturity date of the instrument is 7th May 2018. The traded price of the bond on 7th May 2016 is ₹ 110. Compute the yield to maturity of the bond.

Sol :   **(May-19, Imp.)**

Refer Unit-III, Page No. 97, Prob. No. 2

9.   **An investor wants to evaluate the following bond :**

Face value	Rs.100
Coupon value	12%
Maturity	3 years

(a)   **The investor wants a yield of 15%. What is the maximum price that the should pay for it?**

(b)   **If the bond is selling for Rs.95 rupees, what would be his yield?**

Sol :   **(April-23, Imp.)**

Refer Unit-III, Page No. 99, Prob.No. 5

UNIT - IV

1.   **What is equity valuation ? Explain the scope of equity valuation.**

Ans :   **(April-23, Dec.-19, Imp.)**

Refer Unit-IV, Page No. 115, Q.No. 1

2.   **Describe the equity valuation models.**

Ans :   **(April - 23, Dec.-19, Imp.)**

Refer Unit-IV, Page No. 117, Q.No. 4

3.   **What is free cash flow model? Discuss the procedure involved in it.**

Ans :   **(Feb.-24, April - 23, Dec.-19, Imp.)**

Refer Unit-IV, Page No. 119, Q.No. 6

4.   **Discuss briefly about P/E Ratio (or) Earnings Multiplier Approach.**

Ans :   **(July-24, April-23, Imp.)**

Refer Unit-IV, Page No. 125, Q.No. 8

5.   **A company paid dividends amounting to 0.75 per share during the last year. The company is expected to pay ₹ 2 per share during the next year. Investors forecast a dividend of ₹ 3 per share in the year after that. Therefore it is expected that dividends will grow at 10 percent per year into an indefinite future. Would you buy/sell the share if the current prices of the share is ₹ 54 ? Investors required rate of return is 15 percent.**

Sol :   **(May-19, Imp.)**

Refer Unit-IV, Page No. 129, Prob.No. 13

6.   **Define Fundamental Analysis. State the objectives of fundamental analysis.**

Ans :   **(July-24, Oct.20, Imp.)**

Refer Unit-IV, Page No. 132, Q.No. 12

7. **Describe the key economic variables that an investor must monitor as part of his fundamental analysis.**

Ans : (May-19, Imp.)

Refer Unit-IV, Page No. 134, Q.No. 14

8. **What are the advantages and limitations of technical analysis?**

Ans : (Aug.-21, Imp.)

Refer Unit-IV, Page No. 139, Q.No. 20

9. **What is the implication of semi-strong form market?**

Ans : (July-24, Feb.-24, Dec.-19, Dec.-18, Imp.)

Refer Unit-IV, Page No. 143, Q.No. 27

UNIT - V

1. **Discuss briefly about various option strategies.**

Ans : (Dec.-18, Imp.)

Refer Unit-V, Page No. 158, Q.No. 7

2. **Discuss the various methods of option valuation.**

Ans : (Dec.-18, Imp.)

Refer Unit-V, Page No. 163, Q.No. 8

3. **What are the assumptions of Black and Scholes option pricing model?**

Ans : (April-22, Dec.-19, Imp.)

Refer Unit-V, Page No. 163, Q.No. 9

4. **The spot price of a bond is Rs. 900 and one year future rate is Rs. 930. Interest payments of Rs. 40 are due after 6 months and after one year from today. The risk free rate of interest for 6 months and one year period are 9% and 10% respectively. Find out the profit of the investors. What should be his strategy if he holds one bond and the futures price is Rs. 905?**

Sol : (Aug.-21, Imp.)

Refer Unit-V, Page No. 173, Prob. No. 5

5. **The share of Omega Company which is not expected to pay dividend in the near future is currently selling for ₹ 150. The risk-free rate is 0.8 per a month. A 3-month futures contract is selling for ₹ 152. Develop an arbitrage strategy and show what your profit will be 6.3 months hence.**

Sol : (May-19, Imp.)

Refer Unit-V, Page No. 174, Prob. No. 6

6.   **Examine the types of mutual fund schemes.**

Ans :   **(April-23, May-19, Imp.)**

Refer Unit-V, Page No. 177, Q.No. 24

7.   **Briefly explain various models of performance evaluation.**

Ans :   **(Dec.-18, Imp.)**

Refer Unit-V, Page No. 184, Q.No. 31

8.   **Why does performance evaluation require an appropriate bench mark to be meaningful?**

Ans :   **(Aug.-21, Imp.)**

Refer Unit-V, Page No. 187, Q.No. 36

9.   **What do you understand by Systematic Investment Plan (SIP)? How does it benefit investors?**

Ans :   **(Aug.-21, Imp.)**

Refer Unit-V, Page No. 187, Q.No. 37

10.   **Given the following information.**

	Portfolio A	Portfolio B
Beta	0.9	1.8
Return (%)	12.5	19
SD (%)	20	26.5

Risk free rate of return 6% Market return = 12%

Calculate

(i)   **Sharpe Ratio**

(ii)   **Treynor Ratio**

Sol :   **(May-19, Imp.)**

Refer Unit-V, Page No. 189, Prob. No. 12

Introduction to Investment: Introduction, Indian Financial System and Structure, Investment, Speculation and Gambling, Features of Investment, Investment Avenues, Investment Process. The Investment Environment, Securities Market of India, Securities Trading and Settlement, Types of Orders, Margin Trading, Roles and Responsibilities of SEBI

1.1 INTRODUCTION TO INVESTMENT

Q1. Define investment. Explain the objectives of investment.

Ans :

Introduction

Investment is the employment of funds with the aim of achieving additional income or growth in value. The essential quality of an investment is that, it involves 'waiting' for a reward. It involves the commitment of resources which have been saved or put away from current consumption in the hope that some benefits will accrue in future. The term 'Investment' does not appear to be as simple as it has been defined. Investment has been categorized by financial experts and economists. It has also often been confused with the term speculation.

Meaning

Investment means "sacrificing the present value of money for future benefits".

In finance, Investment means the purchase of a financial product or other item of value with an expectation of favourable future returns. In general terms, investment means the use of money with the hope of making more money.

In business, producer purchase physical goods, such as durable equipment or inventory, in the hope of improving future business.

Definitions

(i) **According to Oxford Dictionary,** "Investment means the investing of money".

(ii) **According to an Individual Point of View,** "Investment refers to a money commitment of some sort. For example, a commitment of money to buy a new car is certainly an investment".

Objectives

The Objectives of Investment are given below:

1. **Maximize Current Income**

   This objective emphasizes on current yield over other factors. It is typical of people who must rely on investment income for part of their entire livelihood.

2. **Preservation of Capital**

   This is a common objective. In its purest form, it means that the dollar value of the portfolio should not fall. This is a rather rigorous form of this objective. However, in a more flexible form, it means investing so that the potential for declines in the overall value of the portfolio is within tolerable limits. In this form, it is a common and quite logical objective.

3. **Reasonable Current Income with Moderate Capital Growth**

   This modifies the first objective in that current investment income is not the only aim. While current income is important, capital gains also are sought.

4. **Long-Term Capital Growth**

   This objective aims primarily at capital gains over a relatively long period of time. It may be typical of investors who do not need current investment income to meet their living expenses. It implies a greater degree of risk in the portfolio.

5. **Aggressive Capital Growth**

   This objective seeks maximum capital growth and implies making riskier investments with considerable investment analysis and management.

6.   Tax-Advantages Investments

A person's top marginal income tax bracket may make tax-free or tax- sheltered investments attractive.

Q2.   Explain different types of Investment.

Ans :

A firm may include several different kinds of proposals in its capital budgeting process. There are many ways to classify investments.

(i)   Expansion and Diversification

A company can improve its existing production to expand existing operations. Enlargement of new business needs investment in new products and a new type of production activity inside the firm. Revenue expansion investments are those investments which are made in prevailing new products.

(ii)   Replacement and Modernization

The main purpose of modernization and replacement is to enhance the operating efficiency and reduce costs. Cost savings indicate increased profits but revenue of firm will remain unchanged. Asset s of the firm may become obsolete and outdated due to technological changes. The firm must replace outdated assets with new ones which operates more economically. Cost reduction investments are those replacement decisions which helps in initiating more efficient and economical assets in the firm. Although replacement decisions which consists of considerable modernization and technological development elaborate revenues and subsequently reduces costs.

There is another kind of classification of capital investment proposals which are as follows,

(a)   Independent investments

(b)   Contingent investments

(c)   Mutually exclusive investments.

(a)   Independent Investments

Independent investments meet the requirements of different proposals and do not strive with each other. Depending on the profitability of proposal and availability of funds, the company make investment decisions. The proposals which yield higher rate of return can be accepted and rest of them can be rejected.

(b)   Contingent Investments

These are the proposals whose acceptance depends on the acceptance of one or more other proposals. When "a contingent proposal is made, it should also contain the proposal on which it is dependent in order to have a better perspective of the situation.

(c)   Mutually Exclusive Investments

Mutually exclusive investments meet the requirements of same proposal and strive with one another. Two or more mutually exclusive proposals cannot be accepted because acceptance of one prevent the acceptance of other.

1.2 INDIAN FINANCIAL SYSTEM

Q3.   Define financial system. Discuss the characteristics of Indian financial system.

(OR)

What is financial system? What are the characteristics of good financial system?

Ans :   (Imp.)

Introduction

The economic growth of a nation is dependent on the way the saving that is generated in the economy is transferred to the investment, which gets converted to fruitful production process. This in turn, generates gross output in the economy. This becomes an important point in the measurement of the growth of the national economy.

This above method is known as the capital formation where, it goes through three distinct stages, i.e., Saving, Finance and Investment. Funds flow from the surplus saving to the deficit areas of the economy.

In order to enable capital formation, there is a requirement of intermediation or a system, which will create and channelize saving, leading to capital formation. The system, which does this function in the economy, is called the financial system.

Meaning

A financial system or financial sector functions as an intermediary and facilitates the flow of funds from the areas of surplus to the areas of deficit. A Financial System is a composition of various institutions, markets, regulations and laws, practices, money manager, analysts, transactions and claims and liabilities.

Definitions

(i) **According to Amit Chaudhary,** "Financial system is the integrated form of financial institutions, financial markets, financial securities, and financial services which aim is to circulate the funds in an economy for economic growth.

(ii) **According to Dhanilal,** "Financial system is the set of interrelated and interconnected components consisting of financial institutions, markets, and securities."

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│  ┌─────────────────┐    Flow of funds (savings)    ┌─────────────────┐    │
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│  │ (mainly business │    Flow of financial services  │ funds (mainly    │    │
│  │ firms and        │   ─────────────────────────►  │ households)      │    │
│  │ Government)      │    Incomes, and financial      │                 │    │
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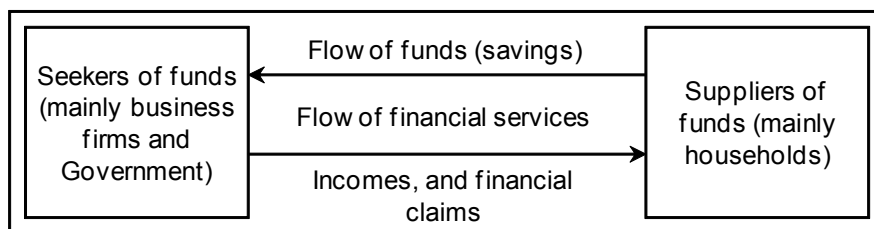
The word "system", in the term "financial system", implies a set of complex and closely connected or interlined institutions, agents, practices, markets, transactions, claims, and liabilities in the economy. The financial system is concerned about money, credit and finance-the three terms are intimately related yet are somewhat different from each other.

Characteristics

1.   Low Risk

The financial intermediation should ensure low risk for the supply of the funds in the economy. We all know that human beings are risk-averse and would prefer to work for lower risk, even if that means lower returns. However, if the financial intermediation provides only for low risk opportunities for the use of the fund, there will be very few takers of their services after some time, as the return will reduce. Hence, they should diversify the risk in as many financial instruments as possible, so that the fund provides have a balanced growth of their saving at the end of the process.

2.   Convenience

Financial intermediation should provide convenience for mobilizing saving to be converted into investment. Convenience, in this regard, means that the avenues to save should be such, that they are affordable (in small units), should involve less paperwork and should be very transparent in terms of legal contract. It should provide the maturity (payable) in the convenience of the person, who does the saving.

3.   Efficient Management

Financial intermediation should provide for an efficient management of funds which come to them. Efficient management means they should have expert investment system which understands the risk and return of the market, takes the decision in favour of the person who saves and ensures proper return of the money being used. The efficient system should also ensure that the intermediation makes best use of the fund available to them. One way to do that is to see that the economy of scale is achieved. Since they operate with a huge amount of money, they generally have the advantage of making the financial market move along their requirement optimally due to their size.

1.2.1 Structure

Q4.   Discuss the structure of Indian Financial System.

(OR)

Write about Indian Financial system focusing on financial services.

(OR)

Write about Indian Financial system focusing on organized sector.

Ans :   **(Imp.)**

The Indian financial system refers to the system of borrowing and lending of funds or the demand for and the supply of finance of all individuals, institutions, companies and of the government. The Indian financial system is broadly classified into two categories.

1.   Organized/formal financial system

2.   Unorganized/informal financial system.

The figure below gives a clear understanding about the structure of Indian financial system.
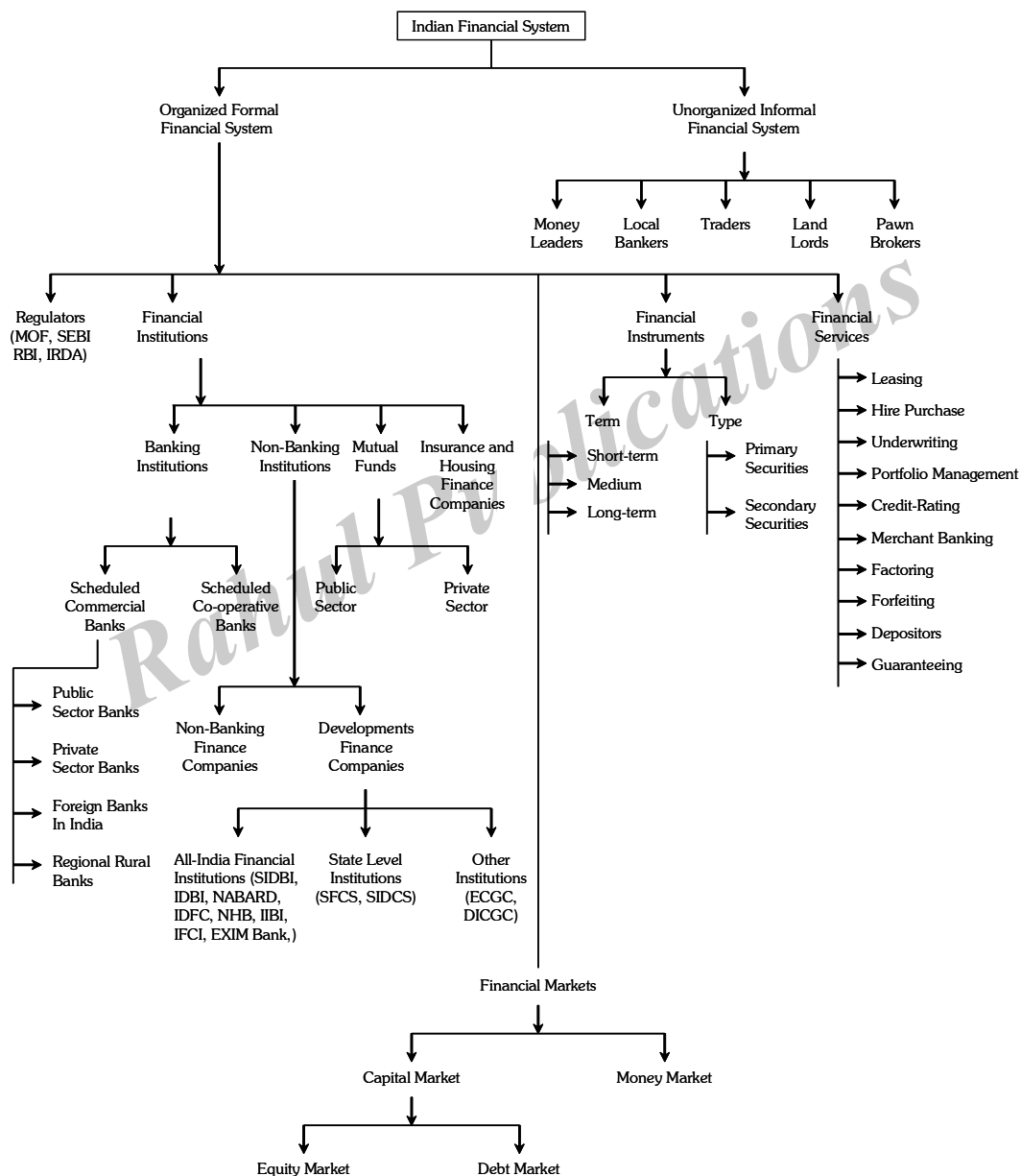

Fig.: Structure of the Indian Financial System

1.   Organized/Formal Financial System

The organized or the formal financial system consists of a network of banks, financial institutions, investment institutions and a range of financial instruments, that function in developed capital and money markets. Organized financial system comes under the responsibility of MOF-Ministry of Finance, RBI-Reserve Bank of India, SEBI-Securities and Exchange Board of India and some other regulatory bodies. The organized financial system is divided into four components. They are,

(i)   Financial Institutions

Financial institutions are intermediaries that mobilize savings and help in the allocation of funds in an appropriate way. Financial institutions are classified into four segments - Banking Institutions, non-banking Institutions and Investment Institutions like-mutual funds and housing finance companies. Financial institutions include,

(a)   Non-banking financial institutions like DFIs, NBFCs, FIFCs etc.

(b)   Term-finance institutions like IDBI, ICICI, IFCI, SIDBI and IIBI.

(c)   Specialized Financial Institutions like EXIM, TFCI, IDFC, NABARD, NHB.

(d)   Mutual Funds such as UTI.

(e)   Insurance Activities such as LIC, GIC.

(f)   State Level Financial Institutions such as SFCs and SIDCs.

(ii)   Financial Markets

These are intermediations where the general public or the business organization come together to get their fund requirement fulfilled. These may be primary market, where the givers and takers of fund meet for the first time and the secondary market, where the investment procured in the primary market are bought and sold. The financial markets are of two kinds, capital market and the money market. The capital market helps in raising the long term funds for business and the money market helps in raising short term finance for the business.

(iii)   Financial Instruments

Financial instruments refer to those documents which represent financial claims on assets. Financial asset refers to a claim to the repayment of a certain sum of money at the end of a specified period together with interest or dividend. Examples: Bill of exchange, Promissory Note, Treasury Bill, Government Bond, Deposit receipt, Share, Debenture, etc.

Financial instruments can also be called financial securities.

Financial securities can be classified into:

(i)   Primary (or) direct securities.

(ii)   Secondary (or) indirect securities.

(i)   Primary Securities

These are securities directly issued by the ultimate investors to the ultimate savers.

Example: Shares and debentures issued directly to the public.

(ii)   Secondary Securities

These are securities issued by some intermediaries called financial intermediaries to the ultimate savers.

Example: Unit Trust of India and mutual funds issue securities in the form of units to the public and the money pooled is invested in companies.

Again these securities may be classified on the basis of duration as follows:

(i)   Short-term securities

(ii)   Medium-term securities

(iii)   Long-term securities.

(i)   Short-term securities

Short-term securities are those which mature within a period of one year.

E.g., Bill of Exchange, Treasury bill, etc.

(ii)   Medium-term securities

Medium-term securities are those which have a maturity period ranging between one and five years. E.g., Debentures maturing within a period of 5 years.

(iii) Long-term securities

Long-term securities are those which have a maturity period of more than five years.

E.g., Government Bonds maturing after 10 years.

(iv) Financial Services

The term "Financial Services" in a broad sense means "mobilizing and allocating savings". Thus, it includes all activities involved in the transformation of saving into investment.

2. Unorganized/Informal Financial System

An unorganized financial system consists of money lenders, local bankers, traders, landlords, pawn brokers who are less controlled. Unorganized financial systems are not directly responsive to the Reserve Bank of India (RBI). The informal financial system is divided into,

(i)   Individual money lenders like Neighbours, Relatives, Traders, Landlords etc.

(ii)   Groups of individuals operating in a combined way as funds/associations are fixed fund, association, saving club etc.,

(iii)   Partnership firms including pawn brokers, non-financial institutions like chit-fund, finance and investment companies.

Q5.   Explain the various components of Indian financial system.

(OR)

Discuss the components of Indian financial system.   **(Imp.)**

Ans :

A financial system refers to a system which enables the transfer of money between investors and borrowers. A financial system could be defined at an international, regional or organizational level. The term "system" in "Financial System" indicates a group of complex and closely linked institutions, agents, procedures, markets, transactions, claims and liabilities within an economy.

There are five components of Financial System which is discussed below:

1.   Financial Institutions

It ensures smooth working of the financial system by making investors and borrowers meet. They mobilize the savings of investors either directly or indirectly via financial markets by making use of different financial instruments as well as in the process using the services of numerous financial services providers.

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                        ┌─────────────────────────────────────┐
                        │   Components of Financial System     │
                        └─────────────────────────────────────┘
                                        │
     ┌──────────────┬──────────────┬────┴─────────┬──────────────┬──────────────┐
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                    ├── (a) Money Market
                    ├── (b) Capital Market
                    ├── (c) Foreign Exchange Market
                    └── (d) Credit Market
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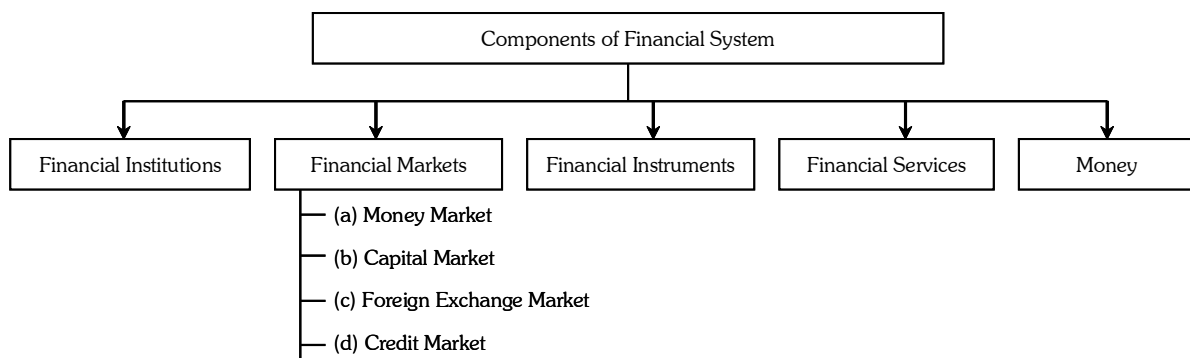
2. **Financial Markets**

A Financial Market can be defined as the market in which financial assets are created or transferred. As against a real transaction that involves exchange of money for real goods or services, a financial transaction involves creation or transfer of a financial asset. Financial Assets or Financial Instruments represent a claim to the payment of a sum of money sometime in the future and /or periodic payment in the form of interest or dividend. There are four components of financial market are given below:

(a) Money Market

The money market is a wholesale debt market for low-risk, highly-liquid, short-term instrument. Funds are available in this market for periods ranging from a single day up to a year. This market is dominated mostly by government, banks and financial institutions.

(b) Capital Market

The capital market is designed to finance the long-term investments. The transactions taking place in this market will be for periods over a year.

(c) Foreign Exchange Market

The Foreign Exchange market deals with the multicurrency requirements which are met by the exchange of currencies. Depending on the exchange rate that is applicable, the transfer of funds takes place in this market. This is one of the most developed and integrated markets across the globe.

(d) Credit Market

Credit market is a place where banks, Financial Institutions (FIs) and Non Bank Financial Institutions (NBFCs) purvey short, medium and long-term loans to corporate and individuals.

3. **Financial Instruments**

Financial instruments refer to those documents which represent financial claims on assets. Financial asset refers to a claim to the repayment of a certain sum of money at the end of a specified period together with interest or dividend. Examples: Bill of exchange, Promissory Note, Treasury Bill, Government Bond, Deposit receipt, Share, Debenture, etc.

4. **Financial Services**

It consists of services provided by Asset Management and Liability Management Companies. They help to get the required funds and also make sure that they are efficiently invested. They assist to determine the financing combination and extend their professional services up to the stage of servicing of lenders. They help with borrowing, selling and purchasing securities, lending and investing, making and allowing payments and settlements and taking care of risk exposures in financial markets. These range from the leasing companies, mutual fund houses, merchant bankers, portfolio managers, bill discounting and acceptance houses.

5. **Money**

It is understood to be anything that is accepted for payment of products and services or for the repayment of debt. It is a medium of exchange and acts as a store of value. It eases the exchange of different goods and services for money.

Q6.   **Compare and contrast Capital Market and Money Market.**

Ans :   (May - 19, Imp.)

S.No.	Nature	Capital market	Money market
1.	Participants	Individual investors as well as institutional investors like financial institutions, banks, corporate houses and foreign investors participate in the capital market transactions.	The participants are RBI, Commercial Banks financial institutions, mutual funds and corporate houses. Individual investors do not participate in money-market.
2.	Instruments traded	The instruments of capital market include equity shares, preference shares, bonds, debentures, etc. deposit, etc.	Some of the main instruments used in money-market are commercial paper, treasury bills, trade bills, certificate of
3.	Duration of securities traded	The capital market deals in medium and long-term securities which are for more than one year.	Money-market deals in short-term securities having a maximum tenure of one year.
4.	Expected return	Higher returns on investment. risk involved leads to lesser returns.	There is always a trade off between risk and return. Low
5.	Safety	Capital market is more risky. due to short duration and soundness of issuers.	The instruments of money-markets are safe, less risky

Q7.   **Explain the various money market instruments.**

Ans :   (May - 19, Imp.)

1.   **Call Money Market**

Call money market consists of overnight financing and money needed at short notice for periods upto 14 days. It is meant to balance the short-term needs of the banks. Call money markets exist in all developed money markets. In fact, it is the most sensitive part of the financial system. In India, the call money market is centered in Mumbai. Institutions like IDBI, GIC, NABARD participate in   the call money market.

2.   **Treasury Bill Market**

Treasury bill market is mainly concerned with the treasury bills. The treasury bills are referred as the short term liability of the central government in India. These bills are offered for settling the temporary deficits faced by the government.

3.   **Commercial Bill Market**

Commercial bills are the credit instruments which helps the business organizations and banking organizations. The commercial bill legally aims at repaying the seller in case of late payments by the purchaser. Usually, commercial bills emerge from local transactions.

4.   **Certificate of Deposits Market**

A certificate of deposit is a type of certificate given by the bank to its depositors for a particular time period. These certificates are same like conventional term deposits but with the only difference that they are to be negotiated and traded in short-term money market.

5.   **Commercial Paper (CP's)**

Commercial paper is a short-term instrument of raising funds by corporate. It is a sort of unsecured promissory note sold by the issuer to the investor. The maturity of the CPs is flexible. Highly rated corporate which can obtain funds at a cost lesser than the cost of borrowing from banks are particularly interested in issuing CPs.

1.3 SPECULATION AND GAMBLING

Q8. Define speculation. Explain the features and functions of speculation.

Ans :

Meaning

(i) Speculation has a special meaning when talking about money. The person who speculates is called a speculator. A speculator does not buy goods to own them, but to sell them later. The reason is that he wants to make profit from the changes of market prices.

(ii) Speculation is the buying, holding, and selling of stocks, commodities, currencies, collectibles, real estate, or any valuable thing to profit from fluctuations in its price as opposed to buying it for use or for income - dividends, rent etc.

(iii) Speculation is one of three market roles in western financial markets, distinct from hedging and arbitrage.

(iv) Speculation bears part of the uncertainty about future random changes of investment periods and increases the investor's independence on the time horizon of the other investors, of their time schedule for their investment or disinvestment in stock.

(v) The profits from speculation are the price that the non-speculative investors must pay to the speculators for their provision of additional trading of stocks.

Features

Following are the features of speculation:

(i) One tries to buy the goods when they are cheap and to sell them when they are expensive. There is a good chance to do that as long as the market price of a good changes often in different directions.

(ii) Speculation includes the buying, holding, selling, and short-selling of stocks, bonds, commodities, currencies, collectibles, real estate, derivatives, or any valuable financial instrument.

(iii) Speculation is one of the market roles in western financial markets. The others are hedging, long-term investing, and arbitrage.

(iv) Speculators do not plan to keep an asset for a long time.

Functions

(i) Smoothen operating of price fluctuation process.

(ii) It maintains temporary equilibrium between capital supply and demand.

(iii) Consideration of future business prospects in determining the business value of existing capital funds.

(iv) Equating the risk to return in the infinitely varied utilizations of the social capital fund.

Q9. Differentiate between Investment and Speculation.

Ans :   **(April - 23, Dec.-19, Imp.)**

The following are the important differences investment and speculation.

S.No	Nature	Investment	Speculation
1.	**Meaning**	The investing of money	A message expressing an opinion based on incomplete evidence.
2.	**Types of Contract**	Investor is a creditor of the investment	Speculator is an owner of the speculation.
3.	**Length Commitment**	In the case of investment the length of commitment is a long-term.	In the case speculation the length of commitment is a short term only.
4.	**Source of Income**	The source of income is earning from the enterprise.	The source of income is fluctuated and changes in market price.
5.	**Quantity of Risk**	Quantity of risk is the low.	Quantity of risk is the high
6.	**Stability of Income**	Income is very stable.	Income is uncertain and erratic.
7.	**Psychological Attitude of Participants**	Investor's psychological attitude is a cautions and conservative.	Speculator psychological attitude is a daring and careless.
8.	**Reasons for Purchase**	It is scientific analysis of intrinsic worth.	It is unscientific analysis of intrinsic worth.

Q10. Compare and contrast investment and gambling.

Ans :

S.No.	Nature	Investment	Gambling
1.	**Creation of Risk**	In the case investment. the investors deal with pre-existing risk.	Here gambler creates risk.
2.	**Transfer of Risk**	Transferring the risk from investors to insurance companies.	In the case of gambling, transferring or shifting the risks are not possible.
3.	**Expected Return**	Investing has a positive expected return.	Gambling has a negative expected return.
4.	**Measure of Risk**	The risk and uncertainty are measurable in the return on any investment.	The risk and uncertainly cannot be measured because of the high degree of uncertainty.
5.	**Activity**	Investing is a productive activity that provides benefits to the society.	Gambling is an unproductive activity that harms the society.
6.	**Length of Proposals**	It implies long-term proposals, greater is the risk and expects long-term rate of return.	It implies short-term proposals, high risk and greater uncertainty, and expectation of high return.

1.4 FEATURES OF INVESTMENT

Q11. Explain the characteristics features of investment.

Ans :

Following are the various characteristics of investment,

1.   Risk

Risk of an investment refers to the variability of its rate of return. The greater the variability or dispersion of the possible outcomes or the broader the range of possible outcomes, the greater is the risk.

Total risk of a security equals = Unsystematic risk + Systematic risk

Standard Deviation is used to measure unsystematic risk. Unsystematic risk is specific to the company and is reduced by diversification. Beta is used to measure systematic risk or Non-diversifiable risk that emanates or emerges from uncontrollable forces and is therefore not unique to the stock.

2.   Marketability

An investment is highly marketable or liquid if :

i)   It can be transacted quickly.

ii)   The transaction cost is low.

iii) The price change between two successive transactions is negligible.

High marketability is desirable characteristics and low marketability is an undesirability of any company.

3.   Tax Shelter

Some investments provide tax benefits, others do not. Tax benefits are of following three kinds :

i)   Initial Tax Benefit

It refers to the tax relief enjoyed at the time of making the investment.

ii)   Continuing Tax Benefits

Tax shield associated with the periodic returns from the investment.

iii) Terminal Tax Benefit

It refers to relief from taxation when an investment is realized or liquidated.

4.   Convenience

Convenience broadly refers to the ease with which the investment can be made and looked after. Degree of convenience associated with investments varies widely. At one end of spectrum is the deposit in a saving bank account that can be made readily and that does not require any

maintenance effort. At the other end of the spectrum is purchase of a property that may involve a lot of procedural and legal hassles at the time of acquisition and a great deal of maintenance effort.

5.   Concealability

It is another essential characteristic of the investment. Concealability means investment to be safe from social disorders, government confiscations or unacceptable levels of taxation, property must be concealable and leave no record of income received from its use or sale. Gold and precious stones have long been esteemed for these purposes, because they combine high value with small bulk and are readily transferable.

6.   Capital Growth

It refers to appreciation of investment. Capital growth has today become an important character of investment. It is recognizing in connection between corporation and industry growth and very large capital growth. Investors and their advisers are constantly seeking 'growth stock' in the right industry and bought at the right time.

7.   Purchasing Power Stability

It refers to the buying capacity of investment in market. Purchasing power stability has become one of the import traits of investment. Investment always involves the commitment of current funds with the objective of receiving greater amounts of future funds.

8.   Stability of Income

It refers to constant return from an investment Another major characteristic feature of the investment is the stability of income. Stability of income must look for different path just as security of principal. Every investor always considers stability of monetary income and stability of purchasing power of income.

1.5 INVESTMENT AVENUES / INVESTMENT ALTERNATIVES

Q12. Discuss briefly the wide array of investment avenues.

(OR)

Describe briefly the various investment avenues available to the investors.

Ans :   **(April - 22, Imp.)**

There are number of investment avenues available for investors

1.   Government Savings Schemes

Government of India offers a number of small savings schemes to individual investors. These schemes are offered through the post office and select banks. The important savings schemes are:

➢   Public Provident Fund

➢   Senior Citizens' Saving Scheme

➢   National Savings Certificate

2.   Money Market Instruments

Debt instruments which have a maturity of less than one year at the time of issue are called money market instruments - these instruments are highly liquid and have negligible risk. The major money market instruments are:

➢   Treasury bills

➢   Certificates of deposit

➢   Commercial paper

➢   Repos

3.   Bonds (or) Debentures

Bonds or debentures represent long-term debt instruments. The issuer of a bond promises to pay a stipulated stream of cash flow. Bonds may be classified into the following categories:

➢   Government securities

➢   PSU bonds

➢   Debentures of private sector companies

➢   Preference shares

4.   Equity Shares

Equity shares represent ownership capital. As an equity shareholder, you have an ownership stake in the company. This essentially means that you have a residual interest in income and wealth. Perhaps the most romantic among various investment avenues, equity shares are classified into the following broad categories by stock market analysts:

➢   Blue chip shares

➢   Growth shares

➢   Income shares

➢   Cyclical shares

➢   Speculative shares

5.   Mutual Funds

Mutual Funds instead of directly buying equity shares and / or fixed income instruments, you can participate in various schemes floated by mutual funds which, in turn, invest in equity shares and fixed income securities. There are three broad types of mutual fund schemes:

➢   Equity schemes

➢   Debt schemes

➢   Balanced schemes

6.   Life Insurance

Life Insurance In a broad sense, life insurance may be viewed as an investment. Insurance premiums represent the sacrifice and the assured sum, the benefit. The important types of insurance policies in India are:

➢   Endowment assurance policy

➢   Money back policy

➢   Whole life policy

➢   Term assurance policy

Retirement Products The important retirement products are:

➢   Employees' Provident Fund (EPF) Scheme, 1952

➢   Employees' Pension Scheme (EPS), 1952

➢   National Pension Scheme, 2004

➢   Pension schemes of insurance companies and mutual funds

7.   Real Estate

Real Estate for the bulk of the investors the most important asset in their portfolio is a residential house. In addition to a residential house, the more affluent investors are likely to be interested in the following types of real estate:

➢   Agricultural land

➢   Semi-urban land

➢   Commercial property

➢ A resort home

➢ A second house

8   Precious Objects

Precious objects are items that are generally small in size but highly valuable in monetary terms. The important precious objects are:

➢ Gold and silver

➢ Precious stones

➢ Art objects

9   Financial Derivatives

A financial derivative is an instrument whose value is derived from the value of an underlying asset. It may be viewed as a side bet on the asset. The most important financial derivatives from the point of view of investors are:

➢ Options

➢ Futures

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1.6 INVESTMENT PROCESS

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Q13. What are the steps involved in the investment process?

Ans :   **(April - 23, Imp.)**

The investment process involves a series of activities leading to the purchase of securities or other investment alternatives. The investment process can be divided into five stages

(I)   Investment policy

(II)   Analysis

(III) Valuation

(IV) Construction of Portfolio

(V)   Evaluation.

The flowchart explains the stages and factors connected there of,
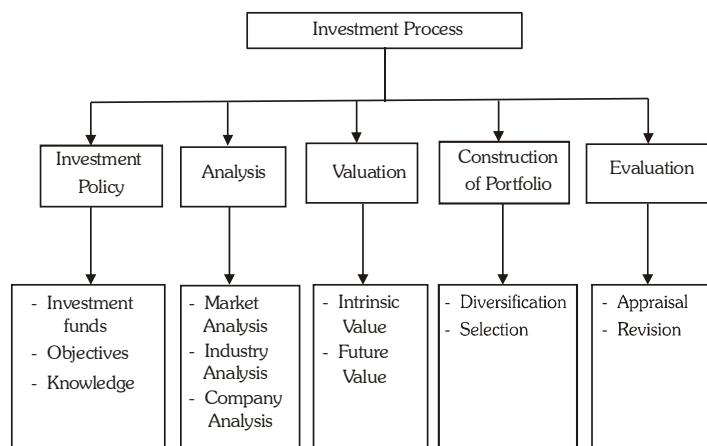

Fig.: Process of investment

I) Investment Policy

The government or the investor before proceeding into investment formulates the policy for the systematic functioning. The essential ingredients of the policy are the investible funds, objectives and the knowledge about the investment alternatives and market.

(a) Investible funds

The entire investment procedure revolves around the availability of investible funds. The fund may be generated through savings or from borrowings. If the funds are borrowed, the investor has to be extra careful in the selection of investment alternatives. The return should be higher than the interest he pays. Mutual funds invest their owners' money in securities.

(b) Objectives

The objectives are framed on the premises of the required rate of return, need for regularity of income, risk perception and the need for liquidity. The risk taker's objective is to earn high rate of return in the form of capital appreciation, whereas the primary objective of the risk averse is the safety of the principal.

(c) Knowledge

The knowledge about the investment alternatives and markets plays a key role in the policy formulation. The investment alternatives range from security to real estate. The risk and return associated with investment alternatives differ from each other. Investment in equity is high yielding but has more risk than the fixed income securities. The tax sheltered schemes offer tax benefits to the investors.

II) Security Analysis

After formulating the investment policy, the securities to be bought have to be scrutinised through the market, industry and company analysis.

(a) Market Analysis

The stock market mirrors the general economic scenario. The growth in gross domes-tic product and inflation are reflected in the stock prices. The recession in the economy results in a bear market. The stock prices may be fluctuating in the short run but in the long run they move in trends i.e. either upwards or downwards. The investor can fix his entry and exit points through technical analysis.

(b) Industry Analysis

The industries that contribute to the output of the major segments of the economy vary in their growth rates and their overall contribution to economic activity. Some industries grow faster than the GDP and are expected to continue in their growth. For example the information technology industry has experienced higher growth rate than the GDP in 1998. The economic significance and the growth potential of the industry have to be analyzed.

(c) Company Analysis

The purpose of company analysis is to help the investors to make better decisions. The company's earnings, profitability, operating efficiency, capital structure and management have to be screened. These factors have direct bearing on the stock prices and the return of the investors. Appreciation of the stock value is a function of the performance of the company. Company with high product market share is able to create wealth to the investors in the form of capital appreciation.

III) Valuation

The valuation helps the investor to determine the return and risk expected from an investment in the common stock.

(a) Intrinsic Value

The intrinsic value of the share is measured through the book value of the share and price earning ratio. Simple discounting models also can be adopted to value the shares. The stock market analysts have developed many advanced models to value the shares. The real worth of the share is compared with the market price and then the investment decisions are made.

(b) Future Value

Future value of the securities could be estimated by using a simple statistical technique like trend analysis. The analysis of the historical behaviour of the price enables the investor to predict the future value.

IV) Construction of Portfolio

A portfolio is a combination of securities. The portfolio is constructed in such a manner to meet the investor's goals and objectives The investor should decide how best to reach the goals with the securities available. The investor tries to attain maximum return with minimum risk. Towards this end he diversifies his portfolio and allocates funds among the securities.

(a) Diversification

The main objective of diversification is the reduction of risk in the loss of capital and income. A diversified portfolio is comparatively less risky than holding a single portfolio. There are several ways to diversify the portfolio.

➢ **Debt and equity diversification**

Debt instruments provide assured return with limited capital appreciation. Common stocks provide income and capital gain but with the flavour of uncertainty. Both debt instruments and equity are combined to complement each other.

➢ **Company diversification**

Securities from different companies are purchased to reduce risk. Technical analysts suggest the investors to buy securities based on the price movement. Fundamental analysts suggest the selection of financially sound and investor friendly companies.

(b) Selection

Based on the diversification level, industry and company analyses the securities have to be selected. Funds are allocated for the selected securities. Selection of securities and the allocation of funds and seals the construction of portfolio.

V) Evaluation

The portfolio has to be managed efficiently. The efficient management calls for evaluation of the portfolio. This process consists of portfolio appraisal and revision.

(a) Appraisal

The return and risk performance of the security vary from time to time. The variability in returns of the securities is measured and compared. The developments in the economy, industry and relevant companies from which the stocks are bought have to be appraised. The appraisal warns the loss and steps can be taken to avoid such losses.

(b) Revision

Revision depends on the results of the appraisal. The low yielding securities with high risk are replaced with high yielding securities with low risk factor. To keep file return at a particular level necessitates the investor to revise the components of the portfolio periodically.

Q14. What are the factors to be considered by an investor before making investment decision?

Ans :   (Aug.-21, Imp.)

An investment is a planned decision, and some of the factors that are responsible for these decisions are as follows:

➢ **Investment Objective**

The purpose behind an investment determines the short-term or long-term fund allocation. It is the starting point of the decision-making process.

➢ **Return on Investment**

Managers prioritize positive returns - they try to employ limited funds in a profitable asset or security.

➢ **Return Frequency**

The number of periodic returns an investment offer is crucial. Financial management is based on financial needs; investors choose between investments that yield monthly, quarterly, semi-annual, or annual returns.

➢ **Risk Involved**

An investment may possess high, medium, or low risk, and the risk appetite of every investor and company is different. Therefore, every investment requires a risk analysis.

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➢ **Risk Involved**

An investment may possess high, medium, or low risk, and the risk appetite of every investor and company is different. Therefore, every investment requires a risk analysis.

➢ **Maturity Period or Investment Tenure**

Investments pay off when funds are blocked for a certain period. Thus, investor decisions are influenced by the maturity period and payback period.

➢ **Tax Benefit**

Tax liability associated with a particular asset or security is another crucial deciding factor. Investors tend to avoid investment opportunities that are taxed heavily.

➢ **Safety**

An asset or security offered by a company that adheres to regulatory frameworks and has a transparent financial disclosure is considered safe. Government-backed assets are considered the most secure.

➢ **Volatility**

Market fluctuations significantly affect investment returns and, therefore, cannot be overlooked.

➢ **Liquidity**

Investors are often worried about their emergency funds-the provision to withdraw money before maturity. Hence, investors look at the degree of liquidity offered by a particular asset or security; they specifically consider withdrawal restrictions and penalties.

➢ **Inflation Rate**

In financial management, investors look for investment opportunities where returns surpass the nation's inflation rate.

1.7 INVESTMENT ENVIRONMENT

Q15. Discuss briefly about Investment Environment.

Ans :   (Dec.-19, Dec.-18, Imp.)

The investment environment consists of various types of securities and the buying and selling decisions relating to such decisions.

A) Securities

Investments in capital markets is in various financial instruments, which are all claims on money. These instruments may be of various categories with different characteristics. These are called 'Securities' in market place.

Securities Contracts Regulation Act, 1956 has defined the security as inclusive of shares, scrips, stocks, bonds, debenture stock or any other marketable instruments of a like nature in or of any debentures of a company or body corporate, the government and semi-government body etc. It includes all rights & interests in them including warrants and loyalty coupons etc., issued by any of the bodies, organizations or the government. The derivatives of securities and Security Index are also included as securities.

Characteristics

1.   Securities are tradable and represent a financial value.

2.   Securities are fungible.

Classification

(i)   Debt Securities

Tradable assets which have clearly defined terms and conditions are called debt securities. Financial instruments sold and purchased between parties with clearly mentioned interest rate, principal amount, maturity date as well as rate of returns are called debt securities.

(ii)   Equity Securities

Financial instruments signifying the ownership of an individual in an organization are called equity securities. An individual buying equities has an ownership in the company's profits and assets.

(iii)   Derivatives

Derivatives are financial instruments with specific conditions under which payments need to be made between two parties.

B)   Risk, Return and Diversification

The Main Objectives of Investment Environment in India. They are :

1.   Minimizing the Risk

2.   Maximizing the Returns

3.   Diversification of the Company

1.   Minimizing the Risk

The risk of holding securities is related to the probability of the actual return becoming less than the expected return. The word 'risk' is synonymous with the phrase 'variability of return'. Investment risk is just as important as measuring its expected rate of return because minimizing risk and maximizing the rate of return are interrelated objectives in investment management. An investment whose rate of return varies widely from one period to another is considered riskier than one whose return does not change much. Every investor likes to reduce the risk of his investment by proper combination of different securities. Investors, however, differ in their attitude towards risk.

2.   Maximizing the Returns

Investors always expect a good rate of return from their investments. The rate of return could be defined as the total income the investor receives during the holding period, stated as a percentage of the purchasing price at the beginning of the holding period.

$$Return = \frac{End\ period\ value - Beginning\ period\ value + Dividend}{Beginning\ period\ value} \times 100$$

The rate of return is stated semi-annually or annually to help compare among the different investment alternatives. If it is a stock, the investor gets the dividend as well as the capital appreciation as returns. Market return of the stock indicates the price appreciation for the particular stock. If a particular share is bought in 2011 at ₹50 and sold in 2012 at ₹60, and the dividend yield is ₹5, then the return would be calculated as shown below :

$$\text{Return} = \frac{\text{Capital appreciations and dividend}}{\text{Purchase price}} \times 100$$

$$\text{Return} = \frac{10 + 5}{50} \times 100 = 30\%.$$

3.   Diversification of the Company

The main objective of diversification is the reduction of risk in the form of loss of capital and income. A diversified portfolio is comparatively less risky than holding a single portfolio. Several modes are available to diversify a portfolio.

(i)   Debt and equity diversification

Debt instruments provide assured returns with limited capital appreciation. Common stocks provide income and capital gain but with a flavour of uncertainty. Both debt instruments and equity are combined to complement each other.

(ii)   Industry diversification

Industries' growth and their reaction to government policies differ from each other. Banking industry shares may provide regular returns but with limited capital appreciation. Information technology stocks yield higher returns and capital appreciation, but their growth potential in the post-global crisis years was unpredictable. Thus, industry diversification is needed, and it reduces the risk.

(iii)   Company diversification

Securities from different companies are purchased to reduce the risk. Technical analysts suggest that investors buy securities based on price movement. Fundamental analysts suggest the selection of financially sound and investor-friendly companies.

(iv)   Selection

Securities have to be selected based on the level of diversification, industry and company analyses. Funds are allocated for selected securities. Selection of securities and the allocation of funds seal the construction of portfolio.

C)   Security Markets

The securities market is the market for equity, debt and derivatives. The debt market, in turn, maybe divided into three parts, viz., the government securities market, the corporate debt market, and the money market. The derivatives market, in turn, may be divided into two parts viz, the options market and the future market. The following is the structure of security market.

Participants

The participants of the securities market are listed below :

1.   The issuer

2.   The buyer

3.   Market intermediaries

4.   The regulators

1.   Issuer

The following issuers are in the securities market :

➤   Corporate entities issue equity shares and debentures, while financial institutions and public sector enterprises issue equity shares as well as bonds.

➢ The Reserve Bank of India issues government dated securities, treasury bills and bonds.

➢ Mutual fund companies issue mutual fund units. Many mutual fund companies are subsidiaries of financial institutions and banks.

2. Buyer

The buyer segment consists of domestic institutional investors, corporate entities, banks, pension funds, mutual funds, retail investors and foreign institutional investors who are registered with the Securities and Exchange Board of India (SEBI).

3. Market intermediaries

A wide range of market intermediaries participate in the primary and secondary markets. Merchant bankers, clearing and settling houses, credit rating agencies, depositories, debenture trustees, banks and brokers act as market intermediaries at various levels.

4. Regulators

The smooth functioning of any market lies in the hands of regulators. The securities market also requires regulation for the following reasons :

➢ It involves a huge inflow and outflow of funds.

➢ The nature and the quantum of issue of securities differ widely among companies. This necessitates the prescription of issue norms.

➢ Proper functioning of the secondary market is essential.

➢ Investors' interests have to be protected.

The securities market is mainly regulated by the Ministry of Finance, the Reserve Bank of India and SEBI.

d) Financial Intermediaries

Financial intermediaries, also known as financial institutions, are organizations that issue financial claims against themselves (meaning that they sell financial assets rep-resenting claims on themselves in return for cash) and use the proceeds from this is insurance to purchase primarily the financial assets of others. Financial claims simply represent the right-hand side of the balance sheet for any organization, so the key distinction between financial intermediaries and other types of organizations involves what is on the left-hand side of the balance sheet.

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1.8 SECURITIES MARKET OF INDIA

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Q16. What do you mean by Securities Market? Classify Security Market in detail.

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(OR)

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Write in detail the structure of primary and secondary securities market in India.

Ans :   (Aug.-21, Imp.)

Meaning

The securities market refers to the market for equity debt and derivatives. The debt market is further classified into three types i.e., the government securities market, the corporate debt market and the money market. The derivatives markets are also further classified into two types namely the options market and the futures market. Securities market is the market which influences the modem life greatly.

Classification

Securities markets are broadly classified into two types as follows,

1. Primary markets and

2. Secondary markets.

1. Primary Markets

The market where in new securities are being issued in lieu of each from an investor is called as primary market. Investment bankers are mostly being used as the instrument of activities. New issue of securities which takes place in the primary market are the new sales of treasury bills or IBM stock, or North Carolina bonds.

In India Equity market is also called as primary market which functions as per the guidelines of SEB1 (Securities Exchange Board of India). There are three different ways by which a company can raise its equity capital in the primary market. They are,

(i) Public issue

(ii) Rights issue

(iii) Preferential allotment

(iv) Global investment banking

(v) Private Placements

(i) Public Issue

Public issue is the sale of securities to the public at large and is governed and controlled by the provisions of the companies Act, 1956, SEBI guidelines about Investor Protection and the listing agreement between the issuing company and the stock exchanges.

(ii) Rights Issue

Rights issue is an official invitation given by the company to its shareholders regarding the subscription for the purchase of further shares issued by a company. A 'right' represents an option or a choice that has to be made by a shareholder for the purchase of securities at a predetermined price. A limited company after obtaining the approval from its articles of association can issue new shares (either equity or preference) such terms ensure the equitable distribution of shares without altering the existing shareholdings in the company.

(iii) Preferential Allotment

Preferential Allotment means an issue of an equity by a listed company to the selected investors at a price which may or may not be in accordance with the prevailing market price especially in the Indian Capital Market.

(iv) Global Investment Banking

Initially selling of new securities was restricted only in the domestic markets but, presently the scenario has been changed due to globalization. The globalization enables and helps the companies to raise new capital from different countries across the globe. A new concept has been introduced as "global equity offering" -in the investment banking.

(v) Private Placements

Recently, many corporations have started introducing the "private placement" where in the new securities issues such as debt securities are being directly sold to the financial institution like Life Insurance Companies and pension by passing the open market.

2. Secondary Markets

A secondary market is the market in which the remaining or the existing securities are traded between the investors. These markets helps the investors by providing them a mechanism for trading the existing securities. In this market, securities are resold when investors considers these securities as attractive opportunities. Secondary market is the place where common and preferred stock, warranty, bonds and puts and calls are traded among the investors.

The Equities are traded in the below given markets,

(i) New York Stock Exchange (NYSE)

It is one of the oldest and most famous secondary market in the United States. It is considered as one of the most effectively controlled stock exchange in the world which also has the ability to function during units.

The NYSE is a not-for-profit organization which has member firms who own seats and only these member firms can buy and sell securities on the trading floor.

(ii) American Stock Exchange (AMEX)

The Amex is the second national organized exchange whose procedures are similar to the procedures of NYSE However, when compared NYSE. AMEX is smaller whose membership is limited only upto 807 regular members the listing requirements of AMEX are less complicated on strict when compared to the NYSE. At present, AMEX trades nearly 135 NASDAQ-listed stocks.

(iii) The NASDAQ Stock Market

The Nasdaq stock market is a competitive dealer market which consists of network of dealers or market makers who creates market and are ready to buy and sell securities at specified prices.

The actively traded stocks which are not traded at the NYSE or Amex are a part of NASDAQ stock market (NASDAQ). Nasdaq was initially introduced by the NASD (The National Association of Security Dealers) which is a self-governing body of brokers and dealers. Presently, NASDAQ is a privately owned corporation by its shareholders.

(iv) Over-the-Counter Stocks

Over-the-counter securities means the securities which are not listed and traded at an organized exchange on market.

(v) Electronic Communications Net-works (ECN's)

Conventional form of Trading equity securities through agency auction markets have been replaced by fully computerized NASDAQ market. The modem changes of Electronic Communication Networks {ECN's} have a clear impact on the functioning of the conventional markets like NASDAQ and the NYSE.

(vi) National Stock Exchange (NSE)

The National Stock Exchange was started in November 1992. Its initial capital outlay was ₹ 25 crores which was subscribed by the Industrial Development Bank of India (IDBI) and co-subscribed by other lending institutions such as GIC, LIC, other insurance companies, banks, financial institutions including the SBI capital market Ltd, Stock Holding Corporations Ltd, Infrastructure Leasing and Financial Services Ltd and International Securities Consultancy of Hongkong. NSE has an automated, electronic and screen based system of trading.

(vii) Bombay Stock Exchange (BSE)

Bombay Stock Exchange is an ancient stock exchange in India. In is regarded as the most important part of the economy which reveals the economic conditions. Basically BSE was operating in Mumbai alone but with the help of Bombay Online Trading System (BOLT), its operations spread over to 275 cities by March 2000. The number of trade workstations was also increased to 3803. There was an increase in its daily turnover from ₹ 11 crores during 1979-1980 to ₹ 4587 crores in the year 2000-2001.

1.9 SECURITIES TRADING AND SETTLEMENT

Q17. Examine the recent trends in security market.

(OR)

Discuss in detail the important features of Securities Trading and Settlement.

(OR)

Briefly explain the Securities Institutions viz., NSE, SEBI and NSDI., which provide greater scope for Indian Stock Markets.

Ans :   *(Oct.-20, Dec.-19, Imp.)*

Many recent trends occurred in stock markets in India. Several institutions were established which provided greater scope for Indian stock markets. These institutions are as follows,

1. National Stock Exchange (NSE)

In November 199.2, the NSE was established and started dealing with debt instruments such as treasury bills, UTI units, government securities, PSU-bonds and call money, but later the debentures and equities were also included in the list of trading. The headquarters of National Stock Exchange (NSE) is located in Mumbai and it carries out its transactions with the help of screen based online trading system. Its members are spread across the country and are connected through satellite and cables to the system.

2. Securities Trading Corporation of India (STCI)

Reserve Bank of India started the STCI with a paid-up capital of ₹ 500 crore. The main aim of

STCI is to encourage the growth of secondary market for the government securities and to extend the debt market. At present, the commercial banks and financial institutions are the owners of STCI, as RBI did not took the further responsibility of STCI after 2002.

3. **Securities Exchange Board of India (SEBI)**

   SEBI was established with the main objective of regulating the transactions in stock exchange in a fair manner and protect the interest of the investors. It has performed efficiently and there are several achievements to its credit, some of them are as follows,

   (i) Elimination of the control over capital issues and preserving the authority for governing new issues.

   (ii) Governing stock exchanges as per the provisions of securities contracts regulation act.

   (iii) Making it mandatory for the firms to disclose the material facts and certain risk factors that are related with the projects.

   (iv) Drawing all the primary and secondary market intermediaries under the regulatory framework.

4. **National Securities Depositary Ltd (NSDL)**

   During 1996, NSDL was established which started the method of dematerialization process of shares of the participating firms and made an end to process of poor deliveries. The introduction of the depository system was one of the distinct feature of NSDL. In this system, the share certificate is submitted by the shareholder to the issuer firm and there the certificate will be dematerialized in the depository's computerized records, due to which the depositor will become the 'registered owner' of share and the shareholder will become the 'beneficial owner'.

1.10 TYPES OF ORDERS

Q18. What are the different types of orders ?

(OR)

Discuss in detail the various types of orders.

Ans : (Dec.-18, Imp.)

There are several types of orders that investors can place with their brokers. The most common types are market and limit orders, although stop and stop limit orders can also be used. There are other special types of orders that are rarely used; readers interested in them should contact their broker.

1. **Market Order**

   Market order, wherein the broker is instructed to buy or sell a stated number of shares immediately. The broker is obligated to act on a best efforts basis to get the best possible price (as low as possible for a purchase order, as high as possible for a sell order) when the order is placed. An investor placing a market order can be fairly certain that the order will be executed but will be uncertain of the price.

2. **Limit Order**

   Limit order, wherein a limit price is specified by the investor when the order is placed with the broker. If the order is to purchase shares, the broker is to execute the order at a price less than or equal to the limit price. If the order is to sell shares, the broker is to execute the order at a price greater than or equal to the limit price. Thus, the investor specifies a ceiling on the price to purchase shares and a floor on the price to sell shares.

3. **Stop Order**

   For a stop order the investor must specify a stop price. If it is a sell order, the stop price must be below the market price when the order is placed. Conversely, if it is a buy order, the stop price must be above the market price when the order is placed. If someone later trades the stock at a price that reaches or passes the stop price, the stop order becomes, in effect, a market order.

4. **Stop Limit Order**

   The stop limit order helps investors know with more certainty the execution price associated with a stop order. With a stop limit order the investor specifies not one but two prices - a stop price and a limit price. Once someone trades the stock at a price that reaches or passes the stop price, then a limit order is created at the limit price.

1.11 MARGIN TRADING

Q19. Discuss briefly about margin trading.

(OR)

Explain about Margin Trading.

(OR)

What is margin trading ? How is it helpful in investors?

Ans : (Aug.-21, Dec.-19, Imp.)

Meaning

(i) In the stock market, margin trading refers to the process whereby individual investors buy more stocks than they can afford to.

(ii) Margin trading also refers to intraday trading in India and various stock brokers provide this service.

(iii) Margin trading involves buying and selling of securities in one single session. Over time, various brokerages have relaxed the approach on time duration.

(iv) The process requires an investor to speculate or guess the stock movement in a particular session.

(v) Margin trading is an easy way of making a fast buck. With the advent of electronic stock exchanges, the once specialized field is now accessible to even small traders.

(vi) The process is fairly simple. A margin account provides you the resources to buy more quantities of a stock than you can afford at any point of time.

(vii) For this purpose, the broker would lend the money to buy shares and keep them as collateral.

(viii) In order to trade with a margin account, you are first required to place a request with your broker to open a margin account.

(ix) This requires you to pay a certain amount of money upfront to the broker in cash, which is called the minimum margin. This would help the broker recover some money by squaring off, should the trader lose the bet and fail to recuperate the money.

(x) Once the account is open, you are required to pay an initial margin (IM), which is a certain percentage of the total traded value pre-determined by the broker. Before you start trading, you need to remember three important steps.

Q20. Write a note on Sensex. State its benefits.

Ans : (April - 23, Imp.)

Meaning

The full form of SENSEX is Stock Exchange Sensitive Index. SENSEX is the oldest stock exchange in India and is also termed as BSE (Bombay Stock Exchange). It is a free float, economy-weighted index of 30 financially sound and very well-established organizations listed on BSE. These firms are also branded as Blue chip companies in India. The 30 constituent corporations that are among the most successful and highest traded stocks are representatives of various industries in India.

Benefits

➤ SENSEX offers greater visibility and enhances a company's reputation. It raises the market for the company's shares and also leverages the same valuation.

➤ It further strengthens the company's reputation because it includes the top-performing firms that are a matter of distinction to themselves.

➤ It enables an enterprise to raise their share capital.

➤ SENSEX provides growth opportunities, such as mergers, expansions and acquisitions.

It provides numerous other benefits as well, such as scope for workers efficiency in risk distribution & incentives.

Q21. Explain in detail the methodology adopted in trading shares in stock exchange.

Ans : (April - 23, Imp.)

The following methodology adopted in trading shares in stock exchange.

1. Selection of Broker

One can buy and sell securities only through the brokers registered under SEBI and who are members of the stock exchange. A broker can be a partnership firm, an individual, or a corporate body. Hence, the first step of the trading procedure is the selection of a broker who will buy/sell securities on the behalf of a speculator or investor. Before placing an order to the registered broker, the investor has to provide some information, including PAN Number, Date of Birth and Address, Educational Qualification and Occupation, Residential Status (Indian/NRI), Bank Account Details, Depository A/c details,

Name of any other brokers with whom they have registered, and Client code number in the client registration form. After getting information regarding all the said things, the broker opens a trading account in the name of the investor.

2.   Opening Demat Account with Depository

An account that must be opened with the Depository Participant (including stock brokers or banks) by an Indian citizen for trading in the listed securities in electronic form is known as Demat (Dematerialized) Account or Beneficial Owner (BO) Account.

The second step of the trading procedure is the opening of a Demat Account. The Depository holds the securities in electronic form. A Depository is an organization or institution, which holds securities like bonds, shares, debentures, etc. At present there are two Depositories; namely, NSDL (National Securities Depository Ltd.) and CDSL (Central Depository Securities Ltd.). The Depository and the investor do not have direct contact with each other and interact with each other through Depository Participants only. The Depository Participant will have to maintain the securities account balances of the investor and intimate investor from time to time about the status of their holdings.

3.   Placing the Order

The next step after the opening of a Demat Account is the placing of an order by the investor. The investor can place the order to the broker either personally or through email, phone, etc. The investor must make sure that the order placed clearly specifies the range or price at which the securities can be sold or bought. For example, an order placed by Kashish is, "Buy 200 equity shares of Nestle for no more than [1] 200 per share."

4.   Match the Share and Best Price

The broker after receiving an order from the investor will have to then go online and connect to the main stock exchange to match the share and best price available.

5.   Executing Order

When the shares can be bought or sold at the price mentioned by the investor, it will be communicated to the broker terminal, and then the order will be executed electronically. Once the order has been executed, the broker will issue a trade confirmation slip to the investors.

6.   Issue of Contract Note

Once the trade has been executed within 24 hours, the broker will issue a contract note. A contract note consists of the details of the number of shares bought or sold, the date, time of the deal, price of securities, and brokerage charges. A contract note is an essential legal document. It helps in settling disputes claims between the investors and the brokers. A contract note also consists of a printed unique order code number assigned to each transaction by the Stock Exchange.

7.   Delivery of Share and making Payment

In the next step, the investor has to deliver the shares sold or has to pay cash for the shares bought. The investor has to do so immediately after receiving the contract note or before the day when the broker shall make delivery of shares to the exchange or make payment. This is known as Pay in Day.

8.   Settlement Cycle

The payment of securities in cash or delivery of securities is done on Pay in Day, which is before T+2 Day. It is because the settlement cycle is T+2 days on w.e.f April 2003 rolling settlement basis. For example, if the transaction took place on Tuesday, then the payment must be done before Thursday, i.e., T+2 days (Transaction plus two more days).

9.   Delivery of Shares or Making Payment

On the T+2 Day, the Stock Exchange will then deliver the share or make payment to the other broker. This is known as Pay out Day. Once the shares have been delivered of payment has been made, the broker has to make payment to the investor within 24 hours of the pay out day, as he/she has already received payment from the exchange.

10.   Delivery of Shares in Demat Form

The last step of the trading procedure is making delivery or shares in Demat form by the broker directly to the Demat Account of the investor. The investor is obligated to give details of his Demat Account and instruct his Depository Participant (DP) for taking delivery of securities directly in his beneficial owner account.

1.12 ROLES AND RESPONSIBILITIES OF SEBI

Q22. Define SEBI. Explain the purpose and role of SEBI.

Ans :   **(Imp.)**

Meaning

Securities Exchange Board of India (SEBI) was set up in April 12, 1988 to regulate the functions of securities market. SEBI promotes orderly and healthy development in the stock market but initially SEBI was not able to exercise complete control over the stock market transactions.

It was left as a watch dog to observe the activities but was found ineffective in regulating and controlling them. As a result in May 1992, SEBI was granted legal status. SEBI is a body corporate having a separate legal existence and perpetual succession.

Reasons for Establishment of SEBI

With the growth in the dealings of stock markets, lot of malpractices also started in stock markets such as price rigging, unofficial premium on new issue, and delay in delivery of shares, violation of rules and regulations of stock exchange and listing requirements. Due to these malpractices the customers started losing confidence and faith in the stock exchange. So government of India decided to set up an agency or regulatory body known as Securities Exchange Board of India (SEBI).

Purpose and Role of SEBI

SEBI was set up with the main purpose of keeping a check on malpractices and protect the interest of investors. It was set up to meet the needs of three groups.

1. Issuers

For issuers it provides a market place in which they can raise finance fairly and easily.

2. Investors

For investors it provides protection and supply of accurate and correct information.

3. Intermediaries

For intermediaries it provides a competitive professional market.

Q23. Explain the Composition and Objectives SEBI.

Ans :

Composition

The Board of Securities & Exchange Board of India (SEBI) is comprised of 9 members, excluding the Chairman. It is managed by its members, in the following manner:

➤ A Chairman is nominated by the Union Government.

➤ 2 members of SEBI, are officers from the Union Ministry of Finance.

➤ 1 member of SEBI, is from the Reserve Bank of India.

➤ There are 3 whole-time members, who are nominated by the Government of India.

➤ There are 2 Part-time members, who are also nominated by the Government of India.

Objectives

The SEBI was set up to achieve the following objectives:

(i) Regulation of Stock Exchanges

The first objective of SEBI is to regulate stock exchanges so that efficient services may be provided to all the parties operating there.

(ii) Protection to the Investors

The capital market is meaningless in the absence of the investors. Therefore, it is important to protect the interests of the investors. The protection of the interests of the investors means protecting them from the wrong information given by the companies in their prospectus, reducing the risk of delivery and payment, etc. Hence, the foremost objective of the SEBI is to provide security to the investors.

(iii) Checking the Insider Trading

Insider trading means the buying and selling of securities by those persons (Directors, Promoters, etc.) who have some secret information about the company and who wish to take advantage of this secret information. This hurts the interests of the general investors. It was very essential to check this tendency. Many steps have been taken to check inside trading through the medium of the SEBI.

(iv) Control over Brokers

It is important to keep an eye on the activities of the brokers and other middlemen in order to control the capital market. To have a control over them, it was necessary to establish the SEBI.

Q24. Explain the powers of SEBI.

Ans :

SEBI has been vested with the following powers.

1. Power to call periodical returns from recognized stock exchanges.

2. Power to call any information or explanation from recognized stock exchanges or their members.

3. Power to direct enquiries to be made in relation to affairs of stock exchanges or their members.

4. Power to grant approval to bye-laws of recognized stock exchanges.

5. Power to make or amend bye-laws of recognized stock exchanges.

6. Power to compel listing of securities by public companies.

7. Power to control and regulate stock exchanges.

8. Power to grant registration to market intermediaries.

9. Power to levy fees or other charges for carrying out the purpose of regulation.

10. Power to declare applicability of Section 17 of the Securities Contract (Regulation) Act is any state or area to grant licences to dealers in securities.

Q25. Explain the functions of SEBI.

(OR)

Describe the functions of SEBi.

(OR)

Elaborate the protective and development functions of SEBI.

(OR)

What are the regulatory functions of SEBI?

(OR)

Give a detailed note on functions of SEBI.

Ans : **(Imp.)**

The SEBI performs functions to meet its objectives. To meet three objectives SEBI has three important functions. These are :

1. Protective functions

2. Developmental functions

3. Regulatory functions.

1. Protective Functions of SEBI

These functions are performed by SEBI to protect the interest of investor and provide safety of investment.

As protective functions SEBI performs following functions:

(i) It Checks Price Rigging

Price rigging refers to manipulating the prices of securities with the main objective of inflating or depressing the market price of securities. SEBI prohibits such practice because this can defraud and cheat the investors.

(ii) It Prohibits Insider trading

Insider is any person connected with the company such as directors, promoters etc. These insiders have sensitive information which affects the prices of the securities.

This information is not available to people at large but the insiders get this privileged information by working inside the company and if they use this information to make profit, then it is known as insider trading, e.g., the directors of a company may know that company will issue Bonus shares to its shareholders at the end of year and they purchase shares from market to make profit with bonus issue.

This is known as insider trading. SEBI keeps a strict check when insiders are buying securities of the company and takes strict action on insider trading.

(iii) SEBI prohibits fraudulent and Unfair Trade Practices

SEBI does not allow the companies to make misleading statements which are likely to induce the sale or purchase of securities by any other person.

(iv) SEBI undertakes steps to educate investors so that they are able to evaluate the securities of various companies and select the most profitable securities.

(v) SEBI promotes fair practices and code of conduct in security market by taking following steps:

(a) SEBI has issued guidelines to protect the interest of debenture-holders wherein companies cannot change terms in midterm.

(b) SEBI is empowered to investigate cases of insider trading and has provisions for stiff fine and imprisonment.

(c) SEBI has stopped the practice of making preferential allotment of shares unrelated to market prices.
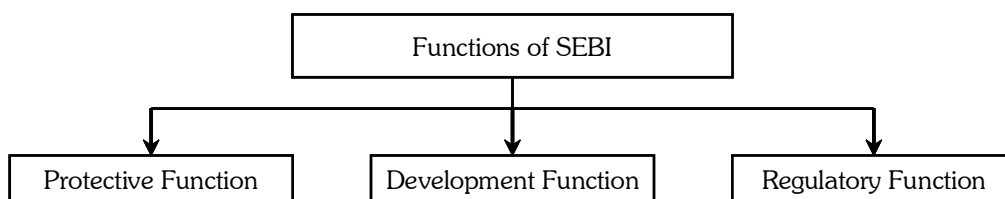
Fig.: Functions of SEBI

2. **Developmental Functions**

There are various developmental functions of SEBI. Some of them are as follows:

➢ **Promoting fair trade**

It has made underwriting optional in order to achieve the goal of promotion of fair trade.

➢ **Research**

SEBI also makes a publication of the data and information which is necessary for various participants of the market in order to conduct effective research.

➢ **Training of brokers**

Intermediaries of the securities market are trained to promote the efficiency of the market.

3. **Regulatory Functions**

These are various regulatory functions of SEBI, some of them are as follows :

➢ **Notifications of various Rules and Regulations**

SEBI is empowered to issue various rules and regulations to make the functioning of all the intermediaries existing in the securities market smooth.

➢ **Levying of Fees**

If any of the players of the market contravenes any order or direction passed by it, SEBI has the power to levy penalties, fees and other charges for the same.

➢ **Registration of Agents and Brokers**

For the purpose of making a safe market place for trading into the securities, it is mandatory for all the transfer agents, brokers, merchant banks, sub-brokers and so on to register themselves.

➢ **Prohibition of unfair trade practices**

SEBI has been entrusted with the primary duty of protecting the interests of investors. Hence, it prevents various fraudulent and unfair trade practices prevalent in the market to cheat the investors.

➢   **Regulator of Investment Schemes**

It has made the registration of mutual funds and collective investment schemes mandatory in order to regulate them.

➢   **Exercising and Performing Powers**

SEBI has been delegated various powers under the Securities Contracts (Regulation) Act 1956 by the Government of India. SEBI exercises and performs all such powers.

➢   **Enquiries and Inspection**

SEBI conducts various inspections and undertakes audits and enquiries of stock exchanges of India.

Q26. Explain the role of SEBI in Indian Capital Market ?

Ans :

SEBI is regulator to control Indian capital market. Since its establishment in 1992, it is doing hard work for protecting the interests of Indian investors. SEBI gets education from past cheating with naive investors of India. Now, SEBI is more strict with those who commit frauds in capital market.

The role of security exchange board of India (SEBI) in regulating Indian capital market is very important because government of India can only open or take decision to open new stock exchange in India after getting advice from SEBI.

If SEBI thinks that it will be against its rules and regulations, SEBI can ban on any stock exchange to trade in shares and stocks.

Now, we explain role of SEBI in regulating Indian Capital Market more deeply with following points :

1. Power to make rules for controlling stock exchange

SEBI has power to make new rules for controlling stock exchange in India. For example, SEBI fixed the time of trading 9 AM and 5 PM in stock market.

2. To provide license to dealers and brokers

SEBI has power to provide license to dealers and brokers of capital market. If SEBI sees that any financial product is of capital nature, then SEBI can also control to that product and its dealers. One of main example is ULIPs case. SEBI said, "It is just like mutual funds and all banks and financial and insurance companies who want to issue it, must take permission from SEBI."

3. To Stop fraud in Capital Market

SEBI has many powers for stopping fraud in capital market.

It can ban on the trading of those brokers who are involved in fraudulent and unfair trade practices relating to stock market.

It can impose the penalties on capital market intermediaries if they involve in insider trading.

4. To Control the Merge, Acquisition and Takeover the companies

Many big companies in India want to create monopoly in capital market. So, these companies buy all other companies (or) deal of merging. SEBI sees whether this merge (or) acquisition is for development of business (or) to harm capital market.

5. To audit the performance of stock market

SEBI uses his powers to audit the performance of different Indian stock exchange for bringing transparency in the working of stock exchanges.

6. To make new rules on carry - forward transactions

Share trading transactions carry forward can not exceed 25% of broker's total transactions.

90 day limit for carry forward.

7. To create relationship with ICAI

ICAI is the authority for making new auditors of companies. SEBI creates good relationship with ICAI for bringing more transparency in the auditing work of company accounts because audited financial statements are mirror to see the real face of company and after this investors can decide to invest or not to invest. Moreover, investors of India can easily trust on audited financial reports. After Satyam Scam, SEBI is investigating with ICAI, whether CAs are doing their duty by ethical way or not.

8. Introduction of derivative contracts on Volatility Index

For reducing the risk of investors, SEBI has now been decided to permit Stock Exchanges to introduce derivative contracts on Volatility Index, subject to the condition that;

(a)   The underlying Volatility Index has a track record of at least one year.

(b) The Exchange has in place the appropriate risk management framework for such derivative contracts.

(c) Before introduction of such contracts, the Stock Exchanges shall submit the following:

    (i) Contract specifications

    (ii) Position and Exercise Limits

    (iii) Margins

    (iv) The economic purpose it is intended to serve

    (v) Likely contribution to market development

    (vi) The safeguards and the risk protection mechanism adopted by the exchange to ensure market integrity, protection of investors and smooth and orderly trading.

    (vii) The infrastructure of the exchange and the surveillance system to effectively monitor trading in such contracts, and

    (viii) Details of settlement procedures & systems

    (ix) Details of back testing of the margin calculation for a period of one year considering a call and a put option on the underlying with a delta of 0.25 & -0.25 respectively and actual value of the underlying.

9. To Require report of Portfolio Management Activities

SEBI has also power to require report of portfolio management to check the capital market performance. Recently, SEBI sent the letter to all Registered Portfolio Managers of India for demanding

10. To educate the investors

Time to time, SEBI arranges scheduled workshops to educate the investors. On 22 may 2010 SEBI imposed workshop. If you are investor, you can get education through SEBI leaders by getting update information .

Q27. Discuss the rules and regulations of SEBI.

Ans :

SEBI has adopted a number of regulations and revolutionary steps to re-establish the credit of capital market, which includes the following :

1. Share Price and Premium Determination

According to the latest directions of SEBI, Indian companies are now free to determine their share prices and premium on those shares. But determined price and premium amount will be equally applicable to all without any discrimination.

2. Control on Share Brokers

Under the new rules, every broker and sub-broker has to obtain registration with SEBI and any stock exchange in India.

3. Control on Utilizing 'Application Amount' having no Interest by Companies Releasing Public Issues

At the instance of SEBI, Commercial banks introduced Stock Investment Scheme under which investor has to submit stock-invests, purchased from banks, with their shares application. If the investor is allotted shares/ debentures, the required amount is transferred in concerned company's account by the bank issuing 'stock invest'.

4. Underwriters

The minimum asset limit has been fixed to be Rs. 20 lakh to work as underwriter. Besides, SEBI has warned underwriters that their registration can be cancelled if any irregularity is found in the purchase of unsubscribed part of the share issue.

5. SEBI's Control on Mutual Fund

SEBI (Mutual funds) Regulation 1993, help to take over direct control of all mutual funds of government and private sector (excluding UTI). Under this new rule, the company floating a mutual fund should possess net assets of Rs. 5 crore which should consist of atleast 40% contribution from promoter's side.

6. Control over Foreign Institutional Investors

SEBI has made it compulsory for every foreign institutional investor to get registered with SEBI for participating in Indian Capital Market. SEBI has issued directions in this regard.

29

7.   **Insider Trading**

Companies and their employees usually adopt malpractice in Indian Capital Market to variate share prices. To check this type of insider trading, SEBI introduced SEBI (insider Trading) Regulations, 1992, which will ensure honesty in the capital market and will develop a feeling of faith among investors to promote investments in capital market in the long-run.

Q28. How does SEBI protect the interest of investors? Explain.

Ans :

The SEBI has been made as a regulatory authority of the licence to buy back shares by the Ordinance. The regulations of SEBI contains the following:

1.   The companies are permitted to buyback the shares through six moves:

    (i)   Tender offers

    (ii)   Open offers

    (iii)   Dutch auction

    (iv)   Repurchase of odd lots

    (v)   Reverse rights issue

    (vi)   Employee stock option

2.   The companies are not permitted to buyback through negotiated deals, spot transactions and private placement.

3.   Promoters have been debarred from participating if the company options to buyback shares through stock exchange route.

4.   Companies buying through stock exchanges must disclose purchase details daily.

5.   The companies will have to specify the maximum price payable in the resolution seeking shareholders' approval.

6.   The buyback should be done only in cash and an escrow account will have to be maintained by the merchant bankers.

7.   No company is allowed to withdraw the buyback offer once it is announced.

Merchant bankers be associated in every offer for buyback where in they would be required to give a due diligence certificate.

The Registrar of shares (or) transfer agents will have to certify that the company has adhered to all regulations.

Short Question and Answers

1. Investment

Ans :

Investment means "sacrificing the present value of money for future benefits".

In finance, Investment means the purchase of a financial product or other item of value with an expectation of favourable future returns. In general terms, investment means the use of money with the hope of making more money.

In business, producer purchase physical goods, such as durable equipment or inventory, in the hope of improving future business.

According to Keynes, Investment is defined as, "The addition to the value of the capital equipment which has resulted from the productive activity of the period".

2. Types of Investment

Ans :

(i) Expansion and Diversification

(ii) Replacement and Modernization

(iii) Independent Investments

(iv) Contingent Investments

(v) Mutually Exclusive Investments

3. Functions of Speculation

Ans :

(i) Smoothen operating of price fluctuation process.

(ii) It maintains temporary equilibrium between capital supply and demand.

(iii) Consideration of future business prospects in determining the business value of existing capital funds.

(iv) Equating the risk to return in the infinitely varied utilizations of the social capital fund.

4. Investment Policy

Ans :

The government or the investor before proceeding into investment formulates the policy for the systematic functioning. The essential ingredients of the policy are the investible funds, objectives and the knowledge about the investment alternatives and market.

5. Diversification of the Company

Ans :

The main objective of diversification is the reduction of risk in the form of loss of capital and income. A diversified portfolio is comparatively less risky than holding a single portfolio. Several modes are available to diversify a portfolio.

(i) Debt and equity diversification

Debt instruments provide assured returns with limited capital appreciation.

(ii) Industry diversification

Industries' growth and their reaction to government policies differ from each other. Banking industry shares may provide regular returns but with limited capital appreciation.

(iii) Company diversification

Securities from different companies are purchased to reduce the risk. Technical analysts suggest that investors buy securities based on price movement.

(iv) Selection

Securities have to be selected based on the level of diversification, industry and company analyses. Funds are allocated for selected securities.

6. Secondary Markets

Ans :

A secondary market is the market in which the remaining or the existing securities are traded between the investors. These markets helps the investors by providing them a mechanism for trading the existing securities. In this market, securities are resold when investors considers these securities as attractive opportunities. Secondary market is the place where common and preferred stock, warranty, bonds and puts and calls are traded among the investors.

7.   **Different Types of Orders**

Ans :

(i)   **Market Order**

Market order, wherein the broker is instructed to buy or sell a stated number of shares immediately.

(ii)   **Limit Order**

Limit order, wherein a limit price is specified by the investor when the order is placed with the broker. If the order is to purchase shares, the broker is to execute the order at a price less than or equal to the limit price.

(iii)   **Stop Order**

For a stop order the investor must specify a stop price. If it is a sell order, the stop price must be below the market price when the order is placed. Conversely, if it is a buy order, the stop price must be above the market price when the order is placed.

(iv)   **Stop Limit Order**

The stop limit order helps investors know with more certainty the execution price associated with a stop order. With a stop limit order the investor specifies not one but two prices - a stop price and a limit price.

8.   **Margin Trading**

Ans :

In the stock market, margin trading refers to the process whereby individual investors buy more stocks than they can afford to. Margin trading also refers to intraday trading in India and various stock brokers provide this service. Margin trading involves buying and selling of securities in one single session. Over time, various brokerages have relaxed the approach on time duration. The process requires an investor to speculate or guess the stock movement in a particular session. Margin trading is an easy way of making a fast buck. With the advent of electronic stock exchanges, the once specialized field is now accessible to even small traders.

9.   **Features of Speculation**

Ans :

Following are the features of speculation:

i)   One tries to buy the goods when they are cheap and to sell them when they are expensive. There is a good chance to do that as long as the market price of a good changes often in different directions.

ii)   Speculation includes the buying, holding, selling, and short-selling of stocks, bonds, commodities, currencies, collectibles, real estate, derivatives, or any valuable financial instrument.

10.   **Investment vs. Gambling.**

Ans :

S.No.	Nature	Investment	Gambling
1.	**Creation of Risk**	In the case investment. the investors deal with pre-existing risk.	Here gambler creates risk.
2.	**Transfer of Risk**	Transferring the risk from investors to insurance companies.	In the case of gambling, transferring or shifting the risks are not possible.
3.	**Expected Return**	Investing has a positive expected return.	Gambling has a negative expected return.

11.   What factors must be considered by an investor while making investment decisions?

Ans :

An investment is a planned decision, and some of the factors that are responsible for these decisions are as follows:

➢   **Investment Objective**

The purpose behind an investment determines the short-term or long-term fund allocation. It is the starting point of the decision-making process.

➢   **Return on Investment**

Managers prioritize positive returns - they try to employ limited funds in a profitable asset or security.

➢   **Return Frequency**

The number of periodic returns an investment offer is crucial. Financial management is based on financial needs; investors choose between investments that yield monthly, quarterly, semi-annual, or annual returns.

➢   **Risk Involved**

An investment may possess high, medium, or low risk, and the risk appetite of every investor and company is different. Therefore, every investment requires a risk analysis.

12.   Gambling

Ans :

Gambling is the wagering of money or something of value (referred to as "the stakes") on an event with an uncertain outcome, with the primary intent of winning money or material goods. Gambling thus requires three elements be present: consideration, risk (chance), and a prize. The outcome of the wager is often immediate, such as a single roll of dice, a spin of a roulette wheel, or a horse crossing the finish line, but longer time frames are also common, allowing wagers on the outcome of a future sports contest or even an entire sports season.

Choose the Correct Answers

1. Investments are the _____.   [c]
    (a) net additions made to the nation's capital stocks
    (b) person's commitment to buying a flat or a house
    (c) employment of funds on assets to earn returns
    (d) employment of funds on goods and services that are used in the production process

2. Speculator is a person _____.   [d]
    (a) who evaluates the performance of the company
    (b) who uses his own funds only
    (c) who is willing to take high risk for high return
    (d) who considers heresays and market behaviours

3. To frame the investment policy the investor should have _____.   [d]
    (a) knowledge about the company and brokers   (b) investible funds
    (c) knowledge about the investment alternatives (d) knowledge about the capital markets

4. The stock is _____.   [b]
    (a) made up of small units of equal value called shares
    (b) expressed in terms of money
    (c) expressed in terms of number of shares
    (d) fully paid-up and partly paid-up shares

5. The aggressive investor buys more of _____.   [c]
    (a) money market instruments   (b) gold
    (c) equity shares   (d) options and futures

6. Investment made on a house property is a _____.   [d]
    (a) financial investment   (b) economic investment
    (c) non-negotiable financial investment   (d) non-financial investment

7. Which one of the following is not a money market security?   [b]
    (a) treasury bills   (b) national savings certificate
    (c) certificate of deposit   (d) commercial paper

8. Commercial papers are issued for a minimum period of _____.   [a]
    (a) seven days   (b) fifteen days
    (c) one month   (d) three months

9. Certificate of deposit is issued in multiples of _____.   [c]
    (a) ₹ 5 lakh   (b) ₹ 10 lakh
    (c) ₹ 1 lakh   (d) ₹ 25 lakh

10. This particular scheme helps in deferring the tax payment _____.   [b]
    (a) public provident fund   (b) national savings scheme
    (c) national savings certificate   (d) life insurance scheme

11. NBFCs offer higher interest rate because of the _____.   [c]
    (a) best management funds   (b) competition among the NBFCs
    (c) risk involved   (d) credit

Fill in the Blanks

1. _____ is the employment of funds with the aim of achieving additional income or growth in value.

2. _____ system is the integrated form of financial institutions, financial markets, financial securities, and financial services

3. A _____ system refers to a system which enables the transfer of money between investors and borrowers.

4. _____ market consists of overnight financing and money needed at short notice for periods upto 14 days.

5. The _____ bills are referred as the short term liability of the central government in India.

6. The person who speculates is called a _____.

7. _____ of an investment refers to the variability of its rate of return.

8. _____ offers a number of small savings schemes to individual investors.

9. The market where in new securities are being issued in lieu of each from an investor is called as _____ market.

10. _____ issue is an official invitation given by the company to its shareholders regarding the subscription for the purchase of further shares issued by a company.

ANSWERS

1. Investment

2. Financial

3. Financial

4. Call money

5. Treasury

6. Speculator

7. Risk

8. Government of India

9. Primary

10. Rights

Very Short Questions and Answers

1. Define investment.

Ans :

Investment means "sacrificing the present value of money for future benefits".

2. Independent Investments.

Ans :

Independent investments meet the requirements of different proposals and do not strive with each other.

3. Medium-term securities.

Ans :

Medium-term securities are those which have a maturity period ranging between one and five years. E.g., Debentures maturing within a period of 5 years.

4. Financial Services.

Ans :

The term "Financial Services" in a broad sense means "mobilizing and allocating savings". Thus, it includes all activities involved in the transformation of saving into investment.

5. Speculation.

Ans :

Speculation is the buying, holding, and selling of stocks, commodities, currencies, collectibles, real estate, or any valuable thing to profit from fluctuations in its price as opposed to buying it for use or for income - dividends, rent etc.

Portfolio Analysis: Risk and Return Analysis, Markowitz Portfolio Theory, Mean – Variance Approach, Portfolio Selection, Efficient Portfolios, Single Index Model, Capital Asset Pricing Model, Arbitrage Pricing Theory.

2.1 CONCEPT OF PORTFOLIO MANAGEMENT

Q1. Define portfolio and portfolio management. Explain the objectives of portfolio management.

Ans :

Meaning

(i) Portfolio

Portfolio means a collection or combination of financial assets or securities such as shares, debentures and govt securities. The term portfolio may be used synonymously with expression collection of assets, Which can even include physical assets such as gold, silver, Real estates etc.,

(ii) Portfolio Management

Portfolio Management guides the investor in a method of selecting the best available securities that will provide the expected rate of return for any given degree of risk and also to mitigate (reduce) the risks. It is a strategic decision which is addressed by the top-level managers.

Objectives

1. Security of Principal Investment

Investment safety or minimization of risks is one of the most important objectives of portfolio management. Portfolio management not only involves keeping the investment intact but also contributes towards the growth of its purchasing power over the period.

2. Consistency of Returns

Portfolio management also ensures to provide the stability of returns by reinvesting the same earned returns in profitable and good portfolios. The portfolio helps to yield steady returns. The

earned returns should compensate the opportunity cost of the funds invested.

3. Capital Growth

Portfolio management guarantees the growth of capital by reinvesting in growth securities or by the purchase of the growth securities. A portfolio shall appreciate in value, in order to safeguard the investor from any erosion in purchasing power due to inflation and other economic factors.

4. Marketability

Portfolio management ensures the flexibility to the investment portfolio. A portfolio consists of such investment, which can be marketed and traded. Suppose, if your portfolio contains too many unlisted or inactive shares, then there would be problems to do trading like switching from one investment to another.

5. Liquidity

Portfolio management is planned in such a way that it facilitates to take maximum advantage of various good opportunities upcoming in the market. The portfolio should always ensure that there are enough funds available at short notice to take care of the investor's liquidity requirements.

6. Diversification of Portfolio

Portfolio management is purposely designed to reduce the risk of loss of capital and/or income by investing in different types of securities available in a wide range of industries. The investors shall be aware of the fact that there is no such thing as a zero risk investment. More over relatively low risk investment give correspondingly a lower return to their financial portfolio.

7. Favorable Tax Status

Portfolio management is planned in such a way to increase the effective yield an investor gets from his surplus invested funds. By minimizing the tax burden, yield can be effectively improved. A good portfolio should give a favorable tax shelter to the investors. The portfolio should be evaluated after considering income tax, capital gains tax, and other taxes.

Q2. Explain the Process of Portfolio Management.

Ans :

The Process of Portfolio Management includes the following steps.

(a) Specification of Investment Objectives, Constraints and Investment Policies

The first step in the process of portfolio management is to define the objectives of the investor in terms of return requirements and risk tolerance. Clearly, the objectives have to be framed in the context of constraints such as liquidity, time horizon, tax status and legal or regulatory considerations. Given the set of investment objectives and constraints, the investment policy for the investor is evolved. The investment policy specifies the actions to be taken to achieve the investment objectives within the constraints imposed.

(b) Forecasting Exceptional Inputs

This step involves forecasting measures of risk and return for the major asset classes like equities, bonds, money market securities and real estate.

The step begins with the identification of the macro economic variables that are relevant for assessing the risk return characteristics of each asset class and forming expectations about these variables. It culminates in translating the expectations into measures of risk and return.

(c) Asset Allocation

Given an investment policy and the expectational inputs, decisions have to be made regarding.

1. The key asset classes in which funds can be invested equities, bonds, money market instruments, real estate, etc.

2. The amount of money to be invested in each asset class. Within each asset class, decisions are made concerning,

   i) The securities that must belong to the class

   ii) The amount of money to be invested in each one of these securities.

Ideally, the portfolio must be a minimum variance portfolio. A portfolio that carries the minimum level of risk for a given level of return.

(d) Managing the Portfolio

Having constructed a portfolio, the next step will be to manage the portfolio using active or passive or a combination of active and passive strategies. One can think about these styles of portfolio management as lying along a spectrum of risk taking with all portfolio managers along that spectrum having defined benchmarks.
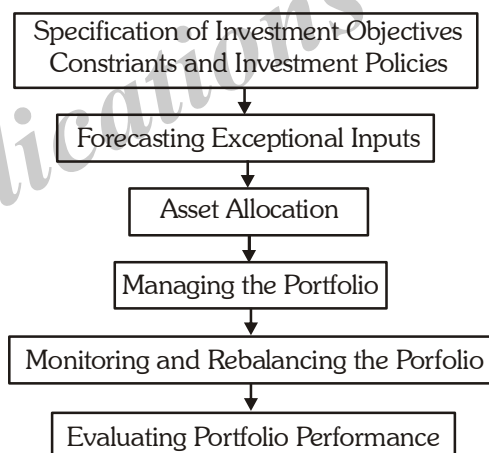
Fig. : Process of Portfolio Management

The passive portfolio manager takes little, if any, risk vis-a-vis that benchmark. His sole objective is to equal the return of the benchmark.

On the other hand, the active portfolio manager does take risk in terms of market timing and stock selection because only by taking risk one can hope to add incremental return.

(e) Monitoring and Rebalancing the Portfolio

Regardless of the strategy followed for managing the portfolio (active/passive), the portfolio manager must ensure that the portfolio remains appropriate to the ever changing environment.

The factors that can change include changes in the investment objectives and constraints,

changes in the risk attributes or return prospects for individual investments and emergence of new investment alternatives.

The portfolio manager must monitor these changes and respond by rebalancing the portfolio to accommodate these changes.

(f)   Evaluating Portfolio Performance

This step involves measuring the risk adjusted performance of a portfolio in order to evaluate the investment strategy that has been developed based on investor objectives. While, there are a number of risk adjusted performance measures available for evaluating the performance of a portfolio.

Q3.   Explain the benefits of Portfolio Management.

Ans :

Following are the benefits of Portfolio Management.

1.   Investors make informed decision

Portfolio management is very important when it comes to investing to ascertain that investors make informed decisions based on all the risk factors. When investors learn how to control risks in their business portfolios, they often feel contented. A portfolio management service is therefore beneficial to investors as it helps them make informed decisions.

2.   Improves business performance

Portfolio management facilitates good corporate and project governance as it uses performance and corporate resources against key objectives. In addition to that, it helps to improve business performance by handling the priorities for better project delivery.

3.   Equitable use of resources

Programs and business projects are often achieved by resources which are evenly shared alongside other project duties. Moreover, multiple projects may end up competing for resources. This is where portfolio management comes in handy, to help in planning so that resources are equitably distributed in all business processes.

4.   Align objectives with goals

When you learn the importance of portfolio management, it will become easier to handle management issues since it helps improve your communication skills in order to ensure that projects are delivered on time. It will also show you the steps to take if the firm's objectives were to change, keeping you informed on how to improve your business.

5.   Monitors all business processes

The main advantage of portfolio management is the fact that it helps companies manage all their processes, including personnel issues, finances, as well as set objectives.

Small businesses may not have a structure for portfolio management, but most companies often appoint someone to handle their projects.

Q4.   Explain the construction of Optimum Portfolio.

Ans :

(i)   Portfolio optimization refers to the selection of a specific portfolio which involves low risk with specified rate of return or specified risk with high returns.

(ii)   For instance, four portfolios comprising same amount of investment, P, Q, R and S. From these four portfolios first three has same rate of return 12% [P, Q, R] varies with risk involved in it 0.5 percent m P, 0.8 percent in Q and 1.2 percent tn R. The portfolio S has higher rate of return i.e., 15 percent and rate of risk is same as R i.e., 1.2 percent.
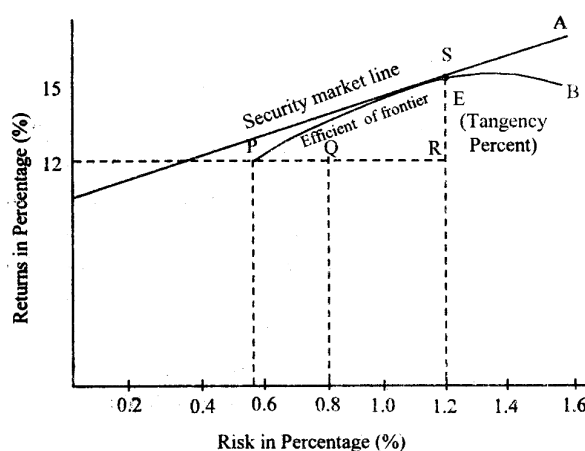
Fig. : An Optimal Portfolio

(iii) Among the portfolios P, Q, R whose rate of return is same i.e., 12%, P is an efficient portfolio since, it is associated with low degree of risk.

(iv) Portfolio 'S'is also an efficient portfolio because the rate of risk is 1.2 percent similar to portfolio R. "tine of efficient frontier" will be formulated by joining the percents P and S which highlight "efficient portfolios".

(v) As represented in the diagram, portfolio P is more efficient compared to P and S lesser risk and greater returns involved in this portfolio, but investor cannot acquire it as it has low amount to be invested.

(vi) Rest of the portfolios are not much effective, since, either the risk is more or the return is less, investor is required to select efficient portfolio (the optimal portfolio) among the groups of securities with the help of an efficient frontier based on the security market line which is drawn by combining both risk less security and the portfolio of risky security (SML) (A).

(vii) Thus, optimal portfolio is identified at the tangent (E) drawn between the security market line (A) and the line of efficient frontier (B).

2.2 RISK AND RETURN ANALYSIS

Q5. Define risk ? Explain the nature and scope of risk.

Ans :

Meaning

(i) Risk

Risk is virtually anything that threatens or limits the ability of a community or nonprofit organisation to achieve its mission. It can be unexpected and unpredictable events such as destruction of a building, the wiping of all your computer files, loss of funds through theft or an injury to a member or visitor who trips on a slippery floor and decides to sue.

(ii) Risk Management

Risk management is a process of thinking systematically about all possible risks, problems or disasters before they happen and setting up procedures that will avoid the risk, or minimise its impact, or cope with its impact. It is basically setting up a process where you can identify the risk and set up a strategy to control or deal with it.

Nature and Scope of Risk

All organisations deal with risks, though the nature and magnitude may differ for each type of organisation. This is especially true for banks / financial institutions, as they deal with money. They act as financial intermediaries in any economic system. They help in mobilising household / corporate savings and making them available to deficit units. In their role as financial intermediaries, banks and financial institutions are involved in the following activities which results in various types of risks.

(a) Funds mobilisation

Funds are mobilised by accepting term deposits as well as by allowing customers to operate their checking accounts by leaving balances in them.

(b) Funds deployment

The funds that are mobilised are first subject to regulatory investment requirements i.e., banks have to invest a specified proportion of their funds in certain instruments, often government securities. The surplus funds are available as loans for various segments of corporate and retail borrowers.

(c) Funds transfer

Banks and financial institutions are key vehicles for moving funds on behalf of their customers. Banks acts as settlement agents for their corporate clients in the realization and payment of their funds.

(d) Risk transfer

Manufacturing and other companies are exposed to a number of risks. Some of the risks are central to their business. The risk that arise from the financial markets should transfer to the Banks, since if is the latter's core competence to handle them.

(e) Transaction services

Banks assist their customers in carrying out various trade transactions, both domestic and international. International transactions involves dealing with multiple currencies. The global network of the banking system and its relationship constitute the backbone of such trade.

(f)　Credit enhancement services

In the course of trade, the concerned parties may not be familiar with each other. Therefore, the suppliers of goods often expect the bank's help in evaluating or enhancing the credit worthiness of a customer.

Q6.　Explain the various sources of Risk.

Ans :

Variety of sources lead towards risk and have an impact on the value of assets of a firm. The risk arises when the actual outcome is believed to be different from the expected outcome. The expected outcome depends upon various factors. Governments play a vital role and have a direct impact on the expected outcomes.

The factors or sources of risk are as follows :

1. The government policies related to prices and economy is one of the major sources of risk.

2. Consumer preference, consumption and savings habit are essential in deciding the market share. Therefore, is a source of risk.

3. The political, social, racial and ethnimic issue also have an impact on expected outcome.

4. Technological factors are responsible for the introduction of new products in the market and therefore has an impact on expected outcomes.

5. Corporate governance and financial performance and financial structure adopted by the firm also has an impact on expected performance.

Apart from there risks a firm also faces market risk. The following are the different sources of market risk.

1.　Price Level Risk

The price level risk refers to the change in the level of foreign exchange rates, interest rates, commodity rates and equity prices. This one of the major sources of market risk.

2.　Foreign Exchange Rate Risk

The cash flow expected from a portfolio in foreign currency is always subjected to foreign exchange rate risk. Fluctuations or change in exchange rates directly have an impact on expected cash flows.

3.　Interest Rate Risk

The change in the interest rates has an impact on fixed income securities. The forward and future contracts are also subjected to interest rate risk. Therefore, interest rate risk is also a major source of market risk.

4.　Correlation and Concentration Risk

The equity risk management is divided into two activities. Firstly, managing over all market risk, secondly, managing risk in individual equities. This uses factor models for yield curve analysis and is comparatively easier than variance- covariance matrix.

5.　Dividend and Stock Loan Risk

The cost of borrowing the two deliverables is used to determine the forward price. The forward equity price is affected by the cash flows that are expected to be paid before forward rate.

6.　Index Bench marking Risk

The banks have an absolute return on equity and profit and loss are managed in relation to the fixed budget. Its participants have a return target which is variable and has relation to the return on an index.

7.　Price Volatility Risk

Change in price volatility has an impact on VaR option of products. The volatility of prices exposure is handled as the exposure to prices. Change in price leads to change in price volatility.

8.　Price Correlation Risk

In 1990s, the market witnessed the risk faced by products whose payoffs depended upon more than one underlying price. Even today there are options that are dependend upon two or more prices. Therefore, price correlation risk is also one of the sources of market risk.

9.　Prepayment Variance Risk

This risk is faced by Mortgage-Back-Securities (MBS) and Asset Backed Securities (ABS). The investor of securities sells the borrower the option to payoff their debt early. A fall in rate enables the house owners to refinance and the MBS principal is paid back to the investor which the MBS investors is to reinvest at a rate lower than the MBS coupon rate.

Q7. Explain the concept of Risk and Return.

Ans :

1. Risk

(i) Risk means the uncertainty (or) probability that the actual outcome of an investment may be different from the desired outcome.

(ii) In other words, risk refers to the variability in returns from a security. Basically, the investors concentrate more on actual outcomes which is less than the expected outcomes the range of potential outcome is wide then the risk will also be high.

(iii) Risk emerges from many sources and among them, the three important sources are business risk, interest rate risk and market risk. The modem portfolio theory expressed total risk as,

> Total risk = Unique risk + Market risk

(iv) Unique risk is a part of total risk which arises from some specific factors of the 'firm, such as labour strike, development of new product or entry of new competitor. It is also called as diversifiable risk or unsystematic risk.

(v) Market risk is a part of total risk which is related with economy-wide factors such as growth rated GDP, money supply, inflation rate and interest rate structure. It is also called as systematic risk or non-diversifiable risk.

(vi) The most common measure of risk of a security is the standard deviation and variance of returns.

(vii) Standard deviation (commonly denoted as σ) of returns measures the extent of deviation of returns from the average value of return. The square of standard deviation is called variance and commonly denoted as cr.

The variance is computed as follows,

Variance, σ^2,

$$= P_1 (r_1 - \bar{r})^2 + P_2 (r_2 - \bar{r})^2 + \ldots + P_n(r_n - \bar{r})^n$$

And $\sigma = \sqrt{\text{Variance}}$

Risk is associated with uncertainty. For taking an investment decision two things are taken account by an investor i.e., the return from them vestment made and the risk taken for getting that return. The risk can be huge or low as it depends upon the investment made

because for having good return there will be possibility that the risk linked with that investment proposal could be high.

2. Return

The term "return" from an investment refers to the benefits from that investment. In the field of finance in general and security analysis in particular, the term return is almost invariably associated with a percentage (say, return on investment of 12%) and not a more amount (like, profit of ₹ 150).

In security analysis we are primarily concerned with return from investor's perspective. Our main concern is to compute the return for an investor from a particular investment say, a share or a debenture or some other financial instrument.

(i) Single Period Returns

It refers to a situation where an investor is concerned with return from a single period (say, one day, one week, one month or one year etc).

(ii) Multi-Period Returns

It refers to a situation when more than a single period returns are under consideration. Investor is concerned with computing the return per period, over a longer period.

(iii) Ex-Post Returns

Ex-post returns refer to the actual returns obtained from the investments. They properly measure the returns generated by an investment, one must consider both the price change and cash flow derived from the investment during the period it was held.

The measurement of returns from the historical data can be referred to ex-post returns. This includes both current income and capital gains (or losses) brought about by the appreciation (or depreciation) of the price of the security. The income and capital gains price of the security. The income and capital gains are then expressed as a percentage of the initial investment.

(iv) Ex-Ante Returns

The majority of investors tends to emphasize the returns they expect from a security while making investment decision and the expected return of a security. This enables investor to look into future prospects from an investment and the measurement of return from expectations of benefits is known as ex-ante returns.

The equations for quantifying the return, variance and standard deviation of individual security returns for both ex-post and ex-ante data are summarized in the following table,

Historical(Ex-post)	Expected(Ex-ante)
Arithmetic mean return	Expected return
$\overline{r_1} = \dfrac{1}{n}\sum\limits_{r=1}^{n} r_{if}$	$E(r_1) = \sum\limits_{S=1}^{n} r_{is} P_s$
Variance (Risk)	Variance (Risk)
$\sigma_1^2 = \dfrac{1}{n-1}\sum\limits_{i=1}^{n}(r_{it} - \overline{r_p})^2$	$\sigma_1^2 = \sum\limits_{S=1}^{n}[r_{is} - \overline{r_1}]^2 . P_s$
Standard deviation	Standard deviation
$\sigma_i = \sqrt{\dfrac{1}{n-1}\sum\limits_{i=1}^{n}(r_{it} - \overline{r_1})^2}$	$\sigma_i = \sqrt{\sum\limits_{S=1}^{n}[r_{is} - \overline{r_1}]^2 . P_s}$

Q8.   Explain the measure of risk and return of portfolio.

Ans :

Risk is defined as variability of return from a portfolio. The variability of return is measured with variance and standard deviation.

The variance of returns for a portfolio of assets can be calculated with the following general formula,

$$\sigma_p^2 = \sum_{i=1}^{n}\sigma_{ii}W_i^2 + \sum_{i=1}^{n}\sum_{j=1}^{n}\sigma_{ij}W_iW_j$$

Where, W_i and W_j are the weights for assets i and j, σ_{ij} is the variance for the ith asset, σ_{ij} is the covariance of assets i and j and n denote number of assets.

The square root of the variance is the portfolio's standard deviation of returns (σ_p).

The portfolio standard deviation of X and Y is,

$$= \sqrt{\sigma_X^2 W_X^2 + \sigma_\gamma^2 W_\gamma^2 + 2\rho_{XY}\sigma_X\sigma_Y W_X W_Y}$$

1.   Portfolio Return

The return on a portfolio is simply the weighted average return, a portfolio return can be calculated with the following equation,

$$r_p = \sum_{i=1}^{n} W_i r_i$$

Where,

W_i is the weight of asset i and

r_i is the return for asset i.

2.   Two-Asset Case

The objective of forming portfolio is to maximize return and minimise risk. The parameter of covariables correlation defines the movement of return on assets comprising the portfolio along with direction of such a movement inversely co-related returns tends to reduce risk.

The correlation between two assets are, three +1 or 0 or – 1.

If it is perfectly positive correlation i.e.,

$\rho = +1$ we can change the above formula.

When,

$p_{ij} = +1$

$\sigma_p = \sqrt{\sigma_i^2 W_i^2 + \sigma_j^2 W_j^2 + 2\rho_{ij}\sigma_i\sigma_j W_i W_j}$

Let,

$\sigma_i W_i = a$

$\sigma_i W_j = b = \sqrt{a^2 + b^2 + 2ab}$

$\sigma_i = \sqrt{(a+b)^2} = a + b$

$\sigma_i = \sigma_i W_i + \sigma_j W_j$

When,

$\rho_{ij} = -1$

Let, $\sigma_i W_i = a$

$\sigma_j W_j = b$

$\sigma_p = \sqrt{(a-b)^2} = a - b$

$\sigma_p = \sigma_i W_i - \sigma_j W_j$

When,

$\rho_{ij} = 0$

$\sigma_p = \sqrt{\sigma_i^2 W_i^2 + \sigma_j^2 W_j^2}$

The risk and return of a portfolio consisting of two assets A and B with equal weights can be computed as follows,

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43

n-Asset Case

A portfolio formed with three or more securities can be evaluated in terms of return and risk in the following manner,

Portfolio Return

$r_p = r_1 W_1 + r_2 W_2 + r_3 W_3 + ... + r_n W_n$

Where, r_1 ..., r_n....are returns on securities 1, 2,..., ns and

W_1, W_2,..., W_n are weights of securities in the portfolio.

Portfolio Risk

$$\sigma_p = \left[\sigma_1^2 W_1^2 + \sigma_2^2 W_2^2 + ... + w_n^2 W_n^2 + 2\rho_{12} W_1 W_2 \sigma_1 \sigma_2 . 2\rho_{13} W_1 W_3 \sigma_1 \sigma_3 + ... + 2\rho_{(n-1)n} W_{n-1} W_n \sigma_{n-1} \sigma_n \right]^{1/2}$$

Q9.   Explain the measurement of portfolio risk.

(OR)

What is Beta and how can you measure risk through Beta?

Ans :   **(Dec.-19, Imp.)**

Measurement of Risk in Portfolio Context

(i)   According to portfolio theory, the total risk (variance) is not the relevant risk in the portfolio context because the riskiness of a security when held in isolation is not same as the riskiness of a portfolio of securities.

(ii)   The risk or variability in the profits of a firm is caused by factors to an industry (business risk) as well as by factors those are specific to a firm (firm specific risk) in that industry.

(iii)   However, business and firm specific risk is to be viewed in terms of unsystematic and systematic risks.

(iv)   Unsystematic risk is the extent of variability in the securities return on account of the firm specific risk factors.

(v)   This is diversifiable or avoidable because it is possible to eliminate or diversify away this component of risk to a considerable extent by investing in a large portfolio of securities.

(vi)   The unsystematic risk stems from managerial inefficiency, technological change in the production processes, labour problems etc., the nature and magnitude of those factors differ from one company to another.

(vii)   Systematic risk affects the entire market. It arise from the factors which are beyond the control of the corporate and the investor. They cannot be entirely avoided by the investor and so can also be termed as non-diversifiable risk.

(viii) Hence, no amount of diversification can make a portfolio totally free from such risk. Therefore, this level of systematic risk below which riskiness of a portfolio cannot be reduced is also called as unavoidable risk.

Risk Reduction by Diversification

Further, from the point of view of an investor whose portfolio is well diversified, the diversifiable risk is of no importance as it gets eliminated but non-diversifiable risk arising from market wide movements of security prices is highly important.

This vulnerability is measured by the sensitivity of the return of the security vis-a-vis the market return and is denoted by Greek letter Beta (β).

Number of securities in the portfolio
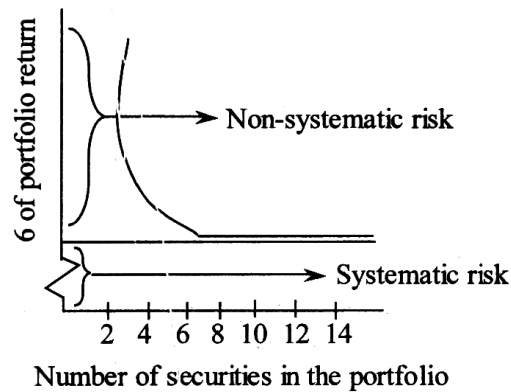
1. Beta (β)

It is frequently referred to as the measure of a security's systematic risk or market risk, since it indicates the manner in which a security's returns changes systematically with the changes in the market returns. The higher the value of the P, the higher the riskiness of a security.

A β2 implies that, if the market return increases or decreases by 1% over a period, the security return increases or decreases respectively by 2%.

The beta of a portfolio can be estimated as a weighted average of the betas of the individual securities in the portfolio.

$$\beta = \sum_{i=1}^{n} \beta_i W_i$$
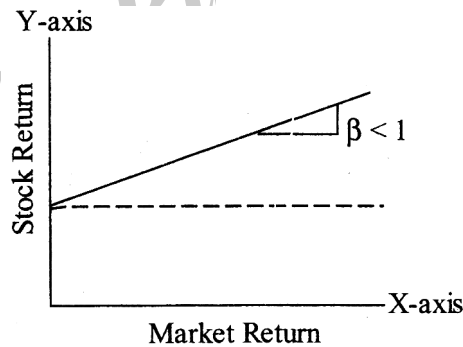
Fig. : Systematic Risk is Same as Market

The ex-post beta is calculated using historical data by the following equation,

$$\beta_1 = \frac{\left(N\sum_i r_i r_m\right) - \left(\sum_i r_m\right)\left(\sum_i r_j\right)}{\left(N\sum r_m^2\right) - \left(\sum_i r_m\right)} \text{ or } \frac{C_{OV_{im}}}{\sigma_m^2}$$

Where, $COV_{im} = \dfrac{\sum_{i=1}^{n}(r_{it} - \overline{r_i})(r_{ml} - \overline{r_m})}{n}$
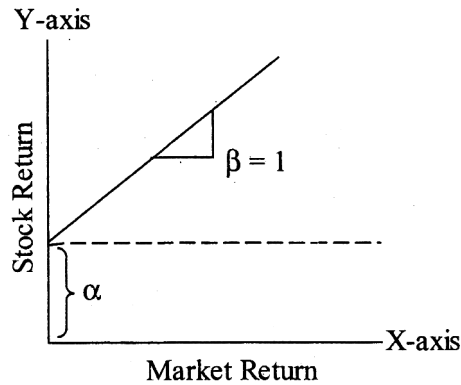
Fig. : High Systematic Risk

The security return on any day is defined as today's return.

$$h_i = \frac{\text{Today's price} - \text{Yesterday's price}}{\text{Yesterday's price}}$$

Similarly, the market return ori any day is defined as today market return.

$$r_m = \frac{\text{Today's index} - \text{Yesterday's index}}{\text{Yesterday's index}}$$

Like daily returns, weekly or monthly returns can also be calculated. The characteristic regression line or CRL ' a simple linear regression model estimated for a particular stock against the market index return to measure diversifiab' risk and non-diversifiable risk.

The model is as follows.

$$r_i = \alpha_i + \beta_i r_m + e_i$$

Where,

r_i = Return of the ith stock

α_i = Intercept (i.e., the stock's independence of the market return)

β_i = Systematic risk of ith stock

r_m = Return of the market-index and

e_i = Error item
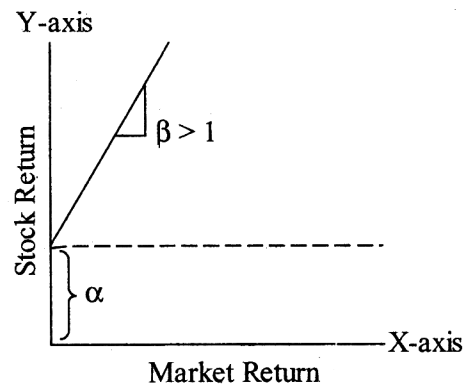
Fig. : Low Systematic Risk

46

Here α_i (alpha coefficient) measures the i'h assets rate of return when the market return (r_m) is equal to zero.

It indicates that the stock return is independent of the market return. In a well diversified portfolio the average value of alpha of all stocks turns on to be zero.

PROBLEMS

1. **Rahul Ltd. has a portfolio of five stocks with the following expected market values and returns.**

Stocks	Market value (Rs.)	Return (%)
Ace	40,000	8
Bell	50,000	20
Crown	20,000	15
Dell	1,00,000	9
Egan	30,000	12
	2,40,000	

Determine Rahul Ltd's expected portfolio return.

Sol :

Calculation of Portfolio Return

Stock	Market value (Rs.)	Weights (W_i)	$r_i(\%)$	$w_i \times r_i$
Ace	40,000	$\dfrac{40,000}{2,40,000} = 0.167$	8	1.34
Bell	50,000	$\dfrac{50,000}{2,40,000} = 0.208$	20	4.16
Crown	20,000	$\dfrac{20,000}{2,40,000} = 0.083$	15	1.25
Dell	1,00,000	$\dfrac{1,00,000}{2,40,000} = 0.417$	9	3.75
Egam	30,000	$\dfrac{30,000}{2,40,000} = 0.125$	12	1.50
	2,40,000			12.00

Portfolio Return

$$r_p = \sum_{t=1}^{N=5} w_i r_i = 12.00\%$$

2.   A Bank is managing a Portfolio of Stocks with the following Market Values and Betas (βi). Find the Beta of the Portfolio:

Stocks	P1	P2	P3	P4	P5
Market Value (Rs.)	1,00,000	2,00,000	3,00,000	2,50,000	1,50,000
Betas (βi)	1.1	1.6	0.8	1.2	2.0

Sol :   **(April-22, Dec.-19, Imp.)**

Calculation of weights (W_1) of each security in the portfolio,

$$= \frac{\text{Market value of each portfolio}}{\text{Sum of portfolio}}$$

Sum of portfolios   = 1,00,000 + 2,00,000 + 3,00,000 + 2,50,000 + 1,50,000 = 10,00,000

$$Wp_1 = \frac{1,00,000}{10,00,000} = 0.10$$

$$Wp_2 = \frac{2,00,000}{10,00,000} = 0.20$$

$$Wp_3 = \frac{3,00,000}{10,00,000} = 0.30$$

$$Wp_4 = \frac{2,50,000}{10,00,000} = 0.25$$

$$Wp_5 = \frac{1,50,000}{10,00,000} = 0.15$$

Calculation of beta of the Portfolio, $\beta p = Wp_1\ \beta p_1 + Wp_2\ \beta p_2 + Wp_3\ \beta p_3 + Wp_4\ \beta p_4 + Wp_5\ \beta p_5$

$= (0.10 \times 1.1) + (0.20 \times 1.6) + (0.30 \times 0.80) + (0.25 \times 1.2) + (0.15 \times 2.0)$

$= 0.11 + 0.32 + 0.24 + 0.30 + 0.30$

$= 1.27$

$\therefore \quad \beta p = 1.27$

3.   A company manages a stock fund consisting of fund stocks with the following market values and betas.

Stock	Market value	Beta
P	1,00,000	1.10
Q	50,000	1.20
R	75,000	0.75
S	1,25,000	0.80
T	1,50,000	1.40
	5,00,000	

Calculate beta of the portfolio.

Sol :

Calculation of Beta of the Portfolio

Stock	Market value (Rs.)	Weights (W$_i$)	r$_i$(%)	w$_i$ × r$_i$(β$_i$)
P	1,00,000	$\dfrac{1,00,000}{5,00,000} = 0.20$	1.10	0.2200
Q	50,000	$\dfrac{50,000}{5,00,000} = 0.10$	1.20	0.1200
R	75,000	$\dfrac{75,000}{5,00,000} = 0.15$	0.75	0.1125
S	1,25,000	$\dfrac{1,25,000}{5,00,000} = 0.25$	0.80	0.2000
T	1,50,000	$\dfrac{1,50,000}{5,00,000} = 0.30$	1.40	0.4200
	5,00,000			1.0725

$$\therefore \beta_p = \sum_{t=1}^{N} N_i \beta_i \quad [\because N = 5]$$

$$= 1.0725 \times 5 = 5.3625$$

4. **The estimates of the standing deviation and correlation co-efficient for three stock are given below.**

Stock	Standard deviation	Correlation with Stock		
		A	B	C
A	32	1.00	– 0.80	0.40
B	26	– 0.80	1.00	0.65
C	18	0.40	0.65	1.00

If a portfolio is constructed with 15% of stock A, 50% of stock B and 35% of stock C. What is the portfolios standard deviation ?

Ans :   **(May-19, Imp.)**

In the given problem, the covariance between securities are not given. However, the convariance between two securities are indicated as the product of correlation between two securities and standard deviation of two securities. i.e.,

$$\sigma_{ij} = r_{ij} \, \sigma_i \, \sigma_j$$

The below table shows the variance covariance matrix

Weight	Security	A (0.15)	B (0.50)	C (0.35)
0.15	A	$1.00 \times 32 \times 32 = 1024$	$-0.80 \times 26 = -665.6$	$0.40 \times 32 \times 18 = 230.4$
0.50	B	$-0.80 \times 26 \times 32 = -665.6$	$1.00 \times 26 \times 26 = 676$	$0.65 \times 26 \times 18 = 304.2$
0.35	C	$0.40 \times 18 \times 32 = 230.4$	$0.65 \times 18 \times 26 = 304.2$	$1.00 \times 18 \times 18 = 324$

$\sigma_p^2 =$ $(0.15 \times 0.15 \times 1024) + (0.15 \times 0.50 \times 0.50 \times -665.6) + (0.15 \times 0.35 \times 230.4) +$

$(0.50 \times 0.15 \times -665.6) + (0.50 \times 0.50 \times 676.0) + (0.50 \times 0.35 \times 304.2) +$

$(0.35 \times 0.15 \times 230.4) + (0.35 \times 0.50 \times 304.2) + (0.35 \times 0.35 \times 324)$

$= 23.04 + (-49.92) + 12.10 + (-49.92) + 169 + 53.24 + 12.10 + 53.24 + 39.69$

$\sigma_p^2 = 262.57$

∴ The portfolio standard deviation is,

$\sigma_p = \sqrt{262.57}$

$\sigma_p = 16.20$

5. **The following information is available in respect of security X and Y.**

Security	Beta	Expected Returns
X	1.8	22.00%
Y	1.6	20.40%

If the risk free rate is 7%, are these securities correctly priced? What the risk free rate has to be if they are correctly priced?

Sol :

(Aug.-21, Imp.)

Calculation of Reward to Risk ratio of x.

Reward to Risk ratio $= \dfrac{E(R_i) - R_i}{\beta_i}$

Where,

$R_i = 22\%$, $R_f = 7\%$, $\beta_i = 1.8$

$= \dfrac{22\% - 7\%}{1.8} = \dfrac{15\%}{1.8} = 8.33\%$

Calculation of Reward to Risk ratio of Y.

Reward to Risk Ratio $= \dfrac{E(R_i) - R_f}{\beta_i}$

Where

$$R_i = 20.44\%, \ R_f = 7\%, \ \beta_i = 1.6$$

$$= \frac{20.44\% - 7\%}{1.6}$$

$$= \frac{13.44\%}{1.6} = 8.4\%$$

If they are correctly priced, their reward to risk ratio will be same. This can be done by determining risk free rate of both the securities from reward to risk ratio formula

$$= \frac{E(R_i) - R_f}{\beta_i}$$

$$= \frac{22 - R_f}{1.8} = \frac{20.44 - R_f}{1.6}$$

$$1.6 \ (22 - R_f) = 1.8 \ (20.44 - R_f)$$

$$35.2 - 1.6 \ R_f = 36.792 - 1.8 \ R_f$$

$$1.8 \ R_f - 1.6 \ R_f = 36.792 - 35.2$$

$$0.2 \ R_f = 1.592$$

$$R_f = \frac{1.592}{0.2} = 8\%$$

$\therefore$ The risk free rate of x and y securities is 8%

6. **Following data relates to two securities i and j**

Security	Expected return (%)	Risk in (%)
i	9%	7.56
j	8%	3.75

If $\rho \ (I, j)$ is – 0.5 and the proportion of investment 28% and 72% in i and j securities find out

(a) Return on port folio

(b) Risk on port folio

Sol:

Given

$$\overline{R}_i = 9\% \qquad \Sigma_i = 7.56$$

$$\overline{R}_j = 8\% \qquad \Sigma_j = 3.75$$

$\rho\ (i,\ j)\ =\ -0.5$

$W_i = 28\%\ \text{or}\ .028$

$W_j = 72\%\ \text{or}\ 0.72$

Calculating Return Portfolio

$\overline{R}_P = 9\ (0.28) + 8\ (0.72)$

$= 2.52 + 5.76$

$\overline{R}_P = 8.28\%$

Calculating Risk on Portfolio when coefficient of correlation is given

$$\sigma_P = \sqrt{\sigma_i^2 w_i^2 + \sigma_j^2 w_j^2 + 2\rho(i,j)\,\sigma_i \sigma_j w_i w_j}$$

$$\sigma_P = \sqrt{(7.56)^2 (0.28)^2 + (3.75)^2 (0.72)^2 + 2(-0.50)(7.56 \times 3.75)(0.28 \times 0.72)}$$

$$\sigma_P = \sqrt{(57.1536)(0.0784) + (14.0625)(0.5184) + 2(-0.50)(28.35)(0.2016)}$$

$$\sigma_P = \sqrt{4.48 + 7.29 + (-1)(5.72)}$$

$$\sigma_P = \sqrt{4.48 + 7.29 - 5.72}$$

$$\sigma_P = \sqrt{11.77 - 5.72}$$

$$\sigma_P = \sqrt{6.05}$$

$$\sigma_P = 2.46\%$$

7. **Compute Risk on port folio from the following information**

Securities	Standard deviation	Proportion
A	0.2	20%
B	0.3	20%
C	0.5	60%

Co-Variance

$\text{Cov (AB)} = 0.03$

$\text{Cov (AC)} = 0.01$

$\text{Cov (BC)} = -0.045$

Sol :

Calculating Risk on Portfolio (σ_P). Co-variance is given

$$\sigma_P = \sqrt{\sigma_A^2 w_A^2 + \sigma_B^2 w_B^2 + \sigma_C^2 w_C^2 + 2\text{Cov}(A,B)w_A w_B + 2\text{Cov}(B,C)w_B w_C + 2\text{Cov}(A,C)w_A w_C}$$

$$\sigma_p = \sqrt{(0.2)^2(0.2)^2 + (0.3)^2(0.2)^2 + (0.5)^2(0.6)^2 + 2(0.03 \times 0.2 \times 0.2) + 2(0.01 \times 0.2 \times 0.6) + 2(-0.045 \times 0.2 \times 0.6)}$$

$$\sigma_p = \sqrt{0.04 \times 0.04 + 0.09 \times 0.04 + 0.25 \times 0.36 + 2(0.0012) + 2(0.0012) + 2(-0.0054)}$$

$$\sigma_p = \sqrt{0.0016 + 0.0036 + 0.09 + 0.0024 + 0.0024 - 0.0108}$$

$$\sigma_p = \sqrt{0.1 - 0.0108}$$

$$\sigma_p = \sqrt{0.0892}$$

$$\sigma_p = 0.2987 \text{ (or) } 29.87\%$$

8. **Calculate risk Return of port folio. Using the following data**

Security	A	B	C
Expected Return	10%	12%	8%
Standard deviation	10%	15%	5%
Investment	20%	40%	40%

Co – relation Matrix

	A	B	C
A	1	0.3	0.5
B	-	1	0.4
C	-	-	1

Sol :

Given

$$P_{AB} = 0.3$$
$$P_{AB} = 0.5$$
$$P_{AB} = 0.4$$

Calculating Return

$$\overline{R}_P = 10 \times 0.20 + 12 \times (0.40) + 8(0.40)$$

$$\overline{R}_P = 2 + 4.8 + 3.2$$

$$\overline{R}_P = 10$$

$$\sigma_P = \sqrt{\sigma_A^2 w_A^2 + \sigma_B^2 w_B^2 + \sigma_A^2 w_A^2 + 2.P_{AB}\sigma_A\sigma_B w_A w_B + 2.P_{AC}\sigma_A\sigma_C w_A w_C + 2.P_{BC}\sigma_B\sigma_C w_B w_C}$$

$$\sigma_P = \sqrt{\begin{array}{l}(0.10)^2(0.2)^2 + (0.15)^2(0.40)^2 + (0.05)^2(0.40)^2 + 2(0.3)(0.10)(0.15)(0.20)(0.40) \\ + 2(0.5)(0.10)(0.05)(0.2)(0.4) + 2(0.4)(0.15)(0.05)(0.40)(0.40)\end{array}}$$

$$\sigma_P = \sqrt{\begin{array}{l}(0.01)(0.04) + (0.0225)(0.16) + (0.0025)(0.16) + 2(0.3)(0.015)(0.018) \\ + 2(0.5)(0.005)(0.08) + 2(0.4)(0.0075)(0.16)\end{array}}$$

$$\sigma_P = \sqrt{0.01(0.04) + 0.0225(0.16) + 0.0025(0.16) + 0.048 + 0.08 + 0.128}$$

$$\sigma_P = \sqrt{0.0004 + 0.0036 + 0.0004 + 0.266}$$

$$\sigma_P = \sqrt{0.2604}$$

$$\sigma_P = 0.51 \text{ or } 51\%$$

9. **Find out risk and return for the following two securities R and P in different conditions of the market.**

Market conditions	Return of security P	Return of security R	Probability
Bull	**25%**	**40%**	**0.3**
Normal	**20%**	**10%**	**0.5**
Bear	**15%**	**20%**	**0.2**

Sol :   **(April-23, Imp.)**

(i) **Return of Security P**

Weighted average return is used to measure the expected return from the security and the risk is measured in standard deviation (σ).

The calculation of expected return and risk for security P is as follows:

Market conditions	Return	Probability	Return × Probability	P (Return – Average)²
Bull	25%	0.3	0.075	$0.3(.25–0.205)^2 = 0.0006$
Normal	20%	0.5	0.100	$0.5(.20–0.205)^2 = 0.00001$
Bear	15%	0.2	0.030	$0.2(.15–0.205)^2 = 0.0006$
			0.205	0.00121

Therefore, average expected return

= 0.205 or 20.5%

$$\sigma = \sqrt{0.00121}$$

$$= (0.00121)^{1/2}$$

$$= 0.035 \text{ or } 3.5\%$$

(ii) **Return of Security R**

The calculations of expected return and risk for security R is as follows,

Market conditions	Return	Probability	Return × Probability	P (Return – Average)²
Bull	40%	0.3	0.12	$0.3(.40–0.21)^2 = 0.011$
Normal	10%	0.5	0.05	$0.5(.10–0.21)^2 = 0.006$
Bear	20%	0.2	0.04	$0.2(.20–0.21)^2 = 0.00002$
			0.21	0.01702

Therefore, the expected return

$$= 0.21 \text{ or } 21\%$$

Standard deviation (σ)

$$\sigma = \sqrt{0.01702} \ (0.01702)^{1/2}$$

$$= 0.13 \text{ or } 13\%.$$

2.3 Markowitz Portfolio Theory

Q10. What is Markowitz Model ? Explain its assumptions and limitations.

Ans :

Harry Markowitz opened new vistas to modern portfolio selection by publishing an article in the Journal of Finance in March 1952. His publication indicated the importance of correlation among the different stocks' returns in the construction of a stock portfolio. Markowitz also showed that for a given level of expected return in a group of securities, one security dominates the other. To find out this, the knowledge of the correlation coefficients between all possible securities combinations is required.

After the publication of his paper, numerous investment firms and portfolio managers developed "Markowitz algorithms" to minimise portfolio variance i.e. risk. Even today the term Markowitz diversification is used to refer to the portfolio construction accomplished with the help of security covariances.

Markowitz Portfolio Selection Method identifies an investor's unique risk-return preferences, namely utilities.

Assumptions

The Markowiz model is based on several assumptions regarding investor behavior.

Markowitz theory is based on the modern portfolio theory under several assumptions. The assumptions are :

(a) The market is efficient and all investors have in their knowledge all the facts about the stock market and so an investor can continuously make superior returns.

(b) All investors before making any investments have a common goal. This is the avoidance of risk because they are risk averse.

(c) All investors would like to earn the maximum rate of return that they can achieve from their investments.

(d) The investors base their decisions on the expected rate of return of an investment.

(e) Markowitz brought out the theory that it was a useful insight to find out how the security returns are correlated to each other. By combining the assets in such a way that they give the lowest risk, maximum returns could be brought out by the investor.

(f) Every investor assumes that while making an investment, he will combine his investments in such a way that he gets a maximum return and is surrounded by minimum risk.

(g) The investor assumes that greater or larger the return that he achieves on his investments, the higher the risk factor that surrounds him. On the contrary, when risks are low, the return can also be expected to be low.

(h) The investor can reduce his risk if he adds investments to his portfolio.

Limitations

The following are the limitations of Markowitz model,

1. An investor or financial expert must try toget estimates of return, variances of return and covariances of returns for securities in the portfolio. This model requires a very large amount of input data.

2. Markowitz model has an assumption that aH rational investors are actually risk averters, which may not be true. As a result, investors will not have any diminishing marginal utility of wealth.

3. Markowitz model requires a numerous and complex calculations.

4. Portfolio alterations are required to achieve a constant portfolio efficiency which is another complex aspect. This can also give rise to large and uneconomic transactions.

5. Money is considered as a limited resource with alternative uses, for lending and borrowing unlimited amounts at risk free rates may not be possible and is not authentic/actual in real world.

2.3.1 Mean Variance Approach

Q11. Discuss in detail about Mean Variance Approach.

Ans :   *(April-23, Imp.)*

(i)   In 1952, Markowitz introduced mean variance analysis which is essential for both finance researchers and practitioners, theory enables to solve the problems relating to optional portfolio selection.

(ii)   Mean variance analysis is the process of weighing risk which is referred as variance against expected return. It helps the investors in making decisions relating to financial instruments in which they invest depending on level of risk and rewards.

(iii) It also enable the investors to determine maximum reward at given level of risk or minimum risk at given level of return.

(iv)   Mean variance analysis constitutes a part of modern portfolio theory which believes that if investors possess complete information then they will make rational decisions relating to investments. Mean variance analysis involves two important parts i.e., variance and expected return.

(v)   Variance refers to spreading of returns of a specific security on daily or weekly basis.

(vi)   The expected return is a probability which express the estimated return of investment in the security.

(vii) If two securities have same expected return but variance is less for one security then security with less variance must be selected. In the same way, if securities have same variance but different return then security with higher return must be selected.

(viii) In modern portfolio theory, an investor will be choosing different securities to make investments in different levels of variance and expected return.

2.4 PORTFOLIO SELECTION

2.4.1 Efficient Portfolios

Q12. Explain briefly about feasible set-of portfolio and efficient set-of portfolio.

Ans :

I)   Feasible Set of Portfolios

With a limited number of securities an investor can create a very large number of portfolios by combining these securities in different proportions. These constitute the feasible set of portfolios in which the investor can possibly invest. This is also known as the portfolio opportunity set.

Each portfolio in the opportunity set is characterised by an expected return and a measure of risk, viz., variance or standard deviation of returns. Not every portfolio in the portfolio opportunity set is of interest to an investor. In the opportunity set some portfolios will obviously be dominated by others. A portfolio will dominate another if it has either a lower standard deviation and the same expected return as the other, or a higher expected return and the same standard deviation as the other. Portfolios that are dominated by other portfolios are known as inefficient portfolios. An investor would not be interested in all the portfolios in the opportunity set. He would be interested only in the efficient portfolios.

II)   Efficient Set of Portfolios

To understand the concept of efficient portfolios, let us consider various combinations of securities and designate them as portfolios 1 to n. The expected returns of these portfolios may be worked out. The risk of these portfolios may be estimated by measuring the standard deviation of portfolio returns. The table below shows illustrative figures for the expected returns and standard deviations of some portfolios.

Portfolio Number	Expected return (per cent)	Standard deviation (Risk)
1	5.6	4.5
2	7.8	5.8
3	9.2	7.6
4	10.5	8.1
5	11.7	8.1
6	12.4	9.3
7	13.5	9.5
8	13.5	11.3
9	15.7	12.7
10	16.8	12.9

If we compare portfolio nos. 4 and 5, for the same standard deviation of 8.1 portfolio no. 5 gives a higher expected return of 11.7, making it more efficient than portfolio no. 4. Again, if we compare portfolio nos. 7 and 8, for the same expected return of 13.5 per cent, the standard deviation is lower for portfolio no. 7, making it more efficient than portfolio no. 8. Thus, the selection of portfolios by the investor will be guided by two criteria:

1. Given two portfolios with the same expected return, the investor would prefer the one with the lower risk.

2. Given two portfolios with the same risk, the investor would prefer the one with the higher expected return.

These criteria are based on the assumption that investors are rational and also risk-averse. As they are rational they would prefer more return to less return. As they are risk averse, they would prefer less risk to more risk.

The concept of efficient sets can be illustrated with the help of a graph. The expected return and standard deviation of portfolios can be depicted on an *XY* graph, measuring the expected return on the Y axis and the standard deviation on the X axis. Figure depicts such a graph.

As each possible portfolio in the opportunity set or feasible set of portfolios has an expected return and standard deviation associated with it, each portfolio would be represented by a single point in the risk-return space enclosed within the two axes of the graph. The shaded area in the graph represents the set of all possible portfolios that can be constructed from a given set of securities. This opportunity set of portfolios takes a concave shape because it consists of portfolios containing securities that are less than perfectly correlated with each other.

Let us closely examine the diagram in Figure Consider portfolios F and E. Both the portfolios have the same expected return but portfolio £ has less risk. Hence, portfolio *E* would be preferred to portfolio F. Now consider portfolios C and E. Both have the same risk, but portfolio *E* offers more return for the same risk. Hence, portfolio F would be preferred to portfolio C. Thus, for any point in the risk-return space, an investor would like to move as far as possible in the direction of increasing returns and also as far as possible in the direction of decreasing risk. Effectively, he would be moving towards the left in search of decreasing risk and upwards in search of increasing returns.
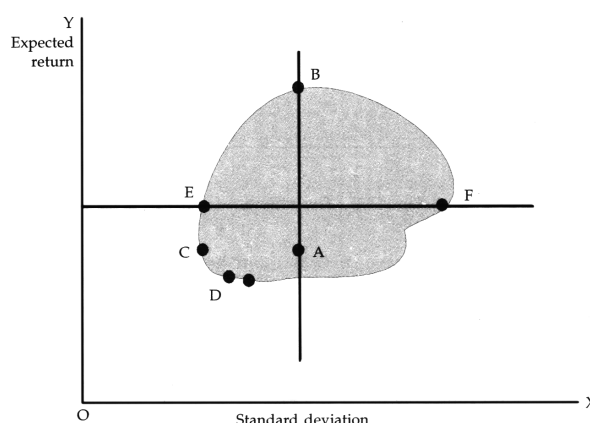
Fig.: Feasible set of portfolios

Let us consider portfolios C and *A*. Portfolio C would be preferred to portfolio *A* because it offers less risk for the same level of return. In the opportunity set of portfolios represented in the diagram, portfolio C has the lowest risk compared to all other portfolios. Here portfolio C in this diagram represents the global minimum variance portfolio.

Comparing portfolios A and B, we find that portfolio B is preferable to portfolio A because it offers higher return for the same level of risk. In this diagram, point B represents the portfolio with the highest expected return among all the portfolios in the feasible set.

Thus, we find that portfolios lying in the north west boundary of the shaded area are more efficient than all the portfolios in the interior of the shaded area. This boundary of the shaded area is called the Efficient Frontier because it contains all the efficient portfolios in the opportunity set. The set of portfolios lying between the global minimum variance portfolio and the maximum return portfolio on the efficient frontier represents the efficient set of portfolios. The efficient frontier is shown separately in Figure.
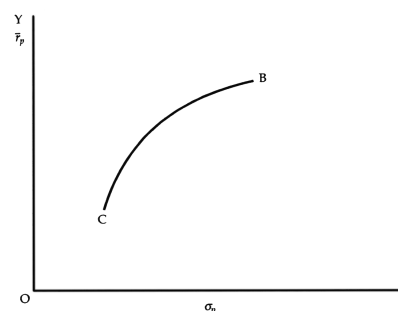
Fig.: The Efficient Frontier

The efficient frontier is a concave curve in the risk-return space that extends from the minimum variance portfolio to the maximum return portfolio.

Q13. Write about Selection of Optimal Portfolio.

Ans :

The portfolio selection problem is really the process of delineating the efficient portfolios and then selecting the best portfolio from the set.

Rational investors will obviously prefer to invest in the efficient portfolios. The particular portfolio that an individual investor will select from the efficient frontier will depend on that investor's degree of aversion to risk. A highly risk averse investor will hold a portfolio on the lower left hand segment of the efficient frontier, while an investor who is not too risk averse will hold one on the upper portion of the efficient frontier.

The selection of the optimal portfolio thus depends on the investor's risk aversion, or conversely on his risk tolerance. This can be graphically represented through a series of risk return utility curves or indifference curves. The indifference curves of an investor are shown in Figure. Each curve represents different combinations of risk and return all of which are equally satisfactory to the concerned investor. The investor is indifferent between the successive points in the curve. Each successive curve moving upwards to the left represents a higher level of satisfaction or utility. The investor's goal would be to maximise his utility by moving upto the higher utility curve. The optimal portfolio for an investor would be the one at the point of tangency between the efficient frontier and his risk-return utility or indifference curve.

The point O' represents the optimal portfolio.
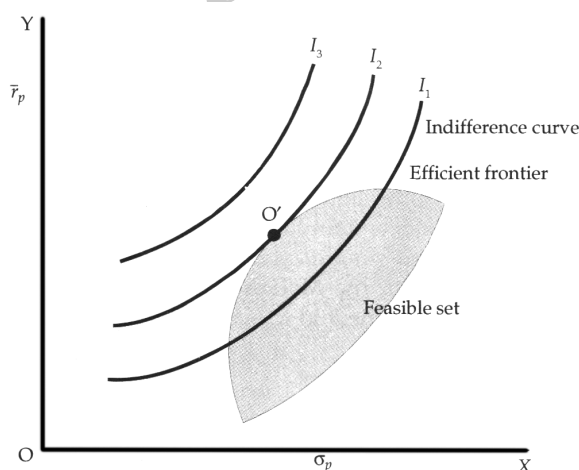
Fig.: Optimal Portfolio

Markowitz used the technique of quadratic pro-

gramming to identify the efficient portfolios. Using the expected return and risk of each security under consideration and the covariance estimates for each pair of securities, he calculated risk and return for all possible portfolios. Then, for any specific value of expected portfolio return, he determined the least risk portfolio using quadratic programming. With another value of expected portfolio return, a similar procedure again gives the minimum risk portfolio. The process is repeated with different values of expected return, the resulting minimum risk portfolios constitute the set of efficient portfolios.

The selection of a portfolio depends on the objectives of the investor. These are discussed below:

1.   Objectives and Asset Mix

If the main goal is ensuring adequate current income, then 60 per cent of the investment is on debt instruments and 40 per cent on equities. The proportions of investments in debt and equities will differ according to the individual's preferences. Money will be invested in short-term debt and fixed-income securities.

2.   Growth of Income and Asset Mix

Here, the investor looks for a certain percentage of growth in income from his investment. The investor's portfolio may consist of 60-100 per cent equities and 0-40 per cent debt instruments. The debt portion of the portfolio may consist of investments entitled to tax exemptions.

3.   Capital Appreciation and Asset Mix

Capital appreciation means that the value of the original investment increases over the years. Investment in real estate may provide a faster rate of capital appreciation, but it lacks liquidity. In the capital market, values of shares are much higher than their original issue prices.

4.   Safety of the Principal and Asset Mix

Usually, risk-averse investors are highly particular about the stability of the principal. According to the life cycle theory, people in the third stage of life give more weight to the safety of principal. All investors have this objective. No one wants to lose his money invested in different assets.

5.   Risk and Return Analysis

The traditional approach to portfolio building is based on some basic assumptions. First, an in-

dividual prefers larger to smaller returns from securities. An investor has to take risks to achieve this goal. The ability to achieve high returns depends on his ability to assess risks and take risks. These risks are interest rate risk, purchasing power risk, financial risk and market risk.

6. Diversification

Once the asset mix is determined, and the risks and returns are analysed, the final step is the diversification of the portfolio. Financial risks can be minimized by commitments to top-quality bonds, but these securities offer limited resistance to inflation. Stocks provide more inflation protection than bonds but are more vulnerable to financial risks. Good quality convertibles may balance financial risk and purchasing power risk.

2.5 SINGLE INDEX MODEL

Q14. Discuss briefly about sharpe's single index model.

(OR)

Explain single index model.

Ans :   (April-23, May-19, Imp.)

The basic notion underlying the single index model is that all stocks are affected by governments in the stock market. Casual observation of share prices reveals that when the market moves up (as measured by any of the widely used stock market indices), prices of most shares tend to increase. When the market goes down, the prices of most shares tend to decline. This suggests that one reason why security returns might be correlated and there is co-movement between securities, is because of a common response to market changes. This co-movement of stocks with a market index may be studied with the help of a simple linear regression analysis, taking the returns on an individual security as the dependent variable (R,) and the returns on the market index (R_m) as the independent variable.

The return of an individual security is assumed to depend on the return on the market index. The return of an individual security may be expressed as:

$$R_i = \alpha_j + \beta_j R_m + e_i$$

where

α_i = Component of security i's return that is independent of the market's performance.

R_m = Rate of return on the market index.

β_i = Constant that measures the expected change in R, given a change in R_m.

e_t = Error term representing the random or residual return.

This equation breaks the return on a stock into two components, one part due to the market and the other part independent of the market. The beta parameter in the equation, P_i, measures how sensitive a stock's return is to the return on the market index. It indicates how extensively the return of a security will vary with changes in the market return.

Measuring Security Return and Risk under Single Index Model

Using the single index model, expected return of an individual security may be expressed as:

$$\overline{R}_i = \alpha_i + \beta_i \overline{R}_m$$

The return of the security is a combination of two components: (a) a specific return component represented by the alpha of the security; and (b) a market related return component represented by the term $\beta_i \overline{R}_m$. The residual return disappears from the expression because its average value is zero, i.e. it has an expected value of zero.

Correspondingly, the risk of a security of becomes the sum of a market related component and a component that is specific to the security. Thus,

Total risk = Market related risk + Specific risk

$$\sigma_i^2 = \beta_i^2 \sigma_m^2 + \sigma_{ei}^2$$

where

σ_i^2 = Variance of individual security.

σ_m^2 = Variance of market index returns.

σ_{ei}^2 = Variance of residual returns of individual security.

β_i = Beta coefficient of individual security.

The market related component of risk is referred to as systematic risk as it affects all securities. The specific risk component is the unique risk or unsystematic risk which can be reduced through diversification. It is also called diversifiable risk.

2.6 CAPITAL ASSET PRICING MODEL

Q15. Define Capital Asset Pricing Model. Explain its assumptions.

(OR)

Describe the important aspects of Capital Asset pricing model.

(OR)

What are the assumptions of CAPM Model ?

Ans : **(Nov.-20, Dec.-19, Dec.-18, Imp.)**

Meaning

The CAPM was developed to explain how risky securities are priced in market and this was attributed to experts like sharpe and Linter. Markowitz theory being more theoretical, CAPM aims at a more practical approach to stock valuation. It is no doubt based on the mean-variance approach to risk for assessment of investment as developed by Markowitz. It explains the behavioral pattern of investors in building up portfolios. It is based on economic model. It aims the investor at maximizing the utility of wealth.

The capital asset pricing model is a relationship explaining how assets should be priced in the capital markets. It reveals the relationship between the expected return, unavoidable risk and the valuation of securities. The unavoidable risk means, the risk which cannot be avoided by diversification. If a security does not provide adequate returns, then the security will not favour the investor. The CAPM is build upon the Markovitz Portfolio Model and capital market line.

Assumptions

The capital asset pricing model is based on certain explicit assumptions regarding the behaviour of investors. The assumptions are listed below:

1. Investors make their investment decisions on the basis of risk-return assessments measured in terms of expected returns and standard deviation of returns.

2. The purchase or sale of a security can be undertaken in infinitely divisible units.

3. Purchases and sales by a single investor cannot affect prices. This means that there is perfect competition where investors in total determine prices by their actions.

4. There are no transaction costs. Given the fact that transaction costs are small, they are probably of minor importance in investment decision-making, and hence they are ignored.

5. There are no personal income taxes. Alternatively, the tax rates on dividend income and capital gains are the same, thereby making the investor indifferent to the form in which the return on the investment is received (dividends or capital gains).

6. The investor can lend or borrow any amount of funds desired at a rate of interest equal to the rate for riskless securities.

7. The investor can sell short any amount of any shares.

8. Investors share homogeneity of expectations. This implies that investors have identical expectations with regard to the decision period and decision inputs. Investors are presumed to have identical holding periods and also identical expectations regarding expected returns, variances of expected returns and covariances of all pairs of securities.

It is true that many of the above assumptions are untenable. However, they do not materially alter the real world. Moreover, the model describes the risk return relationship and the pricing of assets fairly well.

Application

Capital Assets Pricing Model (CAPM) is widely used for evaluating investment projects because of its significant role,

1. CAPM is advantageous in evaluating the portfolio performance and cost of equity of the companies.

2. It assess the risk and helps in determining the relationship between the risk and expected return of the portfolio.

3. CAPM is future oriented model i.e., it helps in predicting the future returns of securities.

4. It is also used even if the dividend information is not provided.

Q16. What is capital market line theory of portfolio?

(OR)

Briefly explain the Capital Market Line (CML) Concept, with the diagram and the formulae.

Ans :   **(Dec.-19, Imp.)**

As seen previously, adjusting for the risk of an asset using the risk-free rate, an investor can easily alter his risk profile. Keeping that in mind, in the context of the capital market line (CML), the market portfolio consists of the combination of all risky assets and the risk-free asset, using market value of the assets to determine the weights. The CML line is derived by the CAPM, solving for expected return at various levels of risk.

Markowitz' idea of the efficient frontier, however, did not take into account the risk-free asset. The CML does and, as such, the frontier is extended to the risk-free rate as illustrated below:
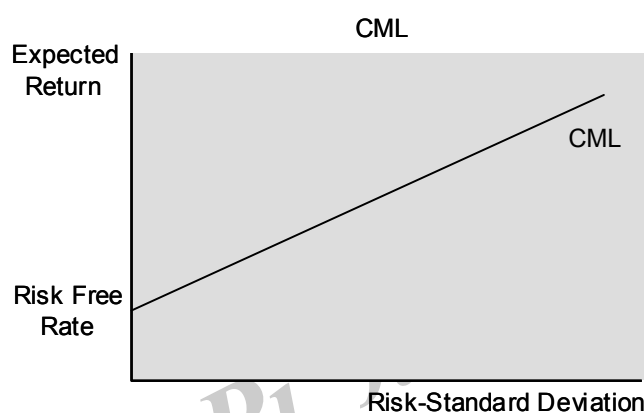
Systematic and Unsystematic Risk

Total risk to a stock not only is a function of the risk inherent within the stock itself, but is also a function of the risk in the overall market. Systematic risk is the risk associated with the market. When analyzing the risk of an investment, the systematic risk is the risk that cannot be diversified away.

Unsystematic risk is the risk inherent to a stock. This risk is the aspect of total risk that can be diversified away when building a portfolio.

> Formula : Total risk = Systematic risk + Unsyste-matic risk

When building a portfolio, a key concept is to gain the greatest return with the least amount of risk. However, it is important to note, that additional return is not guaranteed for an increased level of risk. With risk, reward can come, but losses can be magnified as well.

Q17. What is security market line theory of portfolio?

Ans :

The security market line (SML) is the line that reflects an investment's risk versus its return, or the return on a given investment in relation to risk. The measure of risk used for the security market line is beta.

The line begins with the risk-free rate (with zero risk) and moves upward and to the right. As the risk of an investment increases, it is expected that the return on an investment would increase. An investor with a low risk profile would choose an investment at the beginning of the security market line. An investor with a higher risk profile would thus choose an investment higher along the security market line.
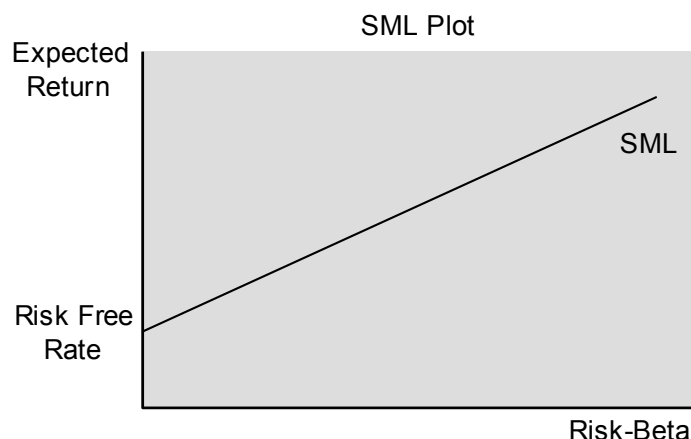
Fig.: Security Market Line

Given the SML reflects the return on a given investment in relation to risk, a change in the slope of the SML could be caused by the risk premium of the investments. Recall that the risk premium of an investment is the excess return required by an investor to help ensure a required rate of return is met. If the risk premium required by investors was to change, the slope of the SML would change as well.

When a shift in the SML occurs, a change that affects all investments' risk versus return profile has occurred. A shift of the SML can occur with changes in the following:

1.   Expected real growth in the economy.

2.   Capital market conditions.

3.   Expected inflation rate.

Q18. Discuss the Pricing of Securities with CAPM.

Ans :

The capital asset pricing model can also be used for evaluating the pricing of securities. The CAPM provides a framework for assessing whether a security is underpriced, overpriced or correctly priced. According to CAPM, each security is expected to provide a return commensurate with its level of risk. A security may be offering more returns than the expected return, making it more attractive. On the contrary, another security may be offering less return than the expected return, making it less attractive.

The expected return on a security can be calculated using the CAPM formula. Let us designate it as the theoretical return. The real rate of return estimated to be realised from investing in a security can be calculated by the following formula:

$$R_i = \frac{(P_1 - P_0) + D_1}{P_0}$$

where

P_0 = Current market price.

P_i = Estimated market price after one year.

D_1 = Anticipated dividend for the year.

This may be designated as the estimated return.

The CAPM framework for evaluation of pricing of securities can be illustrated with Figure.
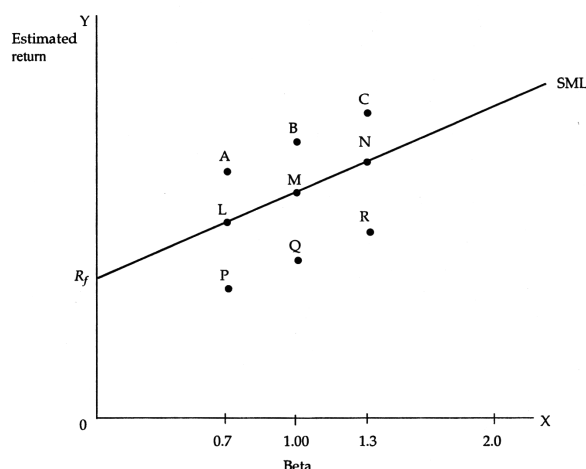
Fig.: CAPM and Security Valuation

Figure shows the security market line. Beta values are plotted on the X axis, while estimated returns are plotted on the Y axis. Nine securities are plotted on the graph according to their beta values and estimated return values.

Securities A, L and P are in the same risk class having an identical beta value of 0.7. The security market line shows the expected return for each level of risk. Security L plots on the SML indicating that the estimated return and expected return on security L is identical. Security A plots above the SML indicating that its estimated return is higher than its theoretical return. It is offering higher return than what is commensurate with its risk. Hence, it is attractive and is presumed to be underpriced. Stock P which plots below the SML has an estimated return which is lower than its theoretical or expected return. This makes it undesirable. The security may be considered to be overpriced.

Securities B, M and Q constitute a set of securities in the same risk class. Security B may be assumed to be underpriced because it offers more return than expected, while security Q may be assumed to be overpriced as it offers lower return than that expected on the basis of its risk. Security M can be considered to be correctly priced as it provides a return commensurate with its risk.

Securities C, N and R constitute another set of securities belonging to the same risk class, each having a beta value of 1.3. It can be seen that security C is underpriced, security R is overpriced and security N is correctly priced.

PROBLEMS

10.   An investor owns a portfolio composed of five securities with the following characteristics:

Security	Beta	Random error term standard deviation (per cent)	Proportion
1	1.35	5	0.10
2	1.05	9	0.20
3	0.80	4	0.15
4	1.50	12	0.30
5	1.12	8	0.25

If the standard deviation of the market index is 20 per cent, what is the total risk of the portfolio?

Sol :

The total portfolio risk may be expressed as:

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

where

β_p = Portfolio beta.

σ_m^2 = Variance of the market index.

W_i = Proportion of investment in each security.

σ_{ei}^2 = Residual variance (random error) of individual securities.

β_p or portfolio beta has to be calculated using the formula.

$$\beta_p = \sum_{i=1}^{n} w_i \beta_i$$

$= (0.1) (1.35) + (0.2) (1.05) + (0.15) (0.80) + (0.3) (1.5) + (0.25) (1.12)$

$= 1.195$

Portfolio residual variance $\left(\sum_{i=1}^{n} \omega_i^2 \sigma_{ei}^2 \right)$ can be calculated as:

$= (0.1)^2(5)^2 + (0.2)^2(9)^2 + (0.15)^2(4)^2 + (0.30)^2(12)^2 + (0.25)^2(8)^2 = 20.81$

Portfolio total risk can now be calculated as:

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

$= (1.195)^2(20)^2 + 20.81$

$= 571.21 + 20.81 = 592.02$

11. **B.V. prasad considering several investments the risk free rate of return is 6.75% and the expected return for the market is 12% what should be the required rates of return for each investment using the CAPM.**

Security	A	B	C	D	E
Beta	1.20	0.80	1.50	0.60	1.25

Sol :

r_f = 6.75

Rm = 12

Security A

$\bar{r}_p = T + \beta(R_m - T)$

$= 6.75 + 1.20 (12 - 6.75)$

$= 6.75 + 1.20 (5.25)$

$= 6.75 + 6.30 = 13.05\%$

Security B

$\bar{r}_p$ = 6.75 + 0.80 (12 - 6.75)

   = 6.75 + 0.80 (5.25)

   = 6.75 + 4.0 = 10.95%

Security C

$\bar{r}_p$ = 6.75 + 1.50 (12 - 6.75)

   = 6.75 + 1.50 (5.25)

   = 6.75 + 7.87 = 14.62%

Security D

$\bar{r}_p$ = 6.75 + 0.60 (12 - 6.75)

   = 6.75 + 0.60 (5.25)

   = 6.75 + 3.15 = 9.9%

Security E

$\bar{r}_p$ = 6.75 + 1.25 (12 - 6.75)

   = 6.75 + 1.25 (5.25)

   = 6.75 + 6.6 = 13.35% .

12. **David's portfolio consists of an investment in risky portfolio with a 12% expected return and 25% standard deviation and a risk free asset with 7% return. If David's total portfolio has a 20% standard deviation, what is its expected returns?**

Sol : (Aug.-21, Imp.)

$$R_e = R_f + \frac{R_m - R_f}{\sigma_m} - \sigma_e$$

R_f = 7%, R_m = 12%, σ_m = 25%, σ_e = 20%

$$R_e = 7 + \frac{12 - 7}{25} \times 20$$

   7 + (0.2 × 20)

   7 + 4 = 11%.

13. **Given r_f = 6%, $\bar{r}_m$ = 15% and expected returns and expected betas are as follows,**

Stock	Expected returns	Expected betas
A	14%	1.20
B	15	0.75
C	13	1.50
D	20	1.60
E	10	0.80

Which stock is overvalued and which is undervalued, relative to expected return?

Sol :

According to CAPM model,

$$\bar{r_i} = r_f + \beta_i(\bar{r_m} - r_f)$$

(i) $\bar{r_B}$ = 6 + 1.20(15 – 6)

       = 6 + 10.8 = 16.8% (overvalued)

(ii) $\bar{r_B}$ = 6 + 0.75 (15 – 5)

       = 6 + 6.75 = 12.75% (undervalued)

(iii) $\bar{r_C}$ = 6 + 1.50(15 – 6)

       = 6 + 13.5 = 19.5% (overvalued)

(iv) $\bar{r_D}$ = 6 + 1.60(15 – 6)

       = 6 + 14.4 = 20.4% (overvalued)

(v) $\bar{r_E}$ = 6 + 0.80 (15 – 6)

       = 6 + 7.2 = 13.2% (overvalued).

14.   **Assume yourself as portfolio manager and with the help of the following details, find out the securities that are overpriced and underpriced in terms of SML.**

Security	Expected Return	β	α
A	0.33	1.70	0.50
B	0.13	1.40	0.35
C	0.26	1.10	0.40
D	0.12	0.95	0.24
Nifty index	0.13	1.00	0.20
T-bills	0.09	0.00	0.00

Sol :

The return on the SML can be estimated with the help of the following formula of CAPM,

$$r_i = r_f = \beta_i(r_m - r_f)$$

So, estimated return for security A will be,

$r_A = r_f + \beta_A(r_m - r_f)$

     = 0.09 + 1.7(0.13-0.09)

     = 0.158

$r_B = r_f + \beta_A(r_m - r_f)$

     = 0.09 + 1.40(0.13 – 0.09)

     = 0.09 + 1.40 (0.04)

     = 0.09 + 0.05 = 0.146

$r_C = 0.09 + 1.10(0.13 - 0.09)$

$= 0.09 + 1.10(0.04)$

$= 0.09 + 0.044 = 0.134$

$r_D = 0.09 + 0.95(0.13 - 0.09)$

$= 0.09 + 0.09(0.04)$

$= 0.09 + 0.038$

$= 0.128$

Security return	Expected return	Estimated	Remarks
A	0.33	0.158	Underpriced
B	0.13	0.146	Overpriced
C	0.26	0.134	Underpriced
D	0.12	0.128	Overpriced

2.7 ARBITRAGE PRICING THEORY

Q19. Explain the concept of Arbitrage Pricing Theory.

(OR)

Discuss in detail the theory of Arbitrage Pricing.

Ans :   (Nov.-20, Imp.)

Arbitrage Pricing for One Risk Factor

The one factor model is equivalent to the Capital Ass, Pricing Model (CAPM), λ_0 is equal to the risk-free rate (R_f) However, the assumptions of the two models differ. Both models assume investors as,

1.   Prefer more wealth to less,

2.   Are risk-averse,

3.   Have homogeneous expectations and

4.   That capital markets are perfect.

However, the APT, unlike the CAPM, does not assume,

1.   A one-period horizon,

2.   Returns are normally distributed,

3.   A particular type of utility function,

4.   A market portfolio, or

5.   That the investor can borrow or lend at the risk fro. rate.

The one assumption unique to the APT is that unrestricted short selling exists. The utopian situation < available to only a few (such as investment bankers and stock exchange specialists) in today's financial markets.

The arbitrage pricing line for one risk factor can be written as,

$\overline{r_i} = \lambda_0 + \lambda_i \beta_i$

Where,

$\bar{r}_i$ = The expected return on security i

λ_0 = The return for a zero beta portfolio

β_1 = The sensitivity of the ith asset to the risk factor

λ_1 = The factors risk premium.

Two Factor Arbitrage Pricing

The two-factor model describes the returns of i^1 security as follows,

$$\bar{r}_i = \lambda_0 + \lambda_1\beta_{i1} + \lambda_2\beta_{i2}$$

Where, λ_2 is the risk premium associated with risk factor 2 and β_{i2} is the factor beta coefficient for factor 2 and factors 1 and 2 are uncorrelated.

PROBLEMS

15.   **Determine the present value of the following cash flow,**

Year	1	2	3	4	5
Cash flows (₹)	100	300	400	500	700

Assume the following two-factor model of APT applies.

$$\bar{r}_p = 3\% + 2\% \, P_M + 5\% \, \beta_{i2}$$

The relevant factor betas are,

$$\beta_{i1} = -0.75$$
$$\beta_{i2} = -0.50$$

Sol :

According to two-factor model of ATP, the required return is,

$\bar{r}_p$ = 3% + 2% (– 0.75) + 5% (1.5) = 9%

∴ Calculation of PV of cash flows is,

Year	CFS (₹)	PVIF @9%	PVs (₹)
1	100	0.9174	91.74
2	300	0.8417	252.51
3	400	0.7722	308.88
4	– 500	0.7084	– 354.20
5	700	0.6499	454.93
			PVCF = 753.86

Q20. Compare and Contrast arbitrage pricing theory and capital asset pricing model.

Ans :

S.No.	APT	S.No.	CAPM
1.	Investors do not look at expected returns and standard	1.	Investors look at the expected returns and deviations. accompanying measured by standard deviations.
2.	Investors prefer higher wealth/risk-return analysis.	2.	Investors are risk averse and returns to lower wealth.
3.	APT is based on the return generated by factor models.	3.	Investors maximise wealth for a given level of risk.

Short Questions and Answers

1. Objectives of Portfolio Management.

Ans :

(i) Security of Principal Investment

Investment safety or minimization of risks is one of the most important objectives of portfolio management. Portfolio management not only involves keeping the investment intact but also contributes towards the growth of its purchasing power over the period. The motive of a financial portfolio management is to ensure that the investment is absolutely safe. Other factors such as income, growth, etc., are considered only after the safety of investment is ensured.

(ii) Consistency of Returns

Portfolio management also ensures to provide the stability of returns by reinvesting the same earned returns in profitable and good portfolios. The portfolio helps to yield steady returns. The earned returns should compensate the opportunity cost of the funds invested.

2. Sources of Risk.

Ans :

i) The government policies related to prices and economy is one of the major sources of risk.

ii) Consumer preference, consumption and savings habit are essential in deciding the market share. Therefore, is a source of risk.

iii) The political, social, racial and ethnimic issue also have an impact on expected outcome.

3. Purchasing Power Risk.

Ans :

Purchasing power risk is also known as inflation risk. This risk arises out of change in the prices of goods and services and technically it covers both inflation and deflation periods. During the last two decades, it has been seen that inflationary have been continuously affecting the Indian economy. Therefore, in India purchasing power risk is associated with inflation and rising prices in the economy.

The consumers who wanted to forego their present consumption level to purchase commodities in future found that they could not adjust their budgets because they were faced with rising prices and shortage of funds for allocation according to their preferences.

4. Financial Risk.

Ans :

Financial risk in a company is associated with the method through which it plans its financial structure. If the capital structure of a company tends to make earnings unstable, the company may fail financially. How a company raises funds to finance its needs and growth will have an impact on its future earnings and consequently on the stability of earnings.

5. Ex-Ante Return.

Ans :

The term ex-ante is a neo-Latin word meaning "before the event". Ex-ante is used most commonly in the commercial world, where results of a particular action, or series of actions, are forecast in advance. The opposite of ex-ante is ex-post (or ex post).

The ex-ante return is the expected return of an investment portfolio that is calculated from a proportional weighting of the expected returns of its component assets. In calculating this return, the results assumed for each possible expected return must be calculated as accurately as possible in order for the ex-ante return to be close to the actual return.

6. Ex-Post Return.

Ans :

The historical returns or Ex-post returns are derived from the cash flow received as well as the price changes that occur during the period of holding the stock or any asset. The income flow is the dividend he receives during the holding period.

To find out the export or historical average return of the stock, the common arithmetic mean is used.

$$R = 1/n (r_1 + r_2 + r_3 + \ldots\ldots + r_n)$$

$r_1, r_2, r_3,$ indicate the returns that occur in different periods of the stock.

7.   Assumptions of Markotwiz Model.

Ans :

a)   The market is efficient and all investors have in their knowledge all the facts about the stock market and so an investor can continuously make superior returns.

b)   All investors before making any investments have a common goal. This is the avoidance of risk because they are risk averse.

c)   All investors would like to earn the maximum rate of return that they can achieve from their investments.

d)   The investor can reduce his risk if he adds investments to his portfolio.

8.   Mean Variance Approach.

Ans :

In 1952, Markowitz introduced mean variance analysis which is essential for both finance researchers and practitioners, theory enables to solve the problems relating to optional portfolio selection.

Mean variance analysis is the process of weighing risk which is referred as variance against expected return. It helps the investors in making decisions relating to financial instruments in which they invest depending on level of risk and rewards. It also enable the investors to determine maximum reward at given level of risk or minimum risk at given level of return.

9.   Feasible Set of Portfolios.

Ans :

With a limited number of securities an investor can create a very large number of portfolios by combining these securities in different proportions. These constitute the feasible set of portfolios in which the investor can possibly invest. This is also known as the portfolio opportunity set.

Each portfolio in the opportunity set is characterised by an expected return and a measure of risk, viz., variance or standard deviation of returns. Not every portfolio in the portfolio opportunity set is of interest to an investor. In the opportunity set some portfolios will obviously be dominated by others. A portfolio will dominate another if it has either a lower standard deviation and the same expected return as the other, or a higher expected return and the same standard deviation as the other. Portfolios that are dominated by other portfolios are known as inefficient portfolios. An investor would not be interested in all the portfolios in the opportunity set. He would be interested only in the efficient portfolios.

10.   Sharpe's single index model.

Ans :

The basic notion underlying the single index model is that all stocks are affected by governments in the stock market. Casual observation of share prices reveals that when the market moves up (as measured by any of the widely used stock market indices), prices of most shares tend to increase. When the market goes down, the prices of most shares tend to decline. This suggests that one reason why security returns might be correlated and there is co-movement between securities, is because of a common response to market changes. This co-movement of stocks with a market index may be studied with the help of a simple linear regression analysis, taking the returns on an individual security as the dependent variable (R_i) and the returns on the market index (R_m) as the independent variable.

The return of an individual security is assumed to depend on the return on the market index. The return of an individual security may be expressed as:

$$R_i = \alpha_j + \beta_j R_m + e_i$$

where

α_i = Component of security i's return that is independent of the market's performance.

R_m = Rate of return on the market index.

p_i = Constant that measures the expected change in R, given a change in R_m.

e_t = Error term representing the random or residual return.

11. Capital Asset Pricing Model.

Ans :

The CAPM was developed to explain how risky securities are priced in market and this was attributed to experts like sharpe and Linter. Markowitz theory being more theoretical, CAPM aims at a more practical approach to stock valuation. It is no doubt based on the mean-variance approach to risk for assessment of investment as developed by Markowitz. It explains the behavioral pattern of investors in building up portfolios. It is based on economic model. It aims the investor at maximizing the utility of wealth.

The capital asset pricing model is a relationship explaining how assets should be priced in the capital markets. It reveals the relationship between the expected return, unavoidable risk and the valuation of securities. The unavoidable risk means, the risk which cannot be avoided by diversification. If a security does not provide adequate returns, then the security will not favour the investor. The CAPM is build upon the Markovitz Portfolio Model and capital market line.

12. Assumptions of the CAPM.

Ans :

i) Investors make their investment decisions on the basis of risk-return assessments measured in terms of expected returns and standard deviation of returns.

ii) The purchase or sale of a security can be undertaken in infinitely divisible units.

iii) Purchases and sales by a single investor cannot affect prices. This means that there is perfect competition where investors in total determine prices by their actions.

13. Capital Market Line.

Ans :

As seen previously, adjusting for the risk of an asset using the risk-free rate, an investor can easily alter his risk profile. Keeping that in mind, in the context of the capital market line (CML), the market portfolio consists of the combination of all risky assets and the risk-free asset, using market value of the assets to determine the weights. The CML line is derived by the CAPM, solving for expected return at various levels of risk.

Markowitz' idea of the efficient frontier, however, did not take into account the risk-free asset. The CML does and, as such, the frontier is extended to the risk-free rate

14. Security Market Line (SML).

Ans :

The security market line (SML) is the line that reflects an investment's risk versus its return, or the return on a given investment in relation to risk. The measure of risk used for the security market line is beta.

The line begins with the risk-free rate (with zero risk) and moves upward and to the right. As the risk of an investment increases, it is expected that the return on an investment would increase. An investor with a low risk profile would choose an investment at the beginning of the security market line. An investor with a higher risk profile would thus choose an investment higher along the security market line.

15. Portfolio selection.

Ans :

The main aim of every investor is to increase returns and reduce risk. A diversification method is used to minimize risk. Diversification leads to construction of portfolios. The objective behind construction of portfolio is to generate a portfolio that gives high returns and low risk which is nothing but 'optional portfolio'. Portfolio selection is the process of finding an optimal portfolio.

16. What is systematic risk? What is unsystematic risk?

Ans :

The systematic risk is a result of external and uncontrollable variables, which are not industry or security specific and affects the entire market leading to the fluctuation in prices of all the securities.

On the other hand, unsystematic risk refers to the risk which emerges out of controlled and known variables, that are industry or security specific.

17. Efficient Set of Portfolios.

Ans :

To understand the concept of efficient portfolios, let us consider various combinations of securities and designate them as portfolios 1 to n. The expected returns of these portfolios may be worked out. The risk of these portfolios may be estimated by measuring the standard deviation of portfolio returns.

18. Explain the features of indifference curves.

Ans :

(i)   Indifference curve is pictorial representation of utility of an investment.

(ii)   Portfolios shown on indifference curve represent same level of utility.

(iii)   Indifference curves cannot intersect because investor consider all portfolios as equally desirable.

(iv)   Non satiation and risk aversion are the two assumptions which results in convex and positively sloped indifference curve.

Exercise Problems

1. Mr. A has identified two securities whose expected returns (%) over a period of next 10 years are as follows,

Year	1	2	3	4	5	6	7	8	9	10
Security	6	21	6	32	37	18	24	–7	18	–5
Y	1	18	10	30	32	27	29	–12	15	0

(i)   Expected return of both securities X and Y.

(ii) Standard deviations of both securities X and Y.

(iii) Expected return of the portfolios consisting of 100% of X, 60% of X, and 40% of Y and 100% of Y.

[Ans : (i) 15%, 15%, (ii) 14.0%, 14.3%, (iii) 15% in all cases]

2. An investor is contemplating the construction of a portfolio for which he has short-listed two securities X and Y. T expected return and standard deviation of these securities are as follows,

	Exp.Re turn	ST.Deviation
SecurityX	9%	2%
Y	9%	4%

Find out the expected returns and standard deviation of the following portfolios given that the correlation coefficie between X and Y is -1.

Security X	Security Y
100%	0%
80%	20%
66%	34%
22%	80%
0%	100%

[Ans : Expected returns are 9% in all cases. Standard deviations of different portfolios are 2, .8, 0, 2.8, 4.]

3. Find out portfolio return and risk from the following information:

	Security A	Security B	Security C
Expected Return	8	12	10
Standard Deviation	5	15	10

Coefficient of correlation : (1, 3) = .5, (2, 3) = .3, (1,2) = .4

[Ans : Return and variance are 10 and 64.8 respectively]

Choose the Correct Answers

1. Identify the uncontrollable risk of a company _____.   [c]

    (a) labour problem   (b) increase in loan service charges

    (c) cut in subsidy   (d) technological obsolescence

2. Interest rate risk occurs when _____.   [d]

    (a) the market price of bond moves inversely to the prevailing market interest rate

    (b) the variability in yield is due to the market interest rate fluctuations

    (c) there is variability in the coupon interest rates

    (d) all the above

3. The statistical tool used to measure a company's risk is _____.   [c]

    (a) mean   (b) mode

    (c) variance   (d) co-variance

4. The common practice in the traditional approach is to _____.   [c]

    (a) evaluate the entire stock market

    (b) maximize the expected return for a given level of risk

    (c) evaluate the entire financial plan of the individual

    (d) select the portfolios

5. The need for constant income depends on the _____.   [b]

    (a) market risk   (b) inflation risk

    (c) interest risk   (d) unique risk

6. A highly liquid security is a _____.   [b]

    (a) mutual fund unit   (b) treasury bill

    (c) share   (d) commercial paper

7. Individuals invest more in stocks _____.   [a]

    (a) early in their career   (b) during the mid-career period

    (c) at retirement when they have more funds   (d) all the above

8. An investor has a portfolio with the combination of stocks and bonds in the ratio of 75 : 25. He is _____.

                                                                                                [c]

    (a) risk averse   (b) risk neutral

    (c) risk taker   (d) active in portfolio management

9.   In the active approach, the investor continuously studies _____.   [d]

      (a)   group-related risk   (b)   market-related risk

      (c)   security-specific risk   (d)   all the above

10.   Diversification reduces _____.   [c]

      (a)   interest rate risk   (b)   market risk

      (c)   unique risk   (d)   inflation risk

11.   Simple diversification means _____.   [c]

      (a)   purchase of more than 15 stocks   (b)   purchase of treasury bills

      (c)   purchase of fewer than 15 stocks at random (d)   purchase of large varieties of assets

.

Fill in the blanks

1.   _____ means a collection or combination of financial assets or securities such as shares, debentures and govt securities.

2.   _____ management ensures the flexibility to the investment portfolio.

3.   _____ is virtually anything that threatens or limits the ability of a community or nonprofit organisation to achieve its mission.

4.   _____ are mobilised by accepting term deposits as well as by allowing customers to operate their checking accounts by leaving balances in them.

5.   _____ returns refer to the actual returns obtained from the investments.

6.   The term _____ from ari investment refers to the benefits from that investment.

7.   _____ Portfolio Selection Method identifies an investor's unique risk-return preferences, namely utilities.

8.   The _____ pricing model is a relationship explaining how assets should be priced in the capital markets.

9.   CML stands for _____.

10.   SML stands for _____.

ANSWERS

1.   Portfolio

2.   Portfolio

3.   Risk

4.   Funds

5.   Ex-post

6.   Return

7.   Markowitz

8.   Capital asset

9.   Capital Market Line

10.   Security Market Line

Very Short Questions and Answers

1.   Portfolio.

Ans :

Portfolio means a collection or combination of financial assets or securities such as shares, debentures and govt securities.

2.   Portfolio Management.

Ans :

Portfolio Management guides the investor in a method of selecting the best available securities that will provide the expected rate of return for any given degree of risk and also to mitigate (reduce) the risks. It is a strategic decision which is addressed by the top-level managers.

3.   Risk.

Ans :

Risk is virtually anything that threatens or limits the ability of a community or nonprofit organisation to achieve its mission. It can be unexpected and unpredictable events such as destruction of a building, the wiping of all your computer files, loss of funds through theft or an injury to a member or visitor who trips on a slippery floor and decides to sue.

4.   Risk Management.

Ans :

Risk management is a process of thinking systematically about all possible risks, problems or disasters before they happen and setting up procedures that will avoid the risk, or minimise its impact, or cope with its impact.

5.   Ex-Post Returns.

Ans :

Ex-post returns refer to the actual returns obtained from the investments. They properly measure the returns generated by an investment, one must consider both the price change and cash flow derived from the investment during the period it was held.

Bond Valuation: Classification of Fixed Income Securities, Types of Bonds, Interest Rates, Term Structure of Interest Rates, Measuring Bond Yields, Yield to Maturity, Yield to Call, Holding Period Return, Bond Pricing Theorems, Bond Duration, Modified Duration. Active and Passive Bond Management Strategies, Bond immunization, Bond Volatility, Bond Convexity.

3.1 CLASSIFICATION OF FIXED INCOME SECURITIES

Q1. Define fixed income securities. What are the different types of Fixed Income Securities?

Ans :

Meaning

It refers to securities such as debentures, saving certificates, bonds etc., which earns interest or divided at fixed rate for a stipulated period of time.

Types

The different type of fixed income securities that are available in India are as follows,

i) Bank Deposits

Deposits with banks are the safest mode of investment and earns a fixed rate of interest. Fixed deposits up to ₹ 1 lakh, in individual accounts covered by deposits insurance scheme.

They are highly liquid as fixed deposit receipts can be enhanced before maturity at a discount of 1% on interest. They are neither tradable nor transferable. Nomination facility is available.

ii) Company Deposits

These deposits are with manufacturing and non-banking financial companies and earns a fixed rate of interest usually higher than bank fixed deposits rate.

These deposits are neither secured nor guaranteed by RBI and noted for untimely payment of principal amount. They are not exactly liquid. These are neither tradeable nor transferable. They are without nomination facility.

iii) Small Saving Schemes

These are the safest means of investment and initial investment gets doubled in 5 - 6 years time. In section 88, they are not tradeable and most instruments are accepted by banks as collateral.

iv) Debentures and Bonds

These are long term debt instruments usually, yield high rate of interest. The safety factor with these investments can be analyzed by considering credit rating. They are freely tradeable and transferable and hence provides for liquidity. Fixed income securities provide investors with two kinds of income. They are :

(a) Current income (periodical receipt of interest or dividend)

(b) Capital gains

The funds mobilized by ICICI and IDBI through debt issues accounted for high percentage of funds mopped in primary market. Financial institutions, banks and corporate bonds are offering attractive bonds like deep discount bond, education bonds, flexi-bonds etc.

3.2 BOND

3.2.1 Types of Bonds

Q2. Define bond. Explain the features of bond.

Ans : (April-22)

Meaning

A bond is a long-term debt instrument that promises to pay a fixed annual sum as interest for a specified period of time.

Features

i)   **A Sealed Agreement :** The indenture is a long, complicated legal instrument containing the restrictions, pledges and promises of the contract. Bond indenture involves three parties.

ii) **Specified Time Period (Maturities) :** Maturities vary widely. Bonds are usually grouped by their maturity classes. Short-term bonds are usually bonds maturing within 5 years. They may be secured or unsecured. These are common in industrial financing. Medium-term bonds mature in 5 to 10 years. If a bond is originally issued on a medium-term bond, it is usually secured by a real estate or equipment mortgage, or it may be backed by other security.

iii) **Interest Payment :** Bond interest is usually paid semi-annually, though annual payments are also popular. The method of payment depends upon whether the bond is a coupon (bearer) or registered bond.

iv) **Pledge of Security :** The issuing company sometimes promises to pay to the bondholder by offering some security like property. The pledge of security is a promise to the bondholders in writing and signed under seal and presented to the trustee by the company.

Q3.   Explain the Reasons for Issuing Bonds.

Ans :

Following are the various reasons for issuing bonds:

i)   **Reduce the Cost of Capital :** Bonds are the cheapest source of financing. A corporation is Willing to incur the risk of borrowing in order to reduce the cost of capital by financing a portion of its assets with securities bearing a fixed rate of return in hope of increasing the ultimate return to the equity holder.

ii) **Gain the Benefit of Leverage :** The presence of debt and/or preference shares in the company's financial structure means that it is using financial leverage. When financial leverage is use changes in earnings before interest and tax (EBIT) translate into the larger changes in earnings per share. However, leverage is a two-edged sword as EBIT can rise or fall. If it falls, and financial leverage is used, the equity holders endure negative changes in EPS that are larger than the relative decline in EBIT.

iii) **Effect of Tax Saving :** Unlike. dividends on equity, the interest on bonds is deductible in figuring up corporate income for tax purposes. Hence, the EPS increases if the financing is through bonds rather than with preference or equity shares.

iv) **Widen the Sources of Funds :** By issuing bonds, the corporation can attract funds from individual investors and especially from those investing institutions which are reluctant or not permitted to purchase equity shares.

v)   **Preserve and Control :** An increase in debt does not diminish the voting power of present owners since bonds ordinarily carry no voting right.

3.3 TYPES OF BONDS

Q4.   Explain the classifications of bonds.

(OR)

Explain the various types of Bonds.

(OR)

Describe the types of bonds.

Ans :   (May-19, April-23)

i)   **Secured Bonds and Unsecured Bonds**

The secured bond is secured by the real assets of the issuer. In case of the unsecured bond, the name and fame of an issuer may be the only security.

ii) **Perpetual Bonds and Redeemable Bonds**

Bonds that do not mature or never mature are called perpetual bonds. The interest alone would be paid. In redeemable bonds, the bond is redeemed after a specific period of time. The redemption value is specified by the issuer.

iii) **Fixed Interest Rate Bonds and Floating Interest Rate Bonds**

In fixed interest rate bonds, the interest rate bonds, the interest rate is fixed at the time of the issue, where as in the floating interest rate bonds, the interest rates change according to already fixed norms.

For example, in December 1993 the State Bank of India issued floating interest rate bonds worth ₹500 crore, pegging the interest rate with its three and five years' fixed deposit rates to provide built-in yield flexibility to the investors.

iv)   Zero Coupon Bonds

These bonds sell at a discount and the face value is repaid at maturity. The origin of this type of bond can be traced to the US Security Market The high value of the US government security prevented investors from investing their money in government security.

The difference between the purchase cost and face value of the bond is the gain for the investor. Since the investor does not receive any interest on the bond, the conversion price is suitably arranged to protect the loss of interest to the investor. The discounted value is calculated using the formula:

$$\text{Present value} = \frac{\text{Face value of the bond}}{(1+R)^n}$$

Where

R = interest rate and n = number of years.

v)   Deep Discount Bonds

A deep discount bond is another form of zero coupon bond. The bonds are sold at a large discount on their nominal value and interest is not paid on them. Also, they mature at par value. The difference between the maturity value and the issue price serves as an interest return. The deep discount bonds' maturity period may range from three years to 25 years or more.

Q5.   What is bond valuation? Explain how the capitalization of income method is used in valuing bonds. Give an example.

Ans :

Meaning

Bond valuation is the process of determining the bond values. Bond values actually refers to the present values of securities like bonds, debentures etc. The present value of all the securities future cash flow is given by,

$$\text{Present value} = \left[\frac{\text{Coupon}_1}{(1 + YTM)^1} + \frac{\text{Coupon}}{(1 + YTM)^2} + ... + \frac{\text{Coupon}_n + \text{Face value}}{(1 + YTM)^n} \right]$$

Capitalization of Income Method

An investor who believes that the efficiency of bond market would question the ability of other investors to identify mispriced situations. However, if an investor believes that such situations exist, then an economically sensible and logical approach to valuation is needed to identify them. One such approach is the capitalization of income method of valuation.

This method of valuation states that the intrinsic value of any asset is based on the discounted value of cash flows that the investor expects to receive in the future from owning the bond. The intrinsic value is to be compared with existing value of a bond, so as to state whether the bond is overpriced, underpriced or fairly priced. Another way is to compare the bond YTM (Yield To Maturity) with AYTM (Approximate Yield to Maturity).

If YTM > AYTM, then the bond is underpriced,

If YTM < AYTM, then the bond is overpriced.

However,

If YTM = AYTM, then the bond is said to be fairly priced.

<div align="center">

3.4 INTEREST RATES

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Q6. Explain briefly about Interest rates.

Ans :

Interest rates are usually considered as the price for loanable funds. There always exists a variations in price depending upon the demand and supply for funds which leads to a wider varieties of interest rates. The spread which exists between the lowest and highest rates can be estimated as 10% to 15% points. In bond, this percentage points is equivalent to 1000 to 1500 basis points. Focusing on one interest rate acts as a base for other rates as well. This rate is known as short-term Riskless Rate (RF) and this rate is proxied by the rate on treasury bills. Other interest rate varies from RF on account of two factors. They are,

(i) Maturity differentials

(ii) Risk premiums

3.4.1 Term Structure of Interest Rates

Q7. Explain the concept of term Structure of Interest Rates.

<div align="center">

(OR)

</div>

Explain the term structure of interest rates.

Ans :   **(Nov.-20)**

It is a connection between time to maturity and yield for a particular category of bonds at a particular time by keeping all the factors constant, especially the default risk. Mostly if the length of time to maturity is more, the more will be the interest rates.

The term structure scenario is outlined by yield curve.

Yield curve is a graphical representation, which shows the connection between the length of time to maturity and yields, where the X-axis represents time to maturity and Y-axis represents yield to maturity.
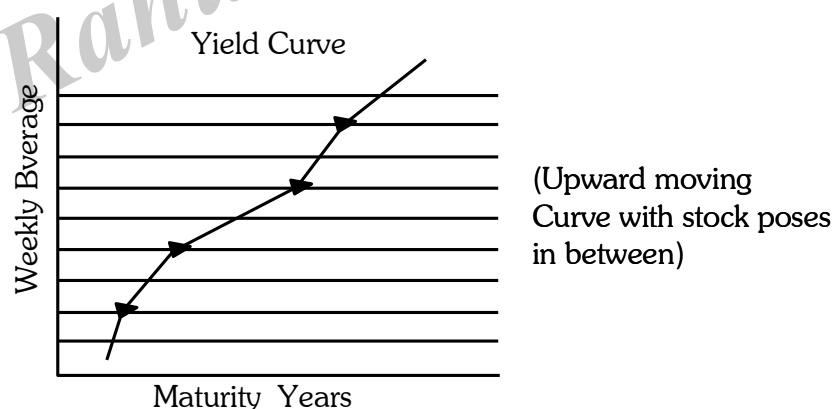
The yield curve basically includes the instincts but not the actual connection between the yield and time to maturity. Therefore, this yield curve is not fit for showing the connection between yield and time to maturity.

Term Structure Theories

The term structure theories of interest rates are used for describing the shape, slope and reasons for its changes (shifts of the yield curve). The term structure theories are,

i)   Pure or Unbiased Expectation Hypothesis Theory

This theory specifies that there exists evenly balanced amount between long term rate of interest and an average returns of short-term rates. Apart from these, the expected present short-term returns which are expected to prevail for the long period of time.

In expectation theory, the long term rates should be an average of present short term rates and also be an average of future short term rates.

This expectation theory states that, today's rates and future expected rates have a connection and after ascertaining under the hypothesis, this theory concludes that "investors may anticipate identical return by not considering the option of investment". The yield curve for expectation hypothesis will be flat.

$_tR_n$ $\rightarrow$ Securities current known yield at time 't' with periods to maturity

$_{t+1}r_n$ $\rightarrow$ The yield that is likely to prevail an year from today at time 't+1' for V periods (i.e., the forward rates)

The 3 years bond rate should be a geometric average of the current 1 year rate (i.e., $_tR_1$) and the expected forward rates for subsequent 2 years.

Where,

$_tR_3 \rightarrow \left[(1 +_t R_1)(1 +_{t+1} r_1)(1 +_{t+2} r_1)\right]^{1/3} - 1.0$

$_tR_3$ $\rightarrow$ Rate on 3-year bond

$(1+_tR_3)$ $\rightarrow$ Known rate on a current 1 year bond

$(1 +_{t+1}r_1)$ $\rightarrow$ Expected rate on a bond with 1 year to maturity beginning 1 year from the current year.

$(1 +_{t+2}r_1)$ $\rightarrow$ Expected rate on a bond with 1 year to maturity beginning 2 years from the current year.

ii)   Liquidity Preference Theory

This theory specifies the same rule as of the expectation theory, but it also includes the risk premiums for its hypothesis.

Liquidity preference theory = Expectation theory + Liquidity risk premiums.

The distinguished features between liquidity preference theory and expectation hypothesis theory are,

i)   Uncertainty in expected interest rates and

ii)   Expected future rates are not similar when compared to forward rates.

Ultimately, this theory concludes that the prolonged term bonds have to be put forward for the higher yields. Thus, yield curve under this theory has upward sloping direction.

iii) Segmented Market Theory

In segmented market theory, several investors, instead of containing distinctive maturity requirements, restrict themselves to a particular maturity segment. The investor does not want to move from one to the other maturity sector even though it possesses benefits from the consequences which occurs.

The yield curve in this segmented market theory depends upon the supply and demand determinants, curve can come to any shape, it can slope downwards or upwards accordingly.

iv)   **Preferred Habitat Theory**

This theory of preferred Habitat is like segmented market theory but varies to a certain extent. The investor has option for maturity sector and different habitats. The investor who wishes to move to any maturity sector, provided, if they fairly obtain a suitable risk premiums under this theory.

The expected future interest rates and risk premiums play a crucial role in this hypothesis and yield curve can have any shape.

3.5 Measuring Bond Yields - YTM, YTC, Holding Period Return

Q8.   What is Bond Yields? Explain the various techniques in which the bond is calculated.

Ans :   **(Imp.)**

Meaning

Bond Yield may be defined as the rate of interest that is paid by the company issuing bonds to the owner of a particular bond. The Bond Yield for any specific bond, is commonly determined by dividing the effective coupon rate of a bond by its current market price.

The Bond Markets function in a manner that the Coupon Rate (or) rather the Coupon payments for every particular type of bond that is issued in the Bond Market, is fixed. Which implies that irrespective of the current market prices of the bonds in the Bond Market, the payments received by each particular bond remains the same or constant.

The Bond Yield, as a rule, is expressed as a percentage on the face value of the particular bond.

Calculation of Bond Yield

The Bond Yield can be calculated following other methods of calculation. The Bond Yield from the Bond Markets are also calculated as follows :

i)   **Coupon Yield:** Coupon Yield (or) Nominal Yield, is also referred to as the Coupon Rate in the Bond Market parlance. As already mentioned above, this type of Bond Yield is calculated at the end of a financial year and is paid as a fixed coupon amount on the original face value of the particular bond. However, this Bond Yield is expressed as a percentage on the face value of the Bond.

ii)   **Current Yield:** Current Yield, in contrast to the Coupon Yield (or) Nominal Yield, is a Bond Yield that is determined by dividing the fixed coupon amount (that is paid as a percentage on the face or original value of the specific bond) by the current price value of the particular bond. In other words, Current Bond Yield = Coupon amount / current price of a bond.

The difference between these two Bond Yields (that is, Current Yield and Coupon Yield) is that in one where the coupon payment in divided by the face value of the bond, in the other method, the same amount that is paid annually by the issuer to the bond owner, is divided by the current market price of the bond.

iii)   **Yield to Maturity:** Yield To Maturity (or) YTM is generally calculated at the end of the term for which the bond was issued in the Bond Market. This type of a Bond Yield is calculated taking into account the eventual payment made by the company, which had issued the Bond in the first place, to the owner of the bond. Also taken into account, are the annual coupon interest payments made by the issuer together with the capital gain earned or the capital loss suffered by the lender on the investment. The calculation is carried out taking for granted that the investor (or the lender of the capital sum) can reinvest the coupon payments received, at an interest rate which equal to the Bond Yield named Yield to Maturity.

Q9. Explain the different ways in which the return of a bond can be calculated.

Ans :

The investor in bond typically receives income from the following,

(i) Interest payment at a contracted rate i.e., coupon rate

(ii) Capital gain or loss arising out of sale of the bond

(iii) Cash realization on the sale of bond

(iv) Redemption of the bond by the issue at a contracted value.

(a) Holding Period Return

An investor buys a bond and sells it after holding for a period. The rate of return in that holding period is calculated as follows:

$$\text{Holding period return} = \frac{\text{Price change} + \text{Coupon interest}}{\text{Price at the beginning of the holding period}}$$

(b) Current Yield

The current yield is an annual cash flow measure of return based on current market price. It is the coupon payment as a percentage of current market price and is computed as follows,

$$\text{Current yield} = \frac{\text{Annual coupon payment}}{\text{Current market price}}$$

(c) Yield to Maturity (YTM)

The concept of Yield to Maturity (YTM) is one of the widely used tools in bond investment manage-ment. The current way of computing the return on any asset involves considering the entire sequence of cash flows with their timing and calculating the internal rate of return.

In case of a bond, there is a cash outflow (equal to the price of the bond) when the bond is bought but there are cash allows, when the periodic interest coupons are received, another cash inflow is the redemption value which is received on maturity.

Calculating the IRR of these streams of cash flows gives the true return on the bond which is known as the Yield to Maturity (YTM).

Therefore, YTM is the single discount factor that makes present value of future cash flows from bond equal to the current price of the bond. To find out the yield to maturity, present value technique is adopted. The formula is,

$$\text{Present value} = \frac{\text{Coupon}_1}{(1+y)^1} + \frac{\text{Coupon}_2}{(1+y)^2} + \dots + \frac{(\text{Coupon}_n + \text{Face Value})}{(1+y)^n}$$

(or) $P_0 = C(\text{PVIFA}_{y,1}) + F(\text{PVIF}_{y,r})vb$

Where y = YTM

(d) **Approximate Yield to Maturity (AYTM)**

Many investors do not bother to calculate the YTM, and instead analyze the return earned in a very simple way. The reason is that the total return consists of interest payment and the capital gain/loss on redemption.

$$\text{AYTM} = \frac{C + \left[\dfrac{(P_n - P_0)}{n}\right]}{\dfrac{(P_n + P_n)}{2}}$$

Where,

   C = Coupon amount

   P = Face value

   P_0 = Market value (redemption value)

   n = Maturity period

Similarly, the average investment is equal to half the redemption price and purchase price. Therefore, the annual return calculated based on these approximation is called as 'Approximate YTM' (AYTM). The formula for approximate YTM is as follows,

(e) **Yield to Call (YTC)**

Sometimes, issuer of a bond has the option to call (or redeem) to bond before it reaches maturity. This is likely to occur when the coupon interest rate on similar new bonds is substantially below the coupon interest on existing bonds, because the corporation can save money on future interest payment and such callable bonds. The discount rate that equates the present value of the cash flow to first call of a callable bond and its market value can be termed as yield to call.

When a bond has an excellent chance of being called, an investor may want to calculate the yield to call for the bond which is the discount rate that equates the present value of the cash flows to first call of a callable bond to its market value.

3.6 Bond Pricing Theorems

Q10. Explain briefly about various bond theorems.

(OR)

Explain in detail the various bond pricing theorems.

Ans :   **(Dec.-18)**

The value of the bonds depends upon three factors namely, the coupon rate, years to maturity and the expected yield to maturity or the required rate of return. On the basis of this, bond value theorems have been evolved.

Theorem 1

If the market price of the bond increases, the yield would decline and vice versa.

Example	Bond A	Bond B
Par value	Rs 1000	Rs 1000
Coupon rate	10%	10%
Maturity period	2 years	2 years
Market price	Rs 874.75	Rs. 1035.66
Yield	18%	8%

Even though the bonds are of same maturity and coupon rate, the difference in the market price leads to difference in the yield. The bond with low price has high yield because with lesser amount of money more return is earned.

Theorem 2

If the bond's yield remains the same over its life, the discount or premium depends on the maturity period.

Example	Bond A	Bond B
Par value	Rs 1000	Rs 1000
Coupon rate	10%	10%
Yield	15%	15%
Maturity Period	2	3
Market Price	918.71	885.86
Discount	Rs.81.29	Rs.114.14

This means, the bond with a short term to maturity sells at a lower discount than the bond with a long term to maturity.

Theorem 3

If a bond's yield remains constant over its life, the discount or premium amount will decrease at an increasing rate as its life gets shorter. Consider a bond with the face value of Rs.1000, and maturity period of 5 years with 10% yield to maturity. The calculated values are given below:

Years to Maturity	The Present of Value
5	620.9
4	683.0
3	751.3
2	826.4
1	909.1

The above example shows that the discount rate declines when the bond approaches to maturity. The same point is given in figure below.
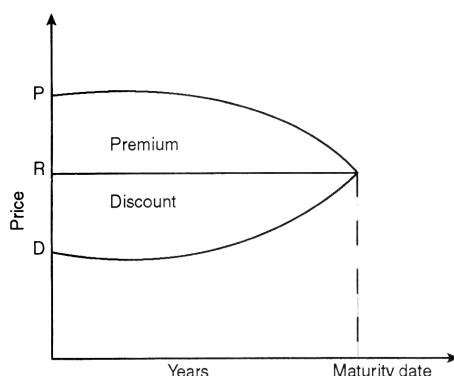
Fig. : Bond's Price Changes during its Life

Theorem 4

A raise in the bond's price for a decline in the bond's yield is greater than the fall in the bond's price for a raise in the yield. Take a bond of 10% coupon rate, maturity period of five years with the face value of Rs 1000. If the yield declines by 2%, that is to 8% then the bond price will be Rs 1079. 87

= Rs 100(PVIFA 8%, 5 yrs) +1000(PVIF 8%, 5yrs)

= Rs 100 × 3.9927+ Rs. 1000 × 0.6806

= Rs. 1079.87.

If, the yield increases by 2% then, the bond price   will be Rs 927.88.

= Rs. 100(PVIFA 12%, 5 yrs) +1000 (PVIF 12%, 5 yrs)

= Rs. 100 × 3.6048 + Rs. 1000 × .0.5674

= Rs. 927.88

Now the fall in yield has resulted in a raise of Rs 79.86 but the raise in the yield caused a variation of Rs 72.22 in the price.

Theorem 5

The change in the price will be lesser for a percentage change in bond's yield if its coupon rate in higher. It is explained by the following example

Example	Bond A	Bond B
Coupon rate	10%	8%
Yield	8%	8%
Maturity Period	3	3
Price	Rs 105.15	Rs 100
Face Value	Rs 100.00	Rs 100.00
Yield Raise	1%	1%
Price after yield raises	Rs 102.53	Rs 97.47
Percentage Change in price	2.4%	2.53%

3.7 BOND DURATION

Q11. What is Bond Duration ? How it is calculated.

Ans :   (April-22, Dec.-19)

Meaning

Duration is an estimated measure of the price sensitivity of a bond to a change in interest rates. It can be stated as a percentage or in dollar amounts. It can be helpful to "shock" or analyze what will happen to a bond when market rates increase or decrease.

The duration of a financial asset measures the sensitivity of the asset's price to interest rate movements, expressed as a number of years. The reason for expressing this sensitivity in years is that the time that will elapse until a cash flow is received allows more interest to accumulate. Therefore the price of an asset with long term cashflows has more interest rate sensitivity than an asset with cashflows in the near future.

Because of this relationship, duration is sometimes calculated as the weighted average number of years to receive each cashflow. Thus the duration of a zero coupon bond with a maturity period of n years is n years, since the only cashflow will occur in n years. If there are coupon payments, the duration will be less than n years.
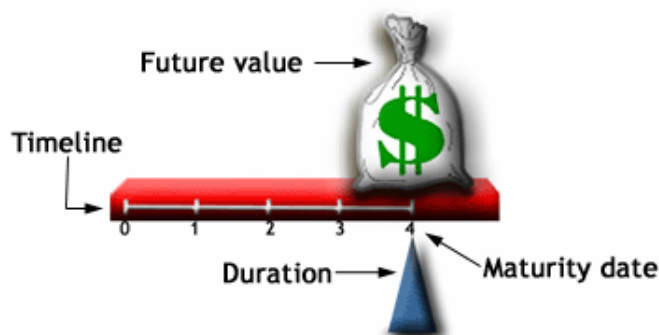
Figure : Duration of a Bond

This measure is closely related to the derivative of the bond's price function with respect to the interest rate, and some authors define the duration to be this derivative divided by the price. This ratio is the weighted average term, with appropriate weightings for a non-callable bond.

The standard definition of duration:

$$D = \sum_{i=1}^{n} \frac{P(i)\, t(i)}{V}$$

where

P(i) is the present value of each cash payment from an asset (or each expense from a liability)

t(i) is the time in years until each payment will be received (or when each expense is due),

V is the present value of all cash payments from the asset (or all expenses from the liability) until maturity.

D is the duration.

Q12. Explain briefly about the Macaulay's Duration.

Ans :

The formula usually used to calculate a bond's basic duration is the Macaulay duration, which was created by Frederick Macaulay in 1938, although it was not commonly used until the 1970s. Macaulay duration is calculated by adding the results of multiplying the present value of each cash flow by the time it is received and dividing by the total price of the security. Macaulay duration, named for Frederick Macaulay who introduced the concept, is the weighted average maturity of a bond where the weights are the relative discounted cash flows in each period.

$$\text{Macaulay Duration} = \frac{\Sigma(\text{Cashflow discovered with yield to maturity} \times \text{Time to cashflow})}{\text{Price of the bond}}$$

Macaulay showed that an unweighted average maturity is not useful in predicting interest rate risk. He gave two alternative measures that are useful:

➤ The theoretically correct Macaulay-Weil duration which uses zero-coupon bond prices as discount factors, and

➤ the more practical form (shown above) which uses the bond's yield to maturity to calculate discount factors.

The key difference between the two is that the Macaulay-Weil duration allows for the possibility of a sloping yield curve, whereas the algebra above is based on a constant value of r, the yield, not varying by term to payment.

With the use of computers, both forms may be calculated, but the Macaulay duration is still widely used.

The formula for Macaulay duration is as follows :

$$\text{Macaulay Duration} = \frac{\sum_{t=1}^{n} \frac{t*C}{(1+i)^t} + \frac{n*M}{(1+i)^n}}{P}$$

Where

n = number of cash flows

t = time to maturity

C = cash flow

i = required yield

M = maturity (par) value

P = bond price

Remember that bond price equals :

$$C * \frac{\left[1 - \left[\frac{1}{(1+i)^n}\right]\right]}{i} + \frac{M}{(1+i)^n}$$

So the following is an expanded version of Macaulay duration :

$$\text{Macaulay Duration} = \frac{\sum_{t=1}^{n} \frac{t*C}{(1+i)^t} + \frac{n*M}{(1+i)^n}}{C * \left[\frac{1 - \left[\frac{1}{(1+i)^n}\right]}{i}\right] + \frac{M}{(1+i)^n}}$$

3.7.1 Modified Duration

Q13. Explain briefly about Modified Duration of bond.

Ans :

The relationship between a change in the price of a bond relative to change in its yield to maturity is usually referred to a as modified Macaulay's Duration (MMD).

The relationship between a change in price of a bond to a change in YTM is,

$$\frac{\Delta P_0}{\Delta YTM} = -\left(\frac{1}{1+YTM}\right) \times MD \times P$$

Where, P0 is bond's price and $\frac{\Delta P_0}{\Delta YTM}$ indicates change in bound's price with corresponding change in YTM.

Therefore it can be determined as follows.

$$MMD = \frac{MD}{1+YTM}$$

Where,

MMD = Modified Macaulays Duration

MD = Macaulay's Duraction

YTM = Yield to Maturity.

3.8 ACTIVE AND PASSIVE BOND MANAGEMENT STRATEGIES

Q14. Discuss various Active and Passive Bond Management Strategies.

(OR)

Describe the importance of Active and Passive bond management.

(OR)

Discuss elaborately active and passive bond management strategies.

Ans :   *(Nov.-20, Dec.-18, Imp.)*

A)   Active Bond Management

i)   Active bond management need to adopt more/ enhanced investment strategies so as to attain effective bond portfolio.

ii)   The prime objective is to expect appropriate interest rates as they tend to deviate frequently and tries to trace out the mispriced bonds thereby valuing them correctly.

iii) Based on the estimations of interest rates, investors would be able to render specific durations for their investments. If the interest rates are high then duration assigned would be less and if the interest rates are reasonable then duration will be more.

iv)   After identifying the mispriced bonds, investors would be able to recognize the bonds which have been underpriced and overpriced and hence can be valued correctly.

v)   However, fulfilling these two objectives is a complicated activity and hence involves collection of accurate information and effective analysis which can be accomplished by adopting various investment strategies.

Strategies

While bonds are often purchased to be held to maturity, many a time they are not. Henry Kaufman, a renowned bond expert, argues that "bonds are bought for their price appreciation potential and not for income protection". Many bond investors subscribe to this view and pursue active strategies. They seek to profit by :

1.　Forecasting Interest Rate Changes

Bond prices and interest rates are inversely related. Hence, if an investor expects interest rates to fall, he should buy bonds, preferably bonds with longer maturity (more precisely, longer duration), for price appreciation On the other hand, if an investor expects interest rates to rise, he should sell bonds, particularly bonds with longer maturity.

i)　Select a particular investment period and predict bond yields at the end of that period.

ii)　Calculate the bond price at the end of the investment period.

iii)　Estimate the future value of coupon incomes earned over the investment period.

iv)　Add the future value of coupon incomes over the investment period to the predicted capital gain or loss to get a forecast of the total return on the bond for the holding period.

v)　Annualize the holding period return.

2.　Exploiting Relative Mispricings among Securities

Bond portfolio managers regularly monitor the bond market to identify temporary relative mispricings. The most popular bond swaps are described below.

i)　Substitution Swap : A substitution swap involves bonds that are very similar in terms of credit rating coupon payments, maturity, call provisions, and liquidity. The only difference between them, at a particular time, is that they sell at different prices hence different yields. The swap is made from the lower yield .bond to the higher yield bond. If the yield on the latter declines to that of the former, the bond holder enjoys capital appreciation.

ii)　Pure Yield Pickup Swap : A .pure yield pickup swap involves a switch from a lower yield bond to a higher yield bond of almost identical quality and maturity. Unlike a substitution swap, this swap is not based on expectations about price changes. It is motivated strictly by a desire to earn a higher yield.

iii)　Intermarket Spread Swap : An intermarket spread swap seeks to benefit from the expected changes in the yield differences between various sectors of the bond market.

iv)　Tax Swap : A tax swap involves selling an existing bond at a capital loss, using the capital loss to offset capital gains in other securities, and purchasing another bond with similar features.

B)　Passive Strategies

Bonds have acquired tremendous significance and managing a portfolio of bonds has become fairly complex. Bond investors may follow a variety of strategies ranging from passive to active.

Many investors believe that securities are fairly priced in the sense that expected returns are commensurate with risks. Such a belief supports a passive strategy, implying that the investor does not actively try to outperform the market.

Of course, a passive strategy does not mean that the investor does nothing. Even a passive investor will have to :

i)　Determine whether bonds are suitable investment avenues for him,

ii)　Assess risks (default risk, call risk, and so on) and reasonably diversify his holdings, and

iii)　Periodically monitor his bond portfolio to ensure that his holdings match his risk preferences an objectives.

Two commonly followed strategies by passive bond investors are: buy and hold strategy and indexing strategy.

1) **Buy and Hold Strategy :** An investor who follows a buy and hold strategy selects a bond portfolio and stay with it. He does not turn his bond portfolio in an attempt to improve returns and/or reduce risks. Obviously, such an investor chooses a bond portfolio that promises to meet his investment objectives and hence spends time and effort in his initial selection.

2) **Indexing Strategy :** If the capital market is efficient, efforts to find under-priced securities or to time the market may be futile. Empirical research on this issue suggests that most investors are unlikely to outperform the market. Hence, they may find an indexing strategy appealing Such a strategy calls for building a portfolio that mirrors a well-known bond index. In the US, two well known bond indices are the Shearson Lehman Index and the Salomon Brothers Index. i-BEX is a popular bond index in Index.

3.9 BOND IMMUNIZATION

Q15. Explain in detail about Bond Immunization.

Ans :   (Aug.-21, Imp.)

Meaning

i) Immunization is a technique that makes the bond portfolio holder to be relatively certain about the promised stream of cash flows.

ii) The bond interest rate risk arises from the changes in the market interest rate.

iii) The market rate affects the coupon rate and the price of the bond. In the immunization process, the coupon rate risk and the price risk can be made to offset each other.

iv) Whenever there is an increase in the market interest rate, the prices of the bonds fall. At the same time the newly issued bonds offer higher interest rate.

v) The coupon can be reinvested in the bonds offering higher interest rate and losses that occur due to the fall in the rice of bond can be offset and the portfolio is said to be immunized.

Process

The bond portfolio manager or investor has to calculate the duration of the promised outflow of the funds and invest in a portfolio of bonds which has an identical duration. The bond portfolio duration is the weighted average of the durations of the individual bonds in the portfolio.

Limitation

➢ Every time market interest rates change the duration of every bond changes.

➢ Duration tends to diminish more slowly than calendar time for coupon-paying bonds when interest rates do not change.

➢ Therefore, periodic rebalancing will be necessary to continuously immunize portfolio of bonds.

➢ In addition, yield curves are not necessarily flat and do not shift in a parallel fashion, so the use of duration will not be exact.

3.9.1 Bond Volatility

Q16. Explain in detail about Bond Volatility.

(OR)

Briefly explain about bond volatility.

Ans :   (April-23, Dec.-19, May-19, Imp.)

Meaning

A bond's price volatility is in part a function of its term to maturity and in part of its coupon yield. Unfortunately, there is no exact relationship between bond maturities and bond price volatilities with respect to interest rate changes. There is, however, a fairly close relationship between bond duration and price volatility - at least, so long as the market does not experience wide swings in yield. That is, duration can be used as a viable prediction of price volatility so long as the yield swings are relatively small.

The problem is, because the price-yield relationship of a bond is convex in form (but duration is not), when the market (or bond) undergoes a big change in yield, duration will understate price appreciation when rates fall and will overstate the price decline when rates increase. Assuming that is not the case (i.e., that the investor is dealing with relatively small changes in the market yield), then multiplying a bond's duration value by -1 results in its price elasticity with respect to interest rate changes. Thus, by calculating a bond's duration, it is possible to obtain a fairly accurate measure of how much its price will change relative to a given (reasonably small) change in market interest rates.

The mathematical link between bond price and interest rate changes involves the concept of modified duration. The formula for modified duration is :

$$\text{Modified duration} = \frac{\text{Duration in years}}{1 + \text{yield to maturity}}$$

3.9.2 Bond Convexity

Q17. Explain in detail about Bond Convexity.

(OR)

Briefly explain about Bond Convexity.

Ans :   **(April-23, Dec.-19, May-19)**

As bond yields go higher, price goes lower. This relationship between price and yield has a convex structure in nature. The term used to describe this relationship is also known as convexity.

If we graph a tangent at a particular price of the bond (touching a point on the curved price-yield curve), the linear tangent is the bond's duration, which is shown in red on the graph below. The exact point where the two lines touch represents Macaulay duration. Modified duration, as we saw in the preceding section of this tutorial, must be used to measure how duration is affected by changes in interest rates. But modified duration does not account for large changes in price. If we were to use duration to estimate the price resulting from a significant change in yield, the estimation would be inaccurate.
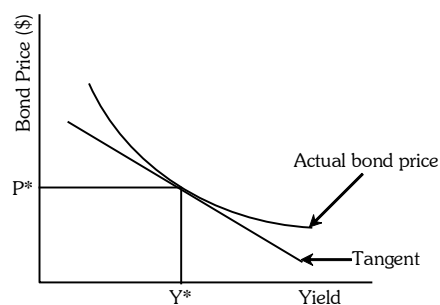
Furthermore, as yield moves further from Y*, the yellow space between the actual bond price and the prices estimated by duration (tangent line) increases.

The convexity calculation, therefore, accounts for the inaccuracies of the linear duration line. This calculation that plots the curved line uses a Taylor series, a very complicated calculus theory that we won't be describing here. The main thing for you to remember about convexity is that it shows how much a bond's yield changes in response to changes in price.

Q18. What are the properties of convexity ?

Ans :

i) Convexity is also useful for comparing bonds. If two bonds offer the same duration and yield but one exhibits greater convexity, changes in interest rates will affect each bond differently.

ii) A bond with greater convexity is less affected by interest rates than a bond with less convexity.

iii) Bonds with greater convexity will have a higher price than bonds with a lower conve-xity, regardless of whether interest rates rise or fall. This relationship is illustrated in the following diagram :
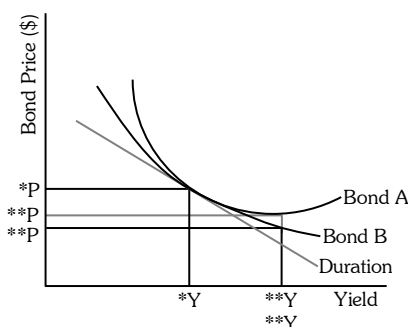
iv) As you can see Bond A has greater convexity than Bond B, but they both have the same price and convexity when price equals *P and yield equals *Y.

v)   If interest rates change from this point by a very small amount, then both bonds would have approximately the same price, regardless of the convexity.

vi)   When yield increases by a large amount, however, the prices of both Bond A and Bond B decrease, but Bond B's price decreases more than Bond A's.

Q19. What Factors affecting bond Convexity ?

Ans :

The following are the different kinds of convexities produced by different types of bonds:

1)   The graph of the price-yield relationship for a plain vanilla bond exhibits positive convexity. The price-yield curve will increase as yield decreases, and vice versa. Therefore, as market yields decrease, the duration increases (and vice versa).
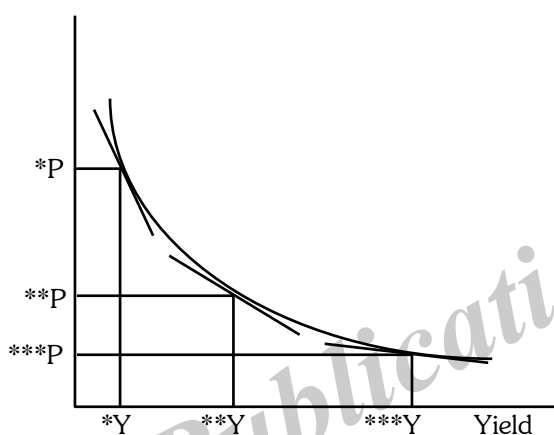
2)   In general, the higher the coupon rate, the lower the convexity of a bond. Zero-coupon bonds have the highest convexity.

3)   Callable bonds will exhibit negative convexity at certain price-yield combinations. Negative convexity means that as market yields decrease, duration decreases as well. See the chart below for an example of a convexity diagram of callable bonds.
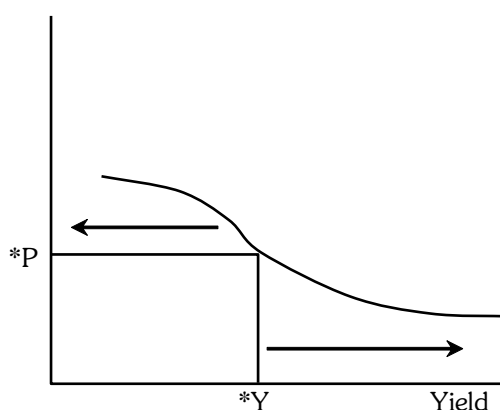
Convexity is the final major concept you need to know for gaining insight into the more technical aspects of the bond market. Understanding even the most basic characteristics of convexity allows the investor to better comprehend the way in which duration is best measured and how changes in interest rates affect the prices of both plain vanilla and callable bonds.

PROBLEMS

1. **The face value of a bond is ₹ 1,000 coupon rate of 8% life of bond is 5 years and the market price of bond is ₹ 1,042. Compute YTM of this bond.**

Sol :   **(April-22, Dec.-19, Imp.)**

Given that,

Face value of bond, P_n = ₹ 1,000

Market value of bond, P_0 =   ₹ 1,042

Coupon rate,   r = 8%

Coupon amount,   C   = 8% of ₹ 1,000 = ₹ 80

$$P_0 = C (PVIFA_{y.n}) + P_n(PVIF_{y.n})$$

Consider the YTM rate as 7%.

$$P_0 = 80(PVIFA_{7\%, 5yrs}) + 1,000(PVIF_{7\%, 5yrs})$$

Note :

The PVIF value is take from present value interest factor table)

= 80(4.10) + 1,000(0.713)

= 328 + 713

= ₹ 1,041

Since, the value is less than ₹ 1,042, try with lower rate,

Now, consider YTM rate as 6%

P_0 = 80(PVIFA$_{6\%, 5yrs}$) + 1,000(PVIF$_{6\%, 5yrs}$)

= 80(4.21) + 1,000(0.747)

= 336.8 + 747

= ₹ 1083.8 ≅ 1084

Above calculation shows that at 7%, value is   ₹ 1,041 and at 6% value is ₹ 1,084. But investor should get YTM value to get ₹ 1,042. By using interpolation between 6% and 7 we get exact value.

$$YTM = 6 + \frac{1084 - 1042}{1084 - 1041} \times (7 - 6)$$

$$= 6 + \frac{42}{43} \times 1$$

$$= 6 + 0.98$$

$$YTM = 6.98\%$$

Hence, yield to maturity of the bond is 6.98%

2. **A Reliance industries debenture with a face value of ₹ 100 has a coupon of 10% per annum coupon payment being made annually. The maturity date of the instrument is 7th May 2018. The traded price of the bond on 7th May 2016 is ₹ 110. Compute the yield to maturity of the bond.**

Sol :   (May-19, Imp.)

Given that,

Face value of bond, P_n = ₹ 100

Market value of bond, P_o = ₹ 110

Coupon rate, r = 10%

Coupon amount, c = 10% of ₹ 100 = ₹ 10

Maturity,   n = 2 yrs

$$P_o = C\ (PVIFA_{y.n}) + P_n(PVIF_{y.n})$$

The above equation can be solved by considering trial and error method.

Consider the YTM rate as 5%

$$P_o = 10(PVIFA_{5\%,\ 2\ yrs}) + 100(PVIF_{5\%,\ 2\ yrs})$$

$$= 10(1.859)\ 100(0.907)$$

$$= 18.59 + 90.7$$

$$= 109.29$$

Since, the values is less than ₹ 110, try with lower rate,

Now, consider YTM rate as 4%

$$p_o = 10(PVIFA_{4\%,\ 2\ yrs}) + 100(PVIF_{4\%,\ 2\ yrs})$$

$$= 10(1.86) + 100(0.925)$$

$$= 18.66 + 92.5$$

$$= 111.16$$

Above calculation shows that at 5% value is ₹ 109.29 and at 4% value is ₹ 111.16. But investor should get YTM value to get ₹ 110. By using interpolation between 4% and 5% we get exact value.

$$YTM = 4\% + \frac{111.16 - 110}{111.16 - 109.29} \times (5\% - 4\%)$$

$$= 4\% + \frac{1.16}{1.87} \times 1\%$$

$$= 4\% + 0.62$$

YTM = 4.62%

Hence, yield to maturity of the bond is 4.62%

3.   **A ₹ 100 per value bond bears a coupon rate of 14 percent and matures after five years. Interest is payable semi-annually. Compute the value of the bond if the required rate of return is 16%.**

Sol :   **(May-19, Imp.)**

In this given case, the number of half-yearly periods is 10.

Half-yearly interest$_{(C)}$ payment = ₹ 100 × 14% × $\dfrac{1}{2}$

$$C = ₹14 \times \dfrac{1}{2}$$

$$C = ₹7$$

The discount rate   = $\dfrac{16\%}{2} = 8\%$

Thus, the bond value is,

$$V = \sum_{i=1}^{10} \dfrac{7}{(1+r)^t} + \dfrac{100}{(1+r)^{10}}$$

$$= \sum_{t=1}^{10} \dfrac{7}{(1+0.08)^t} + \dfrac{100}{(1+0.08)^{10}}$$

$$= \sum_{t=1}^{10} \dfrac{7}{(1.08)^t} + \dfrac{100}{(1.08)^{10}}$$

$$P_0 = C(PVIFA_{8\%,\,10\,years}) + 100(PVIF_{8\%,\,10\,years})$$

$$= 7(6.710) + 100(0.463)$$

$$= 46.97 + 46.3$$

$$= ₹\,93.27$$

∴ Value of bond = ₹ 93.27

4.   **Following information is available in respect of a bond:**

Face value	Rs.100
Market value	Rs. 96.44
Coupon rate	8%
Yield to maturity	10%
Duration	1.92 years

Find out Modified duration. If there is a decrease in YTM to 9%, find out the new expected market price.

Sol :   **(April-23)**

Modified Duration = Duration / (1 + Yield to Maturity)

Given information:

Face value: Rs. 100

Market value: Rs. 96.48

Coupon rate: 8%

Yield to maturity (YTM): 10%

Duration: 1.92 years

Calculating the modified duration:

Modified Duration $= \dfrac{1.92}{1+0.10} = \dfrac{1.92}{1.10} = 1.75$

Therefore, the modified duration is approximately 1.75.

When YTM increases Bond price increases also when YTM decreases Bond price increases. There is an inverse relation between the bond price and the YTM.

Percentage Change in Price = – Modified Duration * Change in Yield

Given, Change in Yield = 9% – 10% = – 1%

Using the formula, we can calculate the percentage change in price:

Percentage Change in Price $= -1.75 \times (-0.01)$

5. **An investor wants to evaluate the following bond :**

Face value	Rs.100
Coupon value	12%
Maturity	3 years

(a) **The investor wants a yield of 15%. What is the maximum price that the should pay for it?**

(b) **If the bond is selling for Rs.95 rupees, what would be his yield?**

Sol :   **(April-23)**

Calculation of the current price of the bond :

$$\text{Current price of bond} = \text{Interest} \times \left[\dfrac{1 - \dfrac{1}{(1+r)^n}}{r}\right] = \text{Redemption value} \times \left(\dfrac{1}{(1+r)^n}\right)$$

Where,

r = Yield rate

n = Number of years

Interest = Face value × Coupon rate

Interest = 100×0.12

Interest = 12%

Current price of j bond = $12 \times \left[\dfrac{1 - \dfrac{1}{(1+0.15)^3}}{0.15} \right] + 100 \times \left(\dfrac{1}{(1+0.15)^3} \right)$

Current price of bond = $12 \times \left(\dfrac{1 - 0.6575}{0.15} \right) + 100 \times 0.6575$

Current price of bond = $12 \times 2.2833 + 65.75$

Current price of bond = $27.40 + 65.75$

Current price of bond = ₹93.15

Present value of interest factor (PVIF) = $\dfrac{1}{(1+r)^n}$

Where,

   r = Yield rate

   n = Number of years

Year	Cash flow	PVIF@14%	Present value	PVIF@15%	Present value
0	–95	1	–95.00	1	–95.00
1	12	0.8772	10.53	0.8696	10.44
2	12	0.7695	9.23	0.7561	9.04
3	112	0.6750	75.60	0.6575	73.64
		NPV_{LR}	0.36	NPV_{HR}	–1.85

NPV_{LR} = Net Present Value at Lower Rate

NPV_{HR} = Net Present Value at Hibgher Rate

Yeild $= \text{Lower rate} + \left(\dfrac{NPV_{LR}}{NPV_{LR} - NPV_{HR}} \right)$

Yield $= 14 + \left(\dfrac{0.36}{0.36 - (-1.85)} \right) \times (15 - 14)$

Yield $= 14 + \left(\dfrac{0.36}{2.21} \right) \times 1$

Yield $= 14 + 0.16$

Yield $= 14.16\%$

6.   Mr. Gupta recently purchased a bond with a Rs. 1000 face value, a 10 percent coupon rate and four years to maturity. The bond makes annual interest payments, the first to be received one year from today. Mr. Gupta paid Rs. 1032.40 for the bond. What is the bonds yield-to-maturity?

Sol. :

Face value of a bond = Rs. 1000

Coupon rate = 10%

Coupon payment = 1000 × 10% = 100

Coupon payment = Rs. 100

Years to maturity = 4 yrs

Price of the band = Rs. 1032.40

Bond yield - to maturity (YTM) is calculated as follows :

$$V = \frac{C_1}{(1+YTM)^1} + \frac{C_2}{(1+YTM)^2} + ... + \frac{C_n}{(1+YTM)^n} + \frac{M}{(1+YTM)^n}$$

where V →   Present value or price of the bond

C →   Coupon payment

M →   face value of a bond

$$1032.40 = \frac{100}{(1+YTM)^1} + \frac{100}{(1+YTM)^2} + ... + \frac{100}{(1+YTM)^3} + \frac{100}{(1+YTM)^4} + \frac{100}{(1+YTM)^4}$$

YTM can be calculated using trial and error method :

→   Take a trial rate which is nearer to coupon rate.

→   Take trial rate as 12% and calculate present value of cashflows :

Year	Cashflows	Pv@12%	Pv of CFAT
1	100	0.893	89.3
2	100	0.797	79.7
3	100	0.712	71.2
4	100	0.636	63.6
4	1000	0.636	63.6
			Σ Pv of CFAT = 939.8

Σ Pv of CFAT = 939.8

At 12% trial rate

    1032.40 > 939.8

Take another trial rate, which is lesser than previous trial rate.

→   The second trial rate is 8%.

Year	Cashflows	Pv@12%	Pv of CFAT
1	100	0.926	92.6
2	100	0.857	85.7
3	100	0.794	79.4
4	100	0.735	73.5
4	1000	0.735	735
			Σ Pv of CFAT = 1066.2

At 8% trial rate

$1032.4 < 1066.2$

$\therefore$ Price of the bond Rs. 1032.4 lies in between Rs. 1066.2 and Rs. 939.8

$\therefore$ $r_1 = 8\%$, $r_2 = 12\%$, Pv of CFAT $r_1 = 1066.2$, Pv of CFAT $r_2 = 939.8$

Pv of Cash outlay = Rs. 1032.4

$$\text{YTM} = r_1 + \frac{\text{PVCFAT} - \text{PV of cashoutlay}}{\Delta \text{ Pv of CFAT}} \times (r_2 - r_1) = 8 + \frac{1066.2 - 1032.4}{1066.2 - 939.8} \times (12 - 8)$$

$\boxed{\text{YTM} = 9.07\%}$

7. **Calculate the value and duration for the following bonds assuming a YTM of 8% for both ABC and XYZ.**

Bond	Years of Maturity	Annual Interest	Maturity Value
ABC	10	₹ 80	₹ 1000
XYZ	15	₹ 65	₹ 1000

Sol. :

i)   **ABC Bond**

Year	Cashflows	YTM @ 8%	PV of CFAT	W = PV of CFAT / V	D = $W_x Y_r$
1	80	0.926	74.08	0.074	0.074
2	80	0.857	68.56	0.068	0.136
3	80	0.794	63.52	0.063	0.189
4	80	0.736	58.88	0.059	0.236
5	80	0.681	54.48	0.054	0.27
6	80	0.631	50.48	0.050	0.3
7	80	0.584	46.72	0.047	0.329
8	80	0.541	43.28	0.043	0.344
9	80	0.501	40.08	0.040	0.36
10	80	0.464	37.12	0.037	0.37
10	1000	0.464	464	0.463	4.63
			V = 1001.2		7.238

$\therefore$ Value of the bond (V) = Rs. 1001.20, Duration of the bond = 7 yrs 2 months.

ii)   for XYZ :

Year	Cashflows	YTM @ 8%	PV of CFAT	$W = \dfrac{PV\ of\ CFAT}{V}$	$D = W_x Y_r$
1	65	0.926	60.19	0.072	0.072
2	65	0.857	55.71	0.066	0.132
3	65	0.794	51.61	0.061	0.183
4	65	0.736	47.84	0.057	0.228
5	65	0.681	44.27	0.053	0.265
6	65	0.631	41.02	0.049	0.294
7	65	0.584	37.96	0.045	0.315
8	65	0.541	35.17	0.042	0.336
9	65	0.501	32.57	0.039	0.351
10	65	0.464	30.16	0.036	0.36
11	65	0.397	25.81	0.031	0.341
12	65	0.368	23.92	0.028	0.336
13	65	0.341	22.17	0.026	0.338
14	65	0.315	20.48	0.024	0.336
15	65	0.292	18.98	0.023	0.345
15	1000	0.292	292	0.348	5.22
			V = 839.86		D = 9.452

Value of the bond = Rs. 839.86

Duration of the bond = 9 yrs 5 months

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8.   R.S. Verma is considering investing in a bond currently selling for Rs. 8,785.07. The bond has four years to maturity, a Rs. 10,000 face value, and a 8 percent coupon rate. The next annual interest payment is dur one year from today. The approximate discount factor for investments of similar risk is 10 percent.

(i)   Calculate the intrinsic value of the bond. Based on this calculation, should Verma purchase the bond ?

(ii)   Calculate the YTM of the bond. Based on this calculation, should Verma purchase the bond ?

Sol. :

(i)   The intrinsic value of a bond is equal to the discounted value of the cash flows.

$$V = \frac{Rs.\ 800}{(1+10)^1} + \frac{Rs.\ 800}{(1+10)^2} + \frac{Rs.\ 800}{(1+10)^3} + \frac{Rs.\ 10,800}{(1+10)^4}$$

$$= Rs.\ 727.27 + Rs.\ 66116 + Rs.\ 601.05 + Rs.\ 7,376.55$$

$$= Rs.\ 9,366.03$$

Because the bond is actually selling for Rs. 8,785.07, the bond is underpriced and Verma should purchase it.

(ii) The YTM is the interest rate that equates the price of the bond to the discounted value of the bond's cash flows. In mis particular problem :

$$Rs.\ 8785.07 = \frac{Rs.\ 800}{(1+YTM)^1} + \frac{Rs.\ 800}{(1+YTM)^2} + \frac{Rs.\ 800}{(1+YTM)^3} + \frac{Rs.\ 10,800}{(1+YTM)^4}$$

YRM = 12 percent

Because the YTM (12 percent) is greater than the appropriate discount rate (10 percent) for this bond, Verma should purchase it.

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9.   **(a)**   **An investor 'A' purchased a bond at a price of Rs. 900 with Rs. 100 as coupon payment and sold it at Rs.1000**

      (b)   **If the bond is sold for Rs. 750 after receiving Rs. 100 as coupon payment, then what is the holding period return ?**

Sol. :

a)   Holding period return $= \dfrac{\text{Price gain} + \text{Coupon Payment}}{\text{Purchase price}}$

$$= \frac{100 + 100}{900} = \frac{200}{900} = .2222$$

Holding period return = 22.22%

b)   Holding period return $= \dfrac{\text{Gain or loss} + \text{Coupon Payment}}{\text{Purchase price}}$

$$= \frac{-150 + 100}{900} = \frac{-50}{900} = -.0555$$

Holding period return = 5.5%

The current yield The current yield is the coupon payment as a percentage of current market price.

Current yield $= \dfrac{\text{Annual coupon payment}}{\text{Current market price}}$

With this measure the investors can find out the rate of cashflow from their investments every year. The current yield differs from the coupon rate, since the market price differs from the face value of the bond. When the bond's face value and market price are same, the coupon rate and the current yield would be the same. For example, when the coupon payment is 8% for Rs. 100 bond with the same market price, the current yield is 8% If the current market price is Rs. 80 then the current yield would be 10%

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10.   **Arvind considers Rs. 1000 par value bond bearing a coupon rate of 11% that matures after 5 years. He wants a minimum yield to maturity of 15%. The bond is currently sold at Rs. 870. Should he buy the bond ?**

Sol. :

$$P_0 = \frac{\text{Coupon}}{(1+Y)} + ... + \frac{\text{Coupon} + \text{Face value}}{(1+Y)^5}$$

$$P_0 = (\text{Coupon})\ (PVIFA, n) + (\text{Principal amount})\ (PVIF/k, n)$$

P_0 = 110 (PVIFA 15%, 5 years) + 1000 (PVIF/15%, 5 years)

= 110 (3.352) + 1000 (.497)

= 368.7 + 497 = 865.7.

At Arvind's anticipated minimum yield of 15% the price should be Rs. 865.70 but the market price is higher. Hence, he should not buy.

11.   Calculate the duration for bond 'A' and bond 'B' with 7% and 8% coupons having a maturity period of 4 years. The face value of the bonds are Rs. 1000/- and both the bonds are currently yielding 6%. Which one is advisable and why?

Sol. :

Calculation of Bond Duration

For Bond A

Year	Cash flows	PV @ 6%	PV of CFAT	$W_x = \dfrac{PV \text{ of CFAT}}{V_0}$	$MD = \Sigma W_x . \text{ year}$
1	70	0.943	66.01	0.064	0.064
2	70	0.89	62.3	0.060	0.12
3	70	0.839	58.73	0.057	0.171
4	70	0.792	55.44	0.054	0.216
4	1000	0.792	792	0.766	3.064
			$V_0 = 1034.48$		3.635

Bond duration = 3.635 yrs.

For Bond B

Year	Cash flows	PV @ 6%	PV of CFAT	$W_x = \dfrac{PV \text{ of CFAT}}{V_0}$	$MD = \Sigma W_x . \text{ year}$
1	80	0.943	75.44	0.071	0.071
2	80	0.89	71.2	0.067	0.134
3	80	0.839	67.12	0.063	0.189
4	80	0.792	63.36	0.059	0.236
4	1000	0.792	792	0.741	2.964
			$V_0 = 1069.12$		3.594

Bond duration = 3.594 yrs.

Since the Bond A duration is less than Bond B. It is advisable to select Bond A

12. **A bond with face value of ₹ 1000 has left over period of maturity of 4 years. Its coupon rate is 8% and YTM is 10%. Calculate Macaulay's Duration and Modified Duration.**

Sol :

Macaulay's Duration

CF = Cash flows i.e., coupon amount

= ₹ 80

Received in year 1, 2 and 3 but in 4th year it is coupon amount and principal.

I. Calculation of Price of a Bond

Year	CFs	PVIF@10%	PV_s
1	80	0.9091	72.73
2	80	0.8264	66.11
3	80	0.7513	60.10
4	1080	0.6830	737.64
		Bond price, P_0 = 936.58	

II. Determination of Macaulay's Duration

Year	PVCF (PV_s)	PVCF as Proportion of $(W_i) = \dfrac{PV_s}{P_0}$	$n \times W_i$
1	72.73	0.0777	0.0777
2	66.11	0.0706	0.1412
3	60.10	0.0641	0.1923
4	737.64	0.7876	3.1504
	P_0 = 936.58		MD = 3.5616

∴ Macaulay's duration = 3.65 years

Modified Duration

$$MMD = \frac{MD}{1 + YTM}$$

$$= \frac{3.56}{1 + 0.10} = \frac{3.56}{1.10} = 3.24 \text{ years}$$

13. **A bond of ₹1000 face value, bearing a coupon rate of 12 per cent, will mature after seven years. What is the value of the bond if the discount rates are 14 per cent and 12 per cent?**

Sol :

P_o = C (PVIFA k,n) + F (PVIF k,n)

= 120 (PVIFA 14%, 7 years) + 1,000 (PVIF k,n)

= 120 (4.288) + 1000 (.400)

= 514.56 + 400 = ₹ 914.56

P_o = 120 (PVIFA 12% 7 years) + 1,000 (PVIF 12%, 7 years)

    = 120 (4.564) + 1000 (0.452)

    = 547.68 + 452

    = ₹ 999.68

14. Anand owns ₹1,000 face value bond with five years to maturity. The bond has an annual coupon of ₹ 75. The bond is currently priced at ₹ 970. Given an appropriate discount rate of 10 per cent, should Anand hold or sell the bond ?

Sol :

P_o = Coupon (PVIFA k,n) + Principal amount (PVIF k,n)

    = 75 (PVIFA 10%, 5 years) + 1000 (PVIF 10%, 5 years)

    = 75 × 3.7908 + 1000 (0.6209)

    = ₹ 284.31 + 620.9

    = ₹ 905.21

The market price of ₹ 970 is higher than the estimated price ₹ 905.2. It is better for Anand to sell the bond.

Short Questions and Answers

1. Define Maturity

Ans :

Maturity of a bond refers to the date, on which the bond matures, which is the date on which the borrower has agreed to repay the principal. Term-to-Maturity refers to the number of years remaining for the bond to mature. The Term-to-Maturity changes everyday, from date of issue of the bond until its maturity.

2. Define Coupon

Ans :

Coupon refers to the periodic interest payments that are made by the borrower (who is also the issuer of the bond) to the lender (the subscriber of the bond). Coupon rate is the rate at which interest is paid, and is usually represented as a percentage of the par value of a bond.

3. Define YTM

Ans :

The concept of yield-to-maturity (YTM) is one of the widely used tools in bond investment management. Arithmetically, YTM is the single discount factor that makes present value of future cashflows from a bond equal to the current price of the bond. Intuitively, YTM is the rate of return, which an investor can except to earn if the bond is held till maturity.

The yield to maturity is calculated based on certain assumptions. They are :

1. There should not be any default. Coupon and principal should be paid as per schedule.

2. The investor has to hold the bond till maturity.

3. All the coupon payments should be reinvested immediately at the same interest rate as the same yield to maturity of the bond.

4. Define Coupon Yield

Ans :

Coupon Yield or Nominal Yield, is also referred to as the Coupon Rate in the Bond Market parlance. As already mentioned above, this type of Bond Yield is calculated at the end of a financial year and is paid as a fixed coupon amount on the original face value of the particular bond.

5. Define Current Yield

Ans :

Current Yield, in contrast to the Coupon Yield or Nominal Yield, is a Bond Yield that is determined by dividing the fixed coupon amount (that is paid as a percentage on the face or original value of the specific bond) by the current price value of the particular bond. In other words,

Current Bond Yield = Coupon amount / current price of a bond.

6.   Define Holding Period of Return

Ans :

Holding period return an investor buys a bond and sells it after holding for a period. The rate of return in that holding period is :

$$\text{Holding period return} = \frac{\text{Price gain or loss during the holding period} + \text{Coupon interest rate, if any}}{\text{Price at the beginning of the holding period}}$$

The holding period rate of return is also called the one period rate of return. This holding period return can be calculated daily or monthly or annually. If the fall in the bond price is greater than the coupon payment the holding period return will turn to be negative.

7.   Define Deep Discount Bond (Or) Zero Coupon Bond

Ans :

Valuation of Deep Discount Bonds

The deep discount bond does not carry any interest but it is sold by the issuer company at deep discount from its eventual maturity (nominal) value. The Industrial Development Bank of India (IDBI) issued such DDBs for the first time in the Indian capital market at a price of Rs. 2700 against the nominal value of Rs. 1,00,000 payable after 25 years. Since there is no intermediate payment of interest between the date of issue and the maturity date, these DDBs may also be called zero coupon bonds (ZBBs).

8.   Define Macaulay's Duration (MD).

Ans :

The formula usually used to calculate a bond's basic duration is the Macaulay duration, which was created by Frederick Macaulay in 1938, although it was not commonly used until the 1970s. Macaulay duration is calculated by adding the results of multiplying the present value of each cash flow by the time it is received and dividing by the total price of the security. Macaulay duration, named for Frederick Macaulay who introduced the concept, is the weighted average maturity of a bond where the weights are the relative discounted cash flows in each period.

$$\text{Macaulay Duration} = \frac{\Sigma(\text{Cashflow discovered with yield to maturity} \times \text{Time to cashflow}}{\text{Price of the bond}}$$

9.   Define Bond Immunisation

Ans :

Bond Immunization

Bond immunization strategy is a strategy to derive a specified rate of return regardless of what happens to market interest rates over holding period.

Seeks to offset the opposite changes in bond valuation caused by price effect and reinvestment effect

➤   **Price Effect :** change un bond value caused by interest rate changes

➤   **Reinvestment Effect :** as coupon payments are received, they are reinvested at higher or lower rates that original coupon rate.

Bond immunization occurs when the average duration of the bond portfolio just equals the investment time horizon. Bond immunization minimizes risk

10.   Define Interest Rates.

Ans :

Another reason for variation in the returns from bonds is the change in market interest rates. An investor in bonds receives interest annually or semi-annually. He reinvests these interest amounts each year at the market interest rate. Thus, interest is earned on the interest received from the bonds each year. Finally, at the end of a certain holding period, the investor may sell off the bond at a price which is equal to its face value.

The opposite would be true when the market interest rate moves down. The investor would be able to reinvest the interest only at lower rate than what was expected. However, the bond price will move above its face value as the market interest rate declines. The investor loses on reinvestment of interest but gains on selling the bond.

11.   YTC

Ans :

Yield to call (YTC) is a financial term that refers to the return a bondholder receives if the bond is held until the call date, which occurs sometime before it reaches maturity. This number can be mathematically calculated as the compound interest rate at which the present value of a bond's future coupon payments and call price is equal to the current market price of the bond.

Yield to call applies to callable bonds, which are debt instruments that let bond investors redeem the bonds–or the bond issuer to repurchase them–on what is known as the call date, at a price known as the call price. By definition, the call date of a bond chronologically occurs before the maturity date.

12.   Factors involved in bond valuation

Ans :

i)   Interest Rate changes

ii)   Economic Conditions

iii)   Inflation Expectations

iv)   Market Liquidity

v)   Credit Rating changes

vi)   Issuer's Financial Health

Exercise Problems

1. A four year bond with a 7% coupon rate and maturity of Rs. 1000 is currently selling at Rs. 905. What is its yield to maturity?

   [Ans : Current price [P_0] = 90.5, Yield to Materials (XT_M) = 10%]]

2. Rahul recently purchased a bond with a Rs. 1000 face value, at 10% coupon rate and four years to maturity. The bond makes annual interest payments, the first to be received one year from today. Mr. Rahul paid Rs. 1032 for the bond. What is the bond's yield to maturity ?

   [Ans : Current Market Price [P_0] = 1032, Yield to Maturity (XTM) = 18.55%]

3. A 10 year bond with 14% coupon rate and with maturity value of Rs. 100 is currently selling at Rs. 80. What is its yield to maturity?

   [Ans : Present value (P_0) = 18.55, Yield to Maturity (YTM) = 14.74%]]

4. The Madsoft Company recently issued a Rs. 1000,12% semiannual bond with 20 years of maturity (a) What will be the price of the bond, if the market rate of interest is 14%? (b) Determine the bond's Macaulay's duration when it was issued and (c) Two years later.

   [Ans: Current Price [P_0] = 866.70, Macaulay's Duration (MP) = 7.279%]]

5. Mr. Parthik will be making a car payment of Rs. 316 per month for the next 4 years. If the rate of interest on his loan is 1% per month, what is the duration of the loan?

   [Ans: Macaulay's Duration (MD) = 22.5%]]

6. Strong muscles sports equipment had issued a 14% semiannual bonds with a life of 15 years and a face value of Rs. 600. These bonds are currently available for Rs. 690 and have 12 more years for maturity. Find the YTM.

   Further, if the bond is callable five years from now at a premium of 15% on its face value, find the YTC.

   [Ans: [Yield to Call = 12.37]]

Choose the Correct Answers

1. The marketability risk of a bond is _____.   [b]
    (a) the market risk which affects all the bonds
    (b) variation in return caused by the difficulty in selling bonds
    (c) the failure to pay the agreed value of the bond by the issuer
    (d) a and b

2. Default risk is lower in _____.   [a]
    (a) treasury bills   (b) government bonds
    (c) ICICI Bonds   (d) IDBI bonds

3. The value of the bond depends on _____.   [d]
    (a) the coupon rate   (b) years to maturity
    (c) expected yield to maturity   (d) all the above

4. The bond yield remains constant over its life and the discount or premium amount will decrease _____.
                                                                                                   [c]
    (a) at a decreasing rate as its life gets shorter   (b) at a decreasing rate as its life gets longer
    (c) at an increasing rate as its life gets shorter (d) at an increasing rate as its life gets longer

5. Yield to maturity is the single factor that makes _____.   [c]
    (a) the future value of the present cash flows from a bond equal to bond value
    (b) the future value of present cash flows equal to the future price of the bond
    (c) present value of the future cash flows of the bond equal to the current price of the bond
    (d) the future value of the bond equal to the present price

6. The term structure of the bond is the relationship between the _____.   [d]
    (a) interest rate and the bond's maturity period
    (b) interest rate of the bond and market rate of interest
    (c) interest rate and the price of the bond
    (d) yield and time taken to mature

7. Riding the yield curve means _____.   [a]
    (a) switching from short-term bonds to long-term ones when the latter yield gets better
    (b) switching from bonds to stocks
    (c) switching from long-term bonds to short-term ones for a higher yield
    (d) switching to short-term bonds from long-term ones when the yield curve is downward sloping

8. Coupon yield of the bond is _____.   [c]
    (a) the discounted value of the bond
    (b) coupon payment stated as a percentage of a bond's features
    (c) coupon payment stated as a percentage of a bond's present price
    (d) (a) and (c)

9. The bond portfolio manager has to watch carefully _____.   [c]
    (a) the shape of the yield curve
    (b) the market interest rate
    (c) the shape of the yield curve and shifts that occur in the market interest rate
    (d) the repaying capacity of the issuers

10. Duration is the measure of the _____.   [d]
    (a) time structure of the bond   (b) interest rate risk
    (c) time structure and market risk   (d) time structure and the interest rate risk

Fill in the Blanks

1. _____ with banks are the safest mode of investment and earns a fixed rate of interest.

2. A deep discount bond is another form of zero _____ bond.

3. YTM stands for _____.

4. AYTM stands for _____.

5. _____ is an estimated measure of the price sensitivity of a bond to a change in interest rates.

6. _____ is also useful for comparing bonds. If two bonds offer the same duration.

7. Bonds that do not mature or never mature are called _____ bonds.

8. _____ rates are usually considered as the price for loanable funds.

9. _____ Yield, in contrast to the Coupon Yield.

10. _____ is generally calculated at the end of the term for which the bond was issued in the Bond Market.

ANSWERS

1. Deposits
2. Coupon
3. Yield to Maturity
4. Approximate Yield to Maturity
5. Duration
6. Convexity
7. Perpetual
8. Interest
9. Current
10. YTM

Very Short Questions and Answers

1.   What is Bond Yields?

Ans :

Bond Yield may be defined as the rate of interest that is paid by the company issuing bonds to the owner of a particular bond. The Bond Yield for any specific bond, is commonly determined by dividing the effective coupon rate of a bond by its current market price.

2.   Holding Period Return

Ans :

An investor buys a bond and sells it after holding for a period. The rate of return in that holding period is calculated as follows:

$$\text{Holding period return} = \frac{\text{Price change} + \text{Coupon interest}}{\text{Price at the beginning of the holding period}}$$

3.   Yield to Maturity (YTM)

Ans :

The concept of Yield to Maturity (YTM) is one of the widely used tools in bond investment manage-ment. The current way of computing the return on any asset involves considering the entire sequence of cash flows with their timing and calculating the internal rate of return.

4.   Macaulay's Duration.

Ans :

A bond's basic duration is the Macaulay duration, which was created by Frederick Macaulay in 1938, although it was not commonly used until the 1970s. Macaulay duration is calculated by adding the results of multiplying the present value of each cash flow by the time it is received and dividing by the total price of the security.

5.   Active Bond Management

Ans :

Active bond management need to adopt more/ enhanced investment strategies so as to attain effective bond portfolio.

Equity Valuation:

a) Intrinsic Value versus Market Value, Equity Valuation Models-Discounted Cash Flow Techniques, Dividend Discount Models (DDM), Growth Rate cases for DDM, Free Cash Flow Valuation Approaches, Relative Valuation Techniques, Earnings Multiplier Approach, Price/ Earnings, Price/ Book Value, Price/ Sales Ratio, EVA.

b) Fundamental Analysis, Technical Analysis, Efficient Market Hypothesis.

4.1 EQUITY ANALYSIS AND VALUATION

Q1. What is equity valuation ? Explain the scope of equity valuation.

Ans : (April-23, Dec.-19, Imp.)

Meaning

A stock is a security which possess an ownership in the form of shares. If lends to someone then it would be in the form of bonds and debentures. This is declared publicly.

Stocks are classified in two types, namely,

1. Preferred stocks
2. Common stocks.

Shareholders who possess preference stocks are given first priority at the time of rendering profits when compared to shareholders who possess common stocks. Therefore, preferred stocks have an edge over the common stocks.

Equity shares are quite easier to be explained than the fixed income securities, but it is quite difficult to be ascertained. The fundamental principles of evaluating the equity shares is similar to the fixed income securities, valuation. In case of equity shares, the factors relating to growth and risk results in greater complexities.

Scope

Investment analysts work in a wide variety of organizations and positions; as a result, they find themselves applying the tools of equity valuation to address a range of practical problems. In particular, analysis uses valuation concepts and models to accomplish the following:

1) Selecting Stocks

Stock selection is the primary use of the tools of equity valuation. Equity analysts must continually address the same question for every common stock that is either a current or prospective portfolio holding or for every stock that he or she is professionally assigned to analyze.

2) Inferring (Extracting) Market Expectation

Market prices reflect the expectations of investors about the future prospects of companies. Analysts may ask what expectations about a company's future performance are consistent with the current market price for that company's stock. This question may concern the analyst for several reasons:

i) There are historical and economic reasons that certain values for earnings growth rates and other company fundamentals may or may not be reasonable. (Fundamentals are characteristics of a company related to profitability, financial strength or risk.)

ii) The extracted expectation for a fundamental characteristic may be useful as a benchmark or comparison value of the same characteristic for another company.

3) Evaluating Corporate Events

Investment bankers, corporate analysts and investment analysts use valuation tools to assess the impact of corporate events such as mergers, acquisitions, divestitures, spin-offs, Management Buy-Outs (MBOs) and leveraged recapitalizations. Each of these events may affect a company's future cash-flows and so the value of equity. Furthermore, in mergers and acquisitions, the company's own common stock is often used as currency for the purchase; investors then want to know whether the stock is fairly valued.

4)   Seeking Fair Opinions

The parties to a merger may be required to seek a fair opinion on . The terms of the merger from a third party such as an investment bank. Valuation is at the center of such opinions.

5)   Evaluating Business Strategies and Models

Companies concerned with maximizing shareholder value must evaluate the impact of alternative strategies on share value.

6)   Communicating with Analysts and Shareholders

Valuation concepts facilitate communication and discussion among company management, shareholders and analysts on a range of corporate issues affecting company value.

4.1.1 Intrinsic Value versus Market Value

Q2. Explain briefly about Intrinsic Value and Market Value.

Ans :

1.   Intrinsic Value

(i)   Intrinsic value is an approximation of a company's actual true value. It does not depend on market value.

(ii)   Intrinsic value is one of the core metrics used to evaluate a company's worth. The basic ideology is to make investments in companies that have a higher intrinsic or true value instead of those whose value is dictated by the market.

(iii)   Intrinsic value can be considered to be a part of fundamental analysis. While estimating the intrinsic value, both tangible and intangible parameters are considered.

(iv)   This includes market analysis, financial statements, and the business plan of the company. It is fairly a complicated procedure that one will have to go through when estimating the intrinsic value of a company. As there exist various variables such as the intangible assets of the company, the approximation of the true value of a given company may vary vastly across analysts.

(v)   A few analysts will make use of the discounted cash flow analysis to cover future earnings in their calculation while some consider only the current liquid value or the book value which is reflected in the company's latest balance sheet.

(vi)   Furthermore, challenges arise from the balance sheets themselves. This is due to the fact that the balance sheets are prepared internally by the company and may not always accurately represent the assets and liabilities.

2.   Market Value

(i)   The market value of a company is its value as represented by the share price of the company. Hence, market value can be considerably lower or higher than the company's intrinsic value.

(ii)   The market value is often used to represent the market capitalization of a listed company and is calculated by obtaining the product of the current share price and the number of outstanding shares of the company.

(iii)   One should always know that the market value of a company is obtained from its present share price, and it does not always reflect the accurate worth of the company.

(iv)   Therefore, the market value of a company can be considered just as an estimate of public sentiment towards the company.

(v)   This is because of the fact that the market value represents the demand and supply in the market, and how interested the investors are when it comes to investing in the company.

(vi)   Another major difficulty in estimating the market value of the company comes when one has to account illiquid assets such as its real estate and other business operations.

(viii) The market value of a company is higher than its intrinsic value when there exists a strong demand for investments which will lead to overvaluation.

Q3. Compare and contrast Intrinsic Value and Market Value

Ans :

S.No.	Parameter	Intrinsic Value	Market Value
1.	Definition	Actual value of the company, and depend on the share price	It is represented the current share price
2.	The asset is undervalued and should be purchased when	Higher	Lower
3.	The asset is overvalued and should be sold when	Lower	Higher
4.	Valuation is correct	Intrinsic value = market value	Intrinsic value = market value

4.2 EQUITY VALUATION MODELS

Q4. Discuss about various Equity Valuation Models.

(OR)

Describe the equity valuation models.

Ans :   **(April - 23, Dec.-19, Imp.)**

Following are the Equity Valuation Models.

i)   Book Value

The book value per share is simply the net worth of the company (which is equal to paid up equity capital plus reserves and surplus) divided by the number of outstanding equity shares).

ii)   Liquidation Value

The liquidation value per share is equal to:

Value realized from liquidating Amount to be paid to all the creditors and

Value realised from liquidating all the assets of the firm	-	Amount to be paid to all the creditors and preference shareholders
Number of outstanding equity shares		

iii)   Replacement Cost

Replacement cost of its assets minus liabilities is the another balance sheet measure which considered by various analysts while valuing a firm. The application of this measure is on the assumption basis that the market value of a firm must not vary too much from its replacement cost. Otherwise the competitive pressure result to align the two. Such idea appears to be famous between economists. The ratio of market price to replacement cost is known as Tobin q, after James Tobin, a Nobel Laureate in economics.

4.2.1 Discounted Cash Flow Techniques, Dividend Discount Models (DDM), Growth Rate cases for DDM

Q5. Discuss about dividend discount models in detail.

Ans :   (April -23, Imp.)

Dividend Discount Model

For an equity share, the payments are in the form of dividends declared by the company.

As the equity is a perpetual security i.e., with no maturity date, the dividend payments are made periodically throughout its infinite life. Incase the intrinsic value estimate is more than the stock's current market price, then the stock must be purchased. If the current market price is more than the intrinsic value estimate then the stock must be sold out. So, the 'intrinsic' or 'true' value of a share is represented by the equation.

$$P_0 = \frac{D_1}{(1+k_e)} + \frac{D}{(1+k_e)} + ... + \frac{D_t}{(1+k_e)}$$

$$= \sum_{t=1}^{n} \frac{D_t}{(1+k_e)^t}$$

Where,

D_t = Dividend payment at time t

k_e = Equity capitalization rate

P_0 = Present value of a share (intrinsic value).

Therefore, the value of an asset is the present value of all cash flow an investor expects from that asset and this approach is known as dividend capitalization model.

Dividend discount model while applying, assume the following,

(i)   The dividends are paid annually.

(ii)   The first dividend is received after one year and

(iii)   The resale occurs at the end of the year.

It is also known as capitalization of income method. The intrinsic value of an equity share depends on the dividends declared by the company. This model can be broadly classified for simplicity's sake into,

(i)   Single period valuation models and

(ii)   Multiple-period valuation models.

In these models, the infinite stream of future dividends are valued for the present as price dividends ratio. If the net earnings are assumed to be the same as dividends and no retained earnings, then the price-dividends ratio contracts to price earnings ratio.

1.   Single Period Valuation Models

Suppose the investor expects to hold the equity share for one year, then the price of the equity share is,

$$P_0 = \frac{D_1}{(1+k)} + \frac{P_1}{(1+k)} = \frac{D_1 + P_1}{(1+k)}$$

Where,

P_0 = The current price

P_1 = Price after an year

D_1 = The dividend after a year

k = The required rate of return.

2.   Multiple Growth Model

Multiple growth model of dividends valuation is one of the dividend growth models which can be mostly use to value the stocks. In this model, dividends tend to grow at different growth rates for different time periods. In this model, Investor needs to estimate or forecast the dividend rate at a time in future (T). Beyond this time period there will be a consistent growth in the dividends. The investor should also forecast the constant rate of dividend growth after a particular period of time in future.

The following equations represent the time duration and the growth rate of dividends in the multistage growth model,

$D_{T+1} = D_T(1 + g)$

$D_{T+2} = D_{T+1}(1 + g)$ or $D_T(1 + g)^2$

$D_{T+3} = D_{T+2}(1 + g)$ or $D_T(1 + g)^3$

In multiple stage growth model, the value of the stock can be determined by,

$$P_0 = \left[\frac{D_1}{(1+k)^1} + \frac{D_2}{(1+k)^2} + \frac{D_3}{(1+k)^3} + \ldots\ldots + \frac{D_T}{(1+k)^T} + \frac{D_{T+1}}{(k-g)(1+k)^T} \right]$$

Where

D_1 = Dividend rate for the first period

D_2 = Dividend rate for the second period

D_T = Dividend rate after 'T time period

k = Cost of capital

g = Growth rate.

In this model, there are three stages which includes stages,

1.   Initial stage which is characterized by a stable high growth

2.   Transition stage wherein growth rate declines

3.   Final stage is characterized by a constant or sustainable growth rate of dividends.

4.2.2 Free Cash Flow Valuation Approaches

Q6.   What is free cash flow model? Discuss the procedure involved in it.

Ans :   *(April - 23, Dec.-19, Imp.)*

Meaning

Free cash flow model deals with the evaluation of firms value i.e., value of equity with the help of the discounting factor. The free cash flow to investors must be multiplied with the discounting factor and the obtained value is deducted from the value of preference and debt.

Procedure

Free cash flow model entails the following procedure as follows,

Step 1: Divide the Future into Two Periods, the Explicit Forecast Period and the Balance Period

Duration of explicit forecast period ranges from 5 to 15 years which represents the period within which the firm is expected to evolved and grown. So as to reach at the stable level. The stability of the firm is characterized by stable return on invested capital [or return on capital employed], growth rate and the cost of capital.

Step 2: Forecast the Free Cash Flow, Year by Year During the Explicit Forecast Period

The Free Cash Flow (FCF) refers to the net cash flows available with the firm after distributing them to the capital providers (shareholder and debt holders) and after making investments in fixed assets and net working capital. The amount of free cash flows plays a vital role in the growth and development of the firm.

The FCF is calculated as,

$$\boxed{\text{NOPAT - Net investment}}$$

Where, (NOPAT) refers to Net Operating profit adjusted for Taxes.

NOPAT = Profits/Earnings before interest and tax [1 - tax rate].

Whereas, the net investment is equal to,

$$\boxed{\text{Change in net fixed assets + Change in net working capital}}$$

Step 3: Computation of the Weighted Average Cost of Capital [WACC]

The weighted average cost of capital is an aggregation of multiple costs overheads utilized by the company. Most commonly used costs include the post-tax cost of equity, preference and debt.

$$\boxed{\text{WACC} = w_q r_q + w_f r_f + w_e r_e \ (1\text{-}t)}$$

Where,

w_q, w_f, w_e are the weights related with equity, preference and debt.

r_q, r_f, r_e are the costs related with equity, preference and debt.

Note

Cost of debt 'r_e' is obtained after tax as interest on debt is a tax-deductable payment.

Stop 4: Establish the Horizon Value of the Firm

The value set on the firm's asset at the end of the explicit forecast period (N years) is usually termed as the "horizon value" [υ_N] where, FCF grows at a constant rate of 'g' beyond N then the horizon value is found to be,

$$\boxed{\upsilon_N = \frac{\text{FCF}_{N+1}}{\text{WACC} - g}}$$

Step 5: Evaluate the Enterprise Value

Enterprise value is also called as the firm value which is the combination of the present value of FCF during the explicit forecast period and the present value of the horizon value. Enterprise value will be,

$$\boxed{\text{EV} = \frac{\text{FCF}_1}{(1 + \text{WACC})} + \frac{\text{FCF}_2}{(1 + \text{WACC})^2} + ... + \frac{\text{FCF}_N}{(1 + \text{WACC})^N} + \frac{\upsilon_N}{(1 + \text{WACC})^N}}$$

Present value of the FCF during explicit forecast period   Present value of the horizon value

Stop 6: Derive the Equity Value

Equity value is equal to,

Enterprise value - Preference value - Debt value

Stop 7: Determination of the Value Per Share

Value per share is determined as,

Equity
Number of outstanding equity share

PROBLEMS

1. **The company ABC's next year dividend per share is expected to be Rs. 3.50. The dividend in subsequent years is expected to grow at a rate of 10 per cent per year. If the required rate of return is 15 per cent per year, what should be its price ? The prevailing market price is Rs. 75.**

Sol. :

$$P_0 = \frac{D_1}{r - g}$$

$D_1 = 3.50$

$r = 0.15$

$g = 0.10$

$$= \frac{3.5}{.05}$$

$$= \text{Rs. } 70$$

The investor would be willing to pay Rs. 70 for the share. Since the theoretical price is less than the market price, the investor is advised not to buy.

2. **An investor owns the share of Rise company whose current cash dividend is Rs. 3. The constant growth rate is dividend is 16 per cent per year and the required rate of return is 20 per cent. What is the value of the Rise company's share ?**

Sol. :

We have to use cash dividends expected one year hence.

$$P_0 = \frac{D_1}{(K + g)} + \frac{D_0 (1 + g)}{(K - g)}$$

$$= \frac{3.000 (1 + .16)}{0.20 - 0.16}$$

$P_0 = \text{Rs.} 87$

3. **Antique Arts Company would pay Rs. 2.50 as dividend per share for the next year and expected to grow indefinitely at 12%. What would be the equity value if the investor requires 20% return ?**

Sol. :

$$P_0 = \frac{D_1}{K - g}$$

D_1 = 2.50 (next year dividend)

K = 20%

g = 12%

$$= \frac{2.5}{0.20 - 0.12} = 31.25$$

4. **The equity share of a company sells for Rs. 23 per share and the anticipated growth rate in dividends is Rs. 10.5 percent. In the current year it has paid a dividend of Rs. 2.50 per share.**

   a) **What is the expected rate of return ?**

   b) **If the investor requires a 17% return, should he purchases the stock ?**

Sol. :

Current selling price of share (P_0) = Rs. 23

     Growth rate = 10.5%

Current year dividend (D_0) = Rs. 2.5

$$\begin{aligned} D_1 &= D_0\,(1+9) \\ &= 2.5\,(1+0.105) \\ D_1 &= \text{Rs. } 2.7625 \end{aligned}$$

Expected return (k_e) = ?

$$P_0 = \frac{D_1}{K_e - g}$$

$$23 = \frac{2.7625}{K_e - 0.105}$$

$23\,(K_e - 0.105) = 2.7625$

$23\,K_e - 2.415 = 2.7625$

$23\,K_e - 2.7625 + 2.415$

$23\,K_e - 5.1775$

$$K_e = \frac{5.1775}{23} = 0.225$$

$Ke = 22.5$

when the required rate of return is 17%

$$P_0 = \frac{D_1}{K_e - g}$$

$$P_0 = \frac{2.7625}{0.17 - 0.105} = \frac{2.7625}{0.065}$$

$$\boxed{P_0 = 42.5}.$$

5. **Ashok wants to buy Watchful company's stock and hold on it for five years. He estimates that Rs. 3.44 dividend would be paid by the company continuously for the next five years. He hopes to sell the shares at Rs. 60 at the end of the fifth year. What is the present price? His required rate of return is 10%.**

Sol. :

$$P_0 = \frac{D_1}{(1+r)^1} + \frac{D_2}{(1+r)^2} + \frac{D_3}{(1+r)^3} + \frac{D_4}{(1+r)^4} + \frac{D_5}{(1+r)^5} + \frac{P_n}{(1+r)^5}$$

$$P_0 = \frac{3.44}{(1.1)^1} + \frac{3.44}{(1.1)^2} + \frac{3.44}{(1.1)^3} + \frac{3.44}{(1.1)^4} + \frac{3.44}{(1.1)^5} + \frac{60}{(1+0.1)^5}$$

$$P_0 = \frac{3.44}{(1.1)^1} + \frac{3.44}{(1.21)^2} + \frac{3.44}{(1.331)^3} + \frac{3.44}{(1.4641)^4} + \frac{3.44}{(1.6105)^5} + \frac{60}{(1+6105)^5}$$

$$= 3.13 + 2.84 + 2.58 + 2.35 + 2.14 + 37\,25$$

$$= Rs.\ 50.29$$

6. **Vigilent company stock is currently selling at Rs.25 per share. The stock is expected to pay Rs.1 as dividend per share at the end of the next year. It is reliably estimated that the stock will be available for as Rs. 29 at the end of one year.**

   a) **If the forecasts about the dividend and price and accurate, is it advisable to buy at the present price? His required rate of return is 20%**

   b) **If the investor requires 15% return when the dividend remains constant what should be the price at the end of the first year?**

Sol. :

(a) $$P_0 = \frac{D_1}{1+r} + \frac{P_1}{1+r}$$

$$= \frac{1}{1.2} + \frac{29}{1.2} = 0.833 + 24.16$$

$$P_0 = Rs.25.0$$

Since the estimated price and the actual price are equal, the investor could buy it.

(b) $$P_0 = \frac{D_1}{1+r} + \frac{P_1}{1+r}$$

$$25 = \frac{1}{1.15} + \frac{P_1}{1.15}$$

$$25 = .87 + \frac{P_1}{1.15}$$

$$25 - 0.87 = \frac{P_1}{1.15}$$

$$P_1 = 24.13 \times 1.15$$

$$P_1 = 27.75$$

The value of the stock at the end of the period should be Rs. 27.75, if the required rate of return is 15%.

7. **The return of ABC Company at present is 21 percent. This is assumed to continue for the next five years and after that it is assumed to have a growth rate of 10 percent indefinitely. The dividend paid for the year 2011 - 12 is 32 percent. The required rate of return is 20 percent and the present price is ₹57. What is the estimated price according to the two stage model ?**

Sol. :

$$P_0 = \sum_{t=1}^{N} \frac{D_0 (1+g_s)^t}{(1+r_s)} + \frac{D_{N+1}}{(r_s - g_n)} \times \frac{1}{(1+r_s)^N}$$

$D_0 = ₹3.2$

$g_s = 21\%$ or 0.21

$g_n = 10\%$ or 0.10

$r_s = 20\%$ or 0.20

$N = 5$ years

Step 1

$$P_0 = \sum_{t=1}^{N} \frac{D_0 (1+g_s)^t}{(1+r_s)^t}$$

$$= \frac{3.2(1+0.21)}{(1+0.2)^1} + \frac{3.2(1.21)^2}{(1+0.2)^2} + \dots \frac{3.2(1.21)^5}{(1+0.2)^5}$$

$$= \frac{3.872}{1.2} + \frac{4.6851}{1.44} + \frac{5.669}{1.728} + \frac{6.8595}{2.0736} + \frac{8.3}{2.4883}$$

$$= 3.2267 + 3.2535 + 3.2807 + 3.3080 + 3.3356$$

$$= 16.4045$$

Step 2

$$\frac{D_{N+1}}{(r_s - g_n)} \times \frac{1}{(1+r_s)^N}$$

$$= \frac{8.3 \times (1.10)}{0.20 - 0.10} \times \frac{1}{(1+0.2)^5}$$

$$= \frac{91.3 \times 1}{2.4883} = ₹36.69$$

Step 3

$P_0 = 16.4045 + 36.69$

$P_0 = ₹ 53.09$

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4.3 Relative Valuation Techniques

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4.3.1 Earnings Multiplier Approach, Valuation using P/E ratio

Q7.   Explain in detail various techniques of relative valuation.

Ans :   **(Dec.-18, Imp.)**

Equity analysis use the following measures of relative value

1.   Price Earnings Ratio

For answer refer unit - IV, Q.No. 8

2.   Price /Book Value Ratio

For answer refer Unit - IV, Q.No. 9

3.   Price / Sales Ratio

For answer refer Unit - IV, Q.No. 10

Q8.   Discuss briefly about P/E Ratio (or) Earnings Multiplier Approach.

Ans :   **(April-23, Imp.)**

Price-earnings ratios are used to estimate the value of the stocks by the investors rather than adopting the discounting models. Every financial magazine and the newspaper at regular interval publish price earnings per share. The P/E ratio models have three distinct advantages over the discounting models.

1.   P/E ratios indicates price per rupee of share earnings. This would help to compare the prices of stocks, which have different earnings per share.

2.   P/E ratios are helpful in analyzing the stocks of the companies that do not pay dividend but have earnings. It should be noted that when there is a loss, the P/E ratio analysis is difficult to use.

3.   The variables used in P/E ratio models are easier to estimate than the variables used in the discounting model.

We know that, by definition

D = E (1 – b), where D is dividend per share,

E is earning per share and

b is the earnings retention rate [(1 - b) is the dividend payout ratio]. Therefore, an equivalent earnings based valuation model is,

$$\boxed{P_0 = \frac{E_1(1 - b)}{k - g}}$$

Where,

P_0 = Stocks present value

E_1 = Expected earnings at the end of year 1

b = Retention rate

g = Expected growth rate and

k = Required rate of return.

It is also true that $E_1 = E_0 (1+g)$, where E_0 is current earnings per share. The above equation can be stated in terms of P/E ratio as follows,

$$\frac{P_0}{E_0} = \frac{(1+g)\left(\dfrac{D_0}{E_0}\right)}{k-g}.$$

Determinants of the P/E Ratio

Initially, estimated value of a stock need to be considered which is denoted as P and in terms of a constant growth of dividends discount model.

$$\therefore \quad P_0 = \frac{D_1}{k-g}$$

Divided both sides of equation (1) with E_1, which is expected earnings of year 1.

$$\frac{P_0}{E_1} = \frac{D_1/E_1}{k-g}$$

P/E ratio depends on the factors present in equation (2).

Where,

D_1/E_1 = Expected dividend payout ratio

g = Expected growth rate of dividends

k = Required rate of return.

PIE ratio exists in a relationship with the above three factors in the following way.

Other things being equal;

i)   The P/E ratio would be higher, when the expected payout ratio is high (D_1/E_1).

ii) PIE ratio would be higher, when the expected growth rate, g is high,

iii) PIE ratio would be low, when the required rate of return, k is too high.

It is necessary for the other things to be equal. If they are not equal then the above mentioned relationships do not exist because *P/E* ratio would be effected to a large extent with a small change in these relationships.

PROBLEMS

8. **The Logan corporation currently has earnings that are Rs. 4 per share. In recent years, earnings have been growing at a rate of 5% and will continue in future. If 40% is the retention rate and required rate of return is 14%, what is its current value ?**

Sol :

Given that,

E_0 = Rs. 4.00, g = 0.05

b = 0.40 and k = 0.14

$$P_0 = \frac{E_1(1-b)}{k-g} = \frac{4.20(1-0.40)}{0.14-0.05}$$

$$= \frac{4.20(0.60)}{0.09}$$

$$= \frac{2.52}{0.09} = Rs. 28$$

∴   The current value of a share is Rs. 28.

Working Notes

E_1 = $E_0 (1+g)$ = 4 (1+0.05)

= Rs. 4.20.

9. **The Almas corporation's cash dividend payout ratio is 60%, its risk adjusted cost of capital is 10%, the current earnings per share are Rs. 4.04 and have been growing at 3% per year. A technological break through is expected to increase Almas growth rate to 60% for the foreseeable future. Almas corporations common stock has been selling at 8 to 9 times its earnings. What do you expect the price-earnings ratio will be after technological development is publicly announced ?**

Sol :

Using the fact that,

D_1 = $D_0 (1+g) = E_0 (1-b)(1+g)$

$\therefore$ $D_6 = 4.04 (0.60) (1+0.03) = $ Rs. 2.50

But, $\dfrac{P_0}{E_0} = \dfrac{\dfrac{D_1}{E_0}}{k-g} = \dfrac{\dfrac{2.50}{4.04}}{0.10-0.03}$

$= \dfrac{0.62}{0.07} = 8.86$ times

$\therefore$ Almas corporation's stock was selling at about 8.9 times its earnings per share before the new technology.

Technological break through will increase growth rate to 6% and hence,

$D_1 = 4.04 (0.60) (1+0.06) = 2.569$

And then,

$\dfrac{P_0}{E_0} = \dfrac{\dfrac{2.569}{4.04}}{0.10-0.06} = \dfrac{0.636}{0.04} = 15.9$ times

$\therefore$ After the new technology elevates Almas corporations growth rate to 6%, the common stock will be worth 15.9 times its earnings per share.

10. **The returns of Moon company at present is 21%. This is assumed to continue for the next five years and after that it is assumed to have a growth rate of 10% indefinitely. The dividend paid for the current year is 3.2 Rs. The required rate of return is 20% and the present price is Rs. 57. What is the estimated price according to the two stage model ?**

Sol :

According to two - stage model

$$P_0 = \left[\sum_{t=1}^{n} \frac{D_0 + (1+g_s)^t}{(1+k)^t} \right] + \left[\frac{D_{n+1}}{(k-g_n)} \times \frac{1}{(1+k)^n} \right]$$

Here, D_0 = Rs. 3.20,

g_s = 21%

g_n = 0.10

k = 20%

n = 5 years

By substituting the above values in a given formula, we get,

$\therefore$ $P_0 = \left[\dfrac{3.20(1+0.21)}{(1+0.20)^1} + \dfrac{3.20(1+0.21)^2}{(1+0.20)^2} + \dfrac{3.20(1+0.21)^3}{(1+0.20)^3} + \right.$

$$\left. \frac{3.20(1+0.21)^4}{(1+0.20)^4} + \frac{3.20(1+0.21)^5}{(1+0.20)^5} \right] + \left[\frac{8.30(1+0.10)}{(0.20-0.10)(1+0.20)^5} \right]$$

$$= \frac{3.872}{1.20} + \frac{4.6851}{1.44} + \frac{5.669}{1.728} + \frac{6.8595}{2.0736} + \frac{8.30}{2.4883} + \frac{9.13}{0.24883}$$

$$= 3.2267 + 3.2535 + 3.2807 + 3.3080 + 3.3356 + 36.69$$

$$\therefore \ P_0 = Rs. \ 53.09.$$

11. A company has paid a dividend of Rs. 2 per share during the last year. The estimated growth of dividends is expected to be 5% p.a. Determine the estimated marked price of equity share if the estimated growth rate of dividends: (a) raises to 8% and (b) falls by 3%. Also find out the present market price of the share, given the required rate of return of the equity investors is 155%.

Sol :   **(April-21, Imp.)**

Determination of present market price of the equity share if the growth rate is expected to be 5%.

$$P_0 = \frac{D_1}{K-g}$$

Where,

$$D_1 = 2.(1+0.05) = Rs. \ 2.10, \ K = 15.5\% \ (or) \ 0.155, \ g = 5\% \ (or) \ 0.05$$

$$P_0 = \frac{2.10}{0.155-0.05} = \frac{2.10}{0.105} = Rs. \ 20$$

(a) Determination of estimated marked price of the equity share if the growth rate of dividend rises to 8%

$$P_0 = \frac{D_1}{K-g}$$

Where,

$$D_1 = 2(1+0.08) = Rs. \ 2.16, \ K = 15.5\% \ (or) \ 0.155, \ g = 8\% \ (or) \ 0.08$$

$$P_0 = \frac{2.16}{0.155-0.08} = \frac{2.16}{0.075} = Rs. \ 28.80$$

(b) Determination of estimated market price of equity share if the growth rate of dividend falls to 3%.

$$P_0 = \frac{D_1}{K-g}$$

Where,

$$D_1 = 2(1+0.03) = Rs. \ 2.06, \ K = 15.5\% \ (or) \ 0.155, \ g = 3\% \ (or) \ 0.03$$

$$P_0 = \frac{2.06}{0.155-0.03} = \frac{2.06}{0.125} = Rs. \ 16.48.$$

12. **The current price of a company share is Rs.70. The company is expected to pay a dividend of Rs.4.20 per share increasing with an annual growth rate of 5%. If an investor's required rate of return is 10%, should he buy the share?**

Sol :   (May-23, Imp.)

Intrinsic value = D1 / (r – g)

where,

D1 is the expected dividend for the next year

r is the required rate of return

g is the annual growth rate of dividends

D1   = $D_0(1+g)$

      = Rs. 4.20*(1 + 0.05)

      = Rs. 4.41

where,

D1   = Rs. 4.41

r   = 0.10 (10% as a decimal)

g   = 0.05 (5% as a decimal)

Intrinsic Value = Rs. 4.41 / (0.10 – 0.05)

        = Rs. 4.41 / 0.05

        = Rs. 88.20

The intrinsic value of the share is Rs. 88.20.

13. **A company paid dividends amounting to 0.75 per share during the last year. The company is expected to pay ₹ 2 per share during the next year. Investors forecast a dividend of ₹ 3 per share in the year after that. Therefore it is expected that dividends will grow at 10 percent per year into an indefinite future. Would you buy/sell the share if the current prices of the share is ₹ 54 ? Investors required rate of return is 15 percent.**

Sol :   (May-19)

Given that,

    g   = 10%

    D_1 = ₹ 2

    D_2 = ₹ 3

    K   = 15%

    n   = 2 years

The formula for calculating two stage growth model is $P_0 = V_1 + V_2$ where,

$$V_1 = \sum_{t=1}^{n} \frac{D_1}{(1+k)^1} \quad V_2 = \frac{D_n(1+g)}{(k-g)(1+k)^n}$$

$$V_1 = \frac{D_1}{(1+k)^1} + \frac{D_2}{(1+k)^2} + \cdots \frac{D_n}{(1+k)^n}$$

$$V_1 = \frac{2}{(1+0.15)^1} + \frac{3}{(1+0.15)^2}$$

$$= 1.74 + 2.27 = 4.01$$

$$V_2 = \frac{3(1+0.10)}{(0.15-0.10)(1+0.15)^2} \quad V_2 = \frac{3.3}{(0.05)(1.3225)}$$

$$= 49.91$$

$$P_0 = 4.01 + 49.91$$

$$\therefore \quad P_0 = 53.92$$

The current price of the share is ₹ 54 which is equal to the intrinsic value of ₹ 53.9 Thus, no trading is recommended because the share is priced fairly.

4.3.2 Price to Book Value

Q9. Define Price to Book Value Ratio. State the determinants of P/BV Ratio.

Ans :

The book value per share is the net worth of the company (total assets minus total liabilities) divided by the number of equity shares issued. The book value is determined by economic events as well as accounting conventions. The market price of the share, in contrast, is mainly determined by how the market assesses its earning power. The ratio of market price to book value is :

$$\text{P/BV ratio} = \text{Price/book value ratio} = \frac{\text{Market price per share at time } t}{\text{Book value per share at time } t}$$

The P/BV ratio has always drawn the attention of investors. During the 1990s Eugene Fama and others suggested that the PBV ratio explained to a significant extent the returns from stocks. The findings of other researches like Kim and others, however, have cast some shadow over the role of the PBV ratio.

Determinants of the Price to Book Value Ratio

To understand the determinants of the P/BV ratio, let us start with the constant growth dividend discount model :

Where,

d_1 = Dividend for next period

G = Growth rate

R = Rate of return

e_0 – Earnings per share

(1 – a) = Dividend payout ratio

$d_1 = e_1(1 - a)$

$\quad = e_1 (1 + G)(1 - a)$

Substituting the value of dl in constant growth dividend discount model,

$$P_0 = \frac{e_0(1+G)(1-a)}{R-G}$$

As e_0 is the outcome of book value per share (bv_0) and Return On Equity (ROE), the above equation can be written as,

$$P_0 = \frac{bv_0(ROE)(1+G)(1-a)}{R-G}$$

Dividing both the sides of above equation by book value per share. It results in,

$$P/B\ V\ ratio = \frac{P_0}{bv_0} = \frac{(ROE)(1+G)(1-a)}{R-G}$$

In the above equation, numerator indicates that if other things being equal a higher ROE leads to increase in P/BV ratio. While the denominator indicates that higher ROE results in increase of P/B V ratio indirectly as G = (Retention Ratio)(ROE) = (a) (ROE).

4.3.3 Price to Sales Ratio

Q10. Explain how price to sales ratio is calculated. What are the determinants of PS Ratios.

Ans :

The price / sales ratio (PS ratio) has gained much importance as a valuation technique. The PS ratio is computed by dividing the company's current stock price by its revenue per share for the last twelve months. On the other hand, it can also be computed by dividing the present market value of equity capital by the yearly sales value of the firm. Basically, the PS ratio explains and indicates the market's willingness as to pay in exchange of one rupee of sales.

The following are some of the problems which the investors may face while using the PE ratio,

1. Highly inconsistent earnings.

2. Negative earnings.

3. Earnings may be explained in various ways.

4. Possibility of Managed earnings.

In order to remove or reduce such type of problems, PS ratio must be used continuously. James O'shaugnessy after evaluating various tools and techniques of investment like book value, return on equity, PE ratio, yield, PS ratio etc., have suggested and recommended that out of all the investment tools PS ratio has been considered as the most useful tool. This is because the portfolios of low PS ratio stocks are more effective than the portfolios of high PS ratio stocks.

According to a famous thumb rule a standard PS ratio of 1.0 can be used by all companies. The stocks which are traded at PS ratio and which are less than 1.0 Example 0.5 are considered as 'bargains'. PS ratio is not same for all industries. It basically differs from one industry to another industries firms because the factors like net profit margin, growth rate, asset turnover, etc. are not same for all, they vary from one firms to another firm.

The PS ratio is a technique of relative valuation and is being interpreted in terms of drivers. One of the key drivers of PS ratio is the net profit margin which implies that PS ratio is considered as PS ratio/Net profit margin. PS ratio being one of the technique of relative valuation must be compared with the industry average and its own history.

Determinants of the PS Ratio

The determinants of the PS ratio can be understood clearly with the help of the following equation,

$$\boxed{P_0 = \frac{e_0(1+G)(1-a)}{R-G}}$$

Since, the earnings per share (e_0) is equal to sales per share (s_Q) times net profit margin (NPM). Then it can written as,

$$\boxed{P_0 = \frac{s_0(NPM)(1+G)(1-a)}{R-G}}$$

Both the sides of equation are divided by further resulting into,

$$\boxed{PS\ ratio = \frac{p_0}{s_0} = \frac{(NPM)(1+G)(1-a)}{R-G}}$$

Where,

G = Growth rate

R = Rate of return

(1 - a) = Dividend payout ratio

NPM = Net profit margin

s_0 = Sales per share.

131

4.4 ECONOMIC VALUE ADDED APPROACH

Q11. Discuss briefly about Economic Value Added Approach.

(OR)

Discuss in detail the concept of Economic value added approach.

Ans :   **(Oct.-20, Imp.)**

Economic Value Added (EVA) approach was developed by Stern Stewart and company. In present scenario, it is very popular and many persons refer it with different names like Peter Drucker referred it as measure of total factor productivity and feature magazine referred it as "today's hottest financial idea and getting hotter".

EVA is basically the excess amount left on after making a proper charge for the capital invested in the business. EVA can be evaluated in different ways. They are,

$$EVA = NOPAT - C^* \times CAPITAL$$

$$EVA = CAPITAL\ (r - C^*)$$

$$EVA = [PAT + INT\ (1 - 1)] - C^*\ CAPITAL$$

$$EVA = PAT - K_e\ EQUITY$$

Where,

EVA = Economic Value Added

NOPAT = Net Operating Profit After Tax

C^* = Cost of Capital

CAPITAL = Economic book value of the capital j invested in the firm.

r = Return on capital'
= NOPAT/CAPITAL

PAT = Profit After Tax

INT = Interest expense of the firm

t = Marginal tax rate of the firm

K = Cost of equity

EQUITY = Equity utilized in the firm.

Features

➤ It acts as performance measure which is linked to shareholder value creation in all directions.

➤ It is useful in providing business knowledge to everyone.

➤ It is an efficient method for communicating to investors.

➤ It transforms the accounting information into economic quality which can be easily understood nonfmancial managers.

➤ It is useful in evaluating net present value of project in capital budgeting which is contradictory to IRR.

➤ Instead of writing the value of firm in terms of discounted cash flow, it can be expressed in EVA of projects.

4.5 FUNDAMENTAL ANALYSIS

Q12. Explain the concept of Fundamental Analysis ?

(OR)

Explain in detail about Fundamental Analysis

(OR)

Define Fundamental Analysis. State the objectives of fundamental analysis.

Ans :   **(Oct.20, Imp.)**

Introduction

Investment decisions are a part of our economic life. Everybody makes such decisions in different contexts at different times. Some are able to reap more profits through them; while other simply lose their money. Attempts should, therefore, be made to understand and know the way sound investments decision can be made in order to improve the change of making profit through them. Thus, investment decision-making is an important area probing further.

In the fundamental approach an attempt is made to analyze various fundamental or basic factors that affect the risk-return of the securities. The effort here is to identify those securities that on perceives as mispriced in the stock market. The assumption in this case is that the 'market price' of security and the price is justified by its fundamental factors called 'intrinsic value' are different and their market place provides an opportunity for a discerning investor to detect such discrepancy. The moment such a description is identified, a decision to invest or disinvest is made.

The price prevailing in market is called "market price" (MP) and the one justified by its fundamentals is called "intrinsic value" (IV).

Objectives

The objectives of fundamental analysis are as follows,

1. To make effective financial forecast for investments.

2. To calculate the risk involved in investment

3. To conduct stock evaluation of a company

4. To forecast price fluctuation of a security.

5. To evaluate the business performance and its decisions.

6. To evaluate credit risk of company.

Criteria for selecting an Investment :

1) If IV > MP, buy the security

2) If IV < MP, sell the security

3) If IV = Mp, no action.

The fundamental factors mentioned above may relate to the economy or industry or company or all some of this. Thus Fundamental Approach includes three analysis :

1) Economic Analysis

2) Industry Analysis

3) Company Analysis
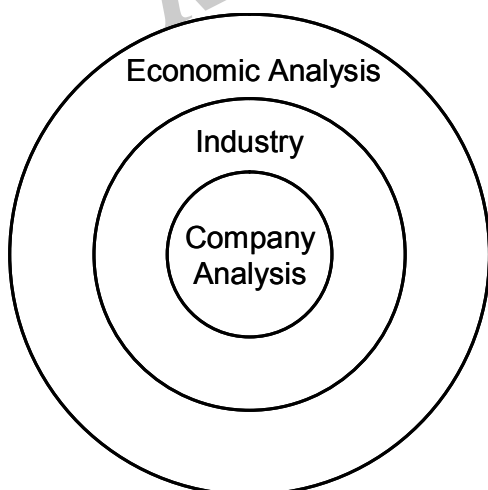
Figure : Fundamental Analysis

Q13. What is Economic Analysis ? Explain the Significance of Economic Analysis.

Ans :

Economic Analysis

Economic analysis is a study of the general economic factors that go into an evaluation of a security's value. The stock market is an integral part of the economy. When the level of economic activity is low, stock prices are low, and when the level of economic activity is high, stock prices are high, reflecting a booming outlook for the sales and profits of firms. An analysis of the macroeconomic environment is essential to understand the behaviour of stock prices.

1. Gross Domestic Product

The GDP represents the aggregate monetary value of the goods and services produced in the economy during a specified period. Although GDP is usually calculated on an annual basis, quarterly estimates are also available. The common equation for the calculation of GDP is:

GDP = Consumption + Investment + Exports – Imports

The growth rate of GDP points out the prospects for the industrial sector and the return investors can expect from an investment in shares. A decline in the GDP indicates a potential economic slowdown. A high GDP growth rate is advantageous to the stock market.

Significance

(i) Growth Rate of Gross Domestic Product

The gross domestic product is a measure of the total production of final goods and services in the economy during a specified period usually a year. The growth rate of GDP is the most important indicator of the performance of the economy. The higher the growth rate of GDP, other things being equal, the more favourable it is for the stock market.

(ii) Industrial Growth Rate

The GDP growth rate represents the average of the growth rates of the three principal sectors of the economy, viz. the services sector, the industry sector, and the agricultural sector.

Publicly listed companies play a major role in the industrial sector but only a minor role in the

service sector and the agricultural sector. Hence stock market analyst focus more on the industrial sector. They look at the overall industrial growth rate as well as the growth rates of different industries.

The higher the growth rate of the industrial sector, other things being equal, the more favourable it is for the stock market.

(iii) Monsoons

Agriculture accounts for about a quarter of the Indian economy and has important linkages, direct and indirect, with industry. Hence, the increase or decrease of agricultural production has a significant bearing in industrial production and corporate performance. Companies using agricultural raw materials as inputs or supplying inputs to agriculture are directly affected by the changes in agricultural production. Other companies also tend to be affected due to indirect linkages.

(iv) Fiscal Deficit

Government play an important role in most economies, including the Indian economy. The central budget as well as the state budgets prepared annually provides information on revenues, expenditures and deficit or surplus.

Investment analyst examines the government budget to assess how it is likely to impact on the stock market.

(v) Interest Rate

A rise in interest rates depresses corporate profitability and also leads to an increase in the discount rate applied by equity investors, both of which have an adverse impact on stock prices. On the other hand, a fall in interest rates improves corporate profitability and also leads to a decline in the discount rate applied by equity investors, both of which have a favourable impact on stock prices.

(vi) Inflation

The effect of inflation on the corporate sector tends to be uneven. While certain industries benefit, others tend to suffer. Industries that enjoy a strong market for their products and which do not come under the purview of price control may

benefit. On the other hand, industries have a weak and which come under the purview of price control tend to lose.

(vii) Balance of Payments, Forex Reserves, and Exchange Rates

Balance of Payment Deficit = Balance of Trade Deficit (Imports minus exports) + Balance on 'invisible' like tourism and interest rates (payment on account of invisibles minus receipts on account of invisibles) + Balance on account of capital account (Repayment on account of loans minus receipt of loans)

Q14. Describe the key economic variables that an investor must monitor as part of his fundamental analysis.

Ans :   **(May-19, Imp.)**

Factors Analysis And Portfolio Management

The commonly analyzed macro economic factors are as follows,

(i) Gross Domestic Product (GDP)

GDP indicates the rate of growth of the economy. It represents aggregate value of the goods and services produced in the economy. The GDP growth of economy points out the prospects for the industrial sector and return investors can expect from investment in shares. The higher growth rate is more favourable to the stock market.

(ii) Savings and Investment

Stock market is a channel through which the savings of the investors are made available to the corporate bodies. Savings are distributed over various assets like equity shares, deposits, mutual funds units, real estate and bullion. The savings and investment patterns of the public, affect the stock to a great extent.

(iii) Inflation

With the increase in inflation rate, the real rate of growth would be very little. The demand in the consumer product industry is significantly affected. If there is a mild level of inflation, it is good to the stock market but high rate of inflation is harmful to the stock market.

(iv) Interest Rates

The interest rate affects the cost of financing to the firms. A decrease in interest rate implies lower cost of finance for firms and more profitability. Availability of cheap fund, encourages speculation and rise in the price of shares.

(v) Budget

The budget draft provides an elaborate account of the government revenues and expenditure. A deficit budget may lead to high rate of inflation and adversely affect the cost of production. Surplus budget may result in deflation. Hence, balanced budget is highly favourable to the stock market.

(vi) Tax Structure

Every year in March, the business community eagerly awaits the governments announcement regarding the tax policy. Tax reliefs given to savings encourage savings. The type of tax exemption has impact on the profitability of the industries.

(vii) Balance of Payment

The balance of payment is the record of a country's money receipts from and payments abroad. The difference between receipts and payments may be surplus or deficit. Balance of payment is a measure of the strength of rupee on external account. A favourable balance of payment renders a positive effect on the stock market.

Q15. Define Industry Analysis. Explain the classification of industries.

Ans :

Meaning

After conducting an analysis of the economy, the analyst must - look into various sectors of the economy in terms of various industries. An industry is a homogeneous group of companies. That is, companies with similar characteristic can be divided into one industrial group. There are man bases on which grouping of companies can be done.

Classification

(i) Growth industry

Growth industries have special features of high rate of earnings and growth in expansion, independent of the business cycle. The expansion of the industry depends mainly on technological change.

(ii) Cyclical industry

The growth and profitability of an industry move in tandem with the business cycle. During a boom, industries enjoy growth and during a depression they suffer a setback.

(iii) Defensive industry

A defensive industry defies the movement of the business cycle. For example, food and shelter satisfy basic human needs. The food industry withstands recessions and depressions. The stocks of defensive industries can be held by the investor for income earning purposes. They expand and earn income in a depression too, under the government's umbrella of protection, and are counter-cyclical in nature.

(iv) Cyclical growth industry

This is a new type of industry that is cyclical and at the same time growing. For example, the automobile industry experiences periods of stagnation and decline but also grows tremendously. Changes in technology and introduction of new models can help the automobile industry to resume its growth path.

Q16. Explain the Key Indicators of Industrial Analysis.

Ans :

The analyst is free to choose his or her own indicators for analyzing the prospectus of an industry. However, many commonly adopt the following factors.

(i) Performance Factors : Performance factors like

➤ Past Sales

➤ Past Earnings

(ii) Environment Factors : Environment factors like

➤ Attitude of government

➤ Labour conditions

➤ Competitive conditions

➤ Technological progress

(iii) Outcome factors : Outcome factors lime

➤ Industry share prices

➤ Strengths and weaknesses

➤ Opportunities and threats.

Q17. Describe the various stages of industry life cycle.

Ans :

A. Industry Life-Cycle Stages

Ever industry passes through different stages in its lifetime. The stages can be identified as follows:

(i) Pioneering Stage

This stage is characterized by introduction of a new product, and an up trend in business cycle that encourages new product introductions. Demand keeps on growing at an increasing rate. Competition is generated by the entry of new firms to grab the market opportunities. Weaker firms face premature death while stronger one survives to grow and expand.

(ii) Expansion Stage

This is characterized by the hectic activity of firms surviving the pioneering stage. The market continues to grow but slowly, offering steady and slow growth in sales of the industry. It is a phase of consolidation wherein companies establish durable policies relating to dividends and investments.

(iii) Stabilization Stage

This stage shows signs of slow progress and also prospects of decay.

(iv) Decay Stage

An industry reaches this stage when it fails to detect the death signal and implement-pro-actively or reactively-appropriate strategies. Obsolescence manifests itself, effecting a decline in sales, profit, dividends and share prices.

B. Business Cycle

The other way to analyze industries is by their operating ability in relation to the economy as a whole and that is classifying industries on the basis of the business cycle. There are three stages of business cycle. They are,

(i) Growth Industry

In growth industries, earnings are expected to be above the average of all industries and such growth occur regardless of setbacks of the economy.

(ii) Cyclical Industry

The industries are mostly volatile and companies do well when the economy prospers and during depression they suffer a setback.

(iii) Defensive Industry

They are least affected by recessions and economic adversity. The stocks of the defensive industries can be held by the investor for income earning purpose.

Finally, the structural analysis helps to understand the nature of competition existing in the industry as increasing competition drives down the rate of return on invested capital.

Therefore, an analyst must evaluate all the factors before making an investment. If the above factors indicate that the industry has favourable future prospects, funds may be committed to that industry.

Q18. Explain the importance of company analysis.

Ans :

Meaning

Company analysis deals with the estimates return and risk of individual shares. This calls for information regarding companies which can be broadly classified into two broad groups, internal and external. Internal information consists of data and events made public by companies concerning their operations.

In company analysis, the analyst tries to forecast the future earnings of the company because there is strong evidence that earnings have a direct and powerful effect upon share prices. The level, trend and stability of earnings of a company, however, depend upon a number of factors concerning the operation of company.

A. Financial Statements

The prosperity of a company would depend upon its profitability and financial health. The financial statements published by the company periodically help us to assess the profitability and financial health of the company. The two basic statements provided by the company are as follows,

(i) Balance Sheet

It helps to assess the financial position of the company at a particular point of time.

It shows the list of assets and liabilities of a company on a specific data.

(ii) Profit and Loss Account

It determines the performance of the company during a particular period. It reveals the revenue earned, the cost incurred and the resulting profit or loss of the company.

B. Analysis of Financial Statements

The analysis of financial statements reveals the nature of relationship between income and expenditure, the sources and application of funds. This can be done by using the following,

(i) Comparative Financial Statements

In the comparative statement, balance sheet figures are provided for more than one year. The comparative financial statement provides time perspective to the balance sheet figures. The annual data are compared with similar data of previous years, either in absolute terms of in percentages.

(ii) Trend Analysis

Here percentages are calculated with a base year. This would provide insight into growth or decline of the sale or profit over the years. Here in, the investor has to look into the cost and management efficiency of the company by examining the trends prevailing.

(iii) Common Size Statement

Common size balance sheet shows the percentage of each asset item to the total assets and each liability item to the total liabilities. Similarly, a common size income statement shows each item of expense as a percentage of net sales. With common size statements comparison can be made between two different size firms belonging to the same industry.

(iv) Funds Flow Analysis

This statement provides an insight into the movement of funds and helps in understanding the changes in the structure of assets, liabilities and owners equity. It reveals how funds have been raised and used during an accounting period.

(v) Cash Flow Analysis

It categorically provides an insight into the inflow and outflow of cash during an accounting period. It shows changes in cash balance between the two balance sheet dates.

(vi) Ratio Analysis

It helps an investor to determine the strengths and weakness of a company by establishing the relationship between various elements of financial statements. Different ratios measures different aspects of a company's health. Four groups of ratios are as follows,

(vii) Liquidity Ratios

These measures the company's ability to fulfill its short-term obligations and reflects its short-term financial strength. The commonly used liquidity ratios are current ratio, quick ratio and super-quick ratio.

(viii) Leverage Ratios

These ratios are also known as capital structure ratios. They measure the company's ability to meets its long-term debt obligations. They throw light on long-term solvency of a company. The commonly used leverage ratios are debt-equity ratio, debt to total assets ratio, proprietary ratio, interest coverage ratio.

(ix) Profitability Ratios

The profitability of a company can be measured by the profitability ratios. These ratios are calculated by relating the profits either to sales, or to investment, or to the equity shares. Thus we have three groups of profitability ratios. The overall profitability is measured by the return on investment, which is a central measure of the earning power or operating efficiency of a company.

(x) Activity Ratios

These are also known as turnover ratios. These ratios measure the efficiency in asset management. They express the relationship between sales and the different types of assets, showing the speed with which these assets generate sales.

C.   Assessment of Risk

Company analysis involves not only an estimation of future returns but also an assessment of the variability in returns called risk. The variability in returns arises primarily because of variability in sales. The sensitivity of profits of changes in the level of sales is measured by a ratio called Degree of Total Leverage (DTL). This ratio is used as a measure of risk. It is calculated as follows,

$$DTL = \frac{Contribution}{Profit\ Before\ Tax\ (PBT)}$$

It may be noted that contribution means sales minus the variable cost. DTL may be subdivided into two components,

(i)   The Degree of Operating leverage (DOL) arising from the cost structure of the company and

(ii) The Degree of Financial Leverage (DFL) arising from the capital structure of the company.

DOL measures the percentage change in EBIT for a 1% change in sales and is computed as,

$$DFL = \frac{EBIT}{PBT}$$

The Degree of Total Leverage (DTL) is the product of DOL and DFL and measures the percentage change in PBT for a 1% change in sales.

D.   Non-financial Parameters

The important non-financial parameters to be examined by an investor are as follows,

(i)   Top Management

The quality of top management team, particularly, the competence and the commitment of the chief executive officer matters a lot in shaping the destiny of the company.

(ii) Product Range

Progressive companies like ITC and Hindustan Lever creates competition for their existing products by launching new product with regular frequency. Hence, investors must examine whether the company under review belongs to this group or not.

(iii) Foreign Collaboration

When a company has entered into technical collaboration with a foreign company, the investor must find out more about the nature of the collaboration agreement.

(iv) Research and Development Progressive companies spend substantial sum of money on R and D to upgrade their existing products, introduce new products, adapt foreign technology to suit the local conditions, achieve import substitution etc.

(v)   Governmental Regulations

The investor must assess the implication of governmental regulation such as MRTP act, FERA etc, for the company under review. The investment decision is ultimately a decision to invest in the shares of one or more specific companies. Company analysis deals with an analysis of various factors affecting the performance of companies so as to forecast the future earning of a company is also its variability better known as risk.

4.6 TECHNICAL ANALYSIS

Q19.   What is technical analysis ? Explain the assumptions of technical analysis.

(OR)

Explain in detail about Technical Analysis

Ans :   (Oct.-20, Imp.)

Meaning

Technical analysis is a method of evaluating securities analyzing the statistics generated market activity, such as past prices and volume. Technical analysts do not attempt to measure a security's intrinsic value, but instead use charts and other tools to identify patterns that can suggest future activity.

Unlike fundamental analysts, technical analysts don't care whether a stock is undervalued- the only thing that matters is a security's past trading data and what information this data can provide about where the security might move in the future.

Assumptions

The basic technical assumptions are:

(i) The market Discounts Everything

A major criticism of technical analysis so that it only considers price movement, ignoring the fundamental factors of the company. However, technical analysis assumes that, at an given time, a stock's price reflects everything that has or could affect the company-including fundamental factors.

(ii) Price Moves in Trends

In technical analysis, price movements are believed to follow trends. This means that after a trend has been established, the future price movement is more likely to be in the same direction as the trend than to be against it. Most technical strategies are based on this assumption.

(iii) History Tends to Repeat Itself

Another important postulate in technical analysis is that history tends to repeat itself, mainly in terms of price movement. The repetitive nature of price movements is attributed to market psychology; in other words, market participants tend to provide a consistent reaction to similar market stimuli over time. Technical analysis uses chart patterns to analyze market movements and understand trends.

Q20 What are the advantages and limitations of technical analysis?

Ans :   *(Aug.-21, Imp.)*

Advantages

➢ Technical analysis helps traders and investors alike to review their investment decisions faster. This is because prices tend to discount, i.e. anticipate, fundamental information much before an actual event takes place.

➢ All results and indicators can be tested and verified historically.

➢ The advent of low-priced personal computer systems had made the use of technical analysis even less difficult to test and employ.

➢ Technical analysis is considered to be a disciplined approach as it makes use of stop loss theory.

Disadvantages

➢ Technical Analysis is not a valid scientific approach because most methods study prices based upon price related data. Therefore it is necessary that a trader continuously review his trading systems to check its work ability.

➢ The basis of technical analysis may be easy to learn but rather difficult to implement and master.

➢ Most traders tend to oscillate between different approaches and thus fail to follow through with their analysis in a consistent manner, and this ultimately results into losses more often than profit.

Q21. Explain the tools of Technical Analysis.

Ans :

The tools of technical analysis are :

1. Dow Theory

The Dow Theory is one of the oldest and most famous technical tools. It was originated by Charles Dow, who founded the Dow Jones company and was the editor of The Wall Street,

According to Dow

"The market is always considered as having three movements, all going at the same time. The first is the narrow movement from day-to-day. The second is the short swing running from two weeks to a month or more, the third is the main movement covering at least four years in duration".

These movements are called :

(a) Daily Fluctuations (Minor Trends)

The minor trends have little analytical value, because of their short duration and variations in amplitude.

(b) Secondary Movements (trends)

The secondary trend acts as a restraining force on the primary trend. It ends to correct deviations from its general boundaries.

(c) Primary Trends

The primary trends are the long range cycle that carries the entire market up or down (bull or bear markets).

Types of Averages

The Dow Theory is build upon the assertion that measured of stock prices tend to move together. It employs two of the Dow Jones Averages.

(a) Dow-jones Industrial Average

(b) Dow-jones Transportation Average

Types of Market

There are three types of market

(a) Bull Market

If both the averages are rising.

(b) Bear Market

If both the averages are falling

(c) Uncertain

If one rising and other is falling

Criticism of Dow Theory

Several criticisms are leveled against the Dow Theory :

(a) It is not a theory but an interpretation of known data. A theory should be able to explain why a phenomenon occurs. No attempt was made by Dow or his followers to explain why the two averages should be able to forecast future stock prices.

(b) It has poor predictive power.

2. Trend Analysis

There are three types of tend.

(a) Upward Trend

As the name imply, when each successive peak and trough is higher, it's referred to as an upward trend.

(b) Downward Trend

If the peaks and troughs are getting lower, its a downtrend.

(c) Horizontal Trend

When there little movement up or down in the peaks and troughs, it's aside ways or horizontal trend.

3. Charts Types

Technical analysis use three basic types of charts:

(a) Line Charts

The most basic chart is the line chart because it represents only the closing prices ewer a set period of time. The line of formed by connecting the closing prices over the time frame. Line charts do not provide visual information of the trading range for the individual points such as the high, low and opening prices. However, the closing price is often considered to be the most important price in stock data compared to the high and low for the day and this is why t is the only value used in line charts.

(b) Bar Charts

Most investors interested in charting use bar charts-primarily because they have meanings familiar to a technical analysts, but also because these charts are easy to draw. The procedure for preparing a vertical line or bar chart is simple. The vertical dimensions of the line represent price, the horizontal dimension indicates the time involved by the chart as a whole.

4. Chart Pattern

A chart pattern is a distinct formation on a stock chart that creates a trading signal, or a sign of future price movements. Chartists use these patterns to identify current trends and trend reversals and to trigger buy and sell signals.

5. Moving Averages

Most chart patterns show a lot of variation in price movement. This can make it difficult for traders to get an idea of a security's overall trend. One simple method traders use to combat this is to apply moving averages.

Amoving average is the average price of a security over a set amount of time. It simple takes the sum of all of the past closing prices over the time period and divides the results by the number of prices used in the calculation. For instance, in a 10-day moving average, the last 10 closing prices are added together and then divided by 10. Criticism of Technical Analysis : The various limitations of technical analysis were pointed out by its critics are as given under:

(i) Difficult in interpretation

Technical analysis is not as simple as it appears to be. While the charts are fascinating to look at, interpreting them correctly is very difficult.

(ii) Frequent Changes

With changes in market, chart patterns keep on changing. Accordingly, technical analysts change their opinions about a particular investment frequently. One day they put

signal. A couple of weeks later, they see a change pattern and put up a sell signal.

(iii) Unreliable Changes

Changes in market behaviour observed and studied by technical analysts may not always be reliable owing to ignorance or intelligence or manipulative tendencies of some participants.

(iv) History does not repeat itself

One of the major limitations of technical analysis is that the entire data is based on the past. It is presumed that future resembles the past. There is no guarantee that history repeats itself.

(v) False signals can occur

Technical analysis is a signaling device. Like a thermometer, it may give a false indication when there is no alarm.

Q22. Explain various charts in technical analysis.

Ans :

The most commonly used charts are :

1.   Line Charts/Line and Volume Charts

2.   Bar Charts

3.   Point-and-Figure Charts

4.   Candle Stick Charts

A brief comparison of these four types of charts is given below.

1.   Line chart

The line chart connects the prices over a time period and is more useful for identifying long-term trends. It has a line that connects the closing price against time.
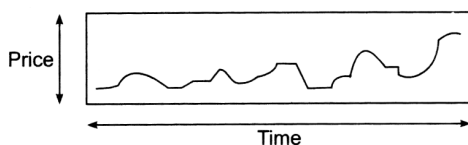
2.   Bar chart

The bar chart gives the chartist information on price changes at a time. In this, the high, low, open, close share price or index level is plotted against time.
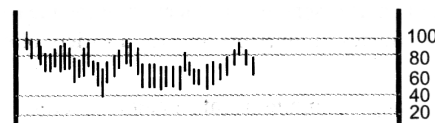
3.   Point-and-figure chart

The point-and-figure chart shows only the price changes. It eliminates noise of detail, focusing only on trends. The two distinct marks of cross/round indicate respectively a rise/fall in a price range.
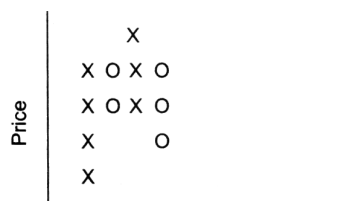
4.   Candlestick chart

Candlesticks plot information similar to bar charts but could reveal an extra intuitive interpretation. Candlesticks are shown as a vertical rectangle with wicks at both ends. When the closing price is higher than the opening, the rectangle is transparent, and in the reverse case, it is black.

Q23. Discuss briefly about evaluation of technical analysis.

Ans :

Technical analysis appears to be a highly controversial approach to security analysis. It has its ardent votaries; it has its severe critics. The advocates of technical analysis offer the following interrelated arguments in support of their position.

1.   Under the influence of crowd psychology, trends persist for quite some time. Tools of technical analysis that help in identifying these trends early are helpful aids in investment decision making.

2.   Shifts in demand and supply are gradual rather than instantaneous. Technical analysis helps in detecting these shifts rather early and hence provides clues to future price movements.

3.   Fundamental information about a company is absorbed and assimilated by the market over a period of time. Hence, the price movement tends to continue in more or less the same direction till the information is fully assimilated in the stock price.

4.   Charts provide a picture of what has happened in the past and hence give a sense of volatility that can be expected from the stock. Further, the information on trading volume which is ordinarily provided at the bottom of a bar chart gives a fair idea of the extent of public interest in the stock.

Q24. How moving averages are useful is studying trends and trend reversals?

Ans :   **(May-22, Imp.)**

Once a moving average is calculated and plotted on a chart, it can be a powerful visual trend-spotting tool. If a moving average is rising, it can signal that a stock is in an uptrend. Conversely, when a moving average is falling, it can signal that a stock is in a downtrend.

Many traders use moving averages to identify a current trend and as an entry and exit strategy. One of the simplest strategies relies on the crossing of two or more moving averages. The basic signal is given when the short-term average crosses above or below the longer-term moving average. Two or more moving averages allow you to see a longer-term trend compared to a shorter-term moving average; it is also an easy method for determining whether the trend is gaining strength or if it is about to reverse.

The chart above uses two moving averages, one long-term (50-day, shown by the orange line) and the other shorter-term (15-day, shown by the yellow line). This is the same Google chart shown in the first chart, but with the two moving averages to illustrate the difference between the two lengths.

Q25. Differentiate between Fundamental Analysis and technical analysis.

Ans :   **(Dec.-19, Imp.)**

S.No.	Basis of Difference	Fundamental Analysis	Technical Analysis
1	Nature	The perspective is long-term in nature.	It outlook is short-term oriented.
2.	Difference between current income and capital gains	It considered total gain from equity investment consists of current yield by way of dividends and long-term gains by way of capital appreciation.	It does not distinguish between current income and capital gains.

3.	Base of Analysis	It forecasts stock prices on the basis of economic, industry and company statistics. The principal decision variables take the form of earnings and dividends.	It forecasts security prices by studying patterns of supply of and demand for securities. Technical analysis study of stock exchange information.
4.	Tools	It uses tools of financial analysis and statistical forecasting techniques	It uses mainly changes of financial variables besides some quantitative tools.

Q26. Explain about chart pattern and Relative Strength Index

Ans :   **(May-19, Imp.)**

Chart patterns can be viewed when the price bar charts are closely drawn for number of days. Technical analysts use chart patterns in order to determine the changes in trends and estimate the future movement of prices. The following are the different types of chart patterns.

(i)   Reversal Patterns

(ii)   Continuation Pattern

(iii)   Support and resistance

Relative Strength Index (RSI)

Relative Strength Index (RSI) is an important tool which provides indications for upcoming selling and buying opportunities in the market. By using the below formula, the RSI for the share can be determined.

$$RSI = 100 - \left[\frac{100}{1+RS} \right]$$

Where, $RS = \dfrac{\text{Average profit per day}}{\text{Average lost per day}}$

4.7 EFFICIENT MARKET HYPOTHESIS (EMH)

Q27. Explain the concept of EMH.

(OR)

Discuss in detail about Efficient Market Hypothesis.

(OR)

Explain the forms of EMH.

(OR)

What is the implication of semi-strong form market?

Ans :   **(Dec.-19, Dec.-18, Imp.)**

Introduction

An efficient market hypothesis is one in which security prices adjust rapidly to the arrival of new information and, therefore, the current prices of securities reflect all information about the security. You need to understand the meaning of the terms efficient capital market and efficient market hypothesis because of its importance and controversy associated with it.

It is in an efficient capital market, security prices adjust rapidly to the infusion of new information, and therefore currency security prices fully reflect all available information. To be absolutely correct, this is referred to as an informationally efficient market. Although the idea of an efficient capital market is relatively straightforward, we often fail to consider why capital markets should be efficient. What set of assumptions imply an efficient capital market ?

1) An initial and important premise of an efficient market requires that a large number of profit maximizing participants analyze and value securities, each independently of the others.

2) A second assumption is that new information regarding securities comes to the market in a random fashion, and timing of one announcement is generally independent of others.

3) The third assumption is especially crucial: profit maximizing investors adjust security pries rapidly to reflect the effect of new information.

The early work on efficient capital markets focused mainly on the empirical analysis In support of random walk hypothesis, without much underlying theory. In a seminal article published in 1970, Eugene Fama organized the growing empirical evidence and presented the theory in terms of a **fair game model,** arguing that the current price of a security fully reflects all available information. As a result, its expected return would be consistent with its risk.

Forms

Eugene Fama suggested that it is useful to describe three forms of efficient market hypothesis (EMH): weak-form EMH, semistrong-form EMH, and strong-form EMH.

1.   Weak-Form Efficient Market Hypothesis

The weak-form EMH asserts that security prices fully impound all security market information relating to prices, trading volumes, rates of return, block trades, insider transactions, odd-lot transactions, and so on.

2.   Semistrong-Form Efficient Market Hypothesis

The semistrong-form EMH argues that the security prices fully reflect all public information. They reflect market information (so, the weak-form EMH is subsumed under semistrong-form EMH) as well as non-market information such as macroeconomic data, industry reports, corporate announcements, price-earning ratios, price-book value ratios, dividend yields, and so on.

3.   Strong-Form Efficient Markets Hypothesis

The strong-form EMH contends that security prices reflect all available information, public as well as private. So, the strong- form EMH subsumes both the weak-form EMH and semistrong-form EMH as shown in Exhibit below. The strong-form EMH implies that no group of investors has monopolistic access to information which enables it to earn superior risk-adjusted returns.
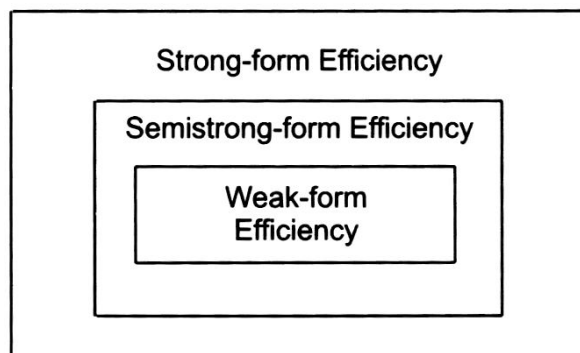
Fig. : Three Levels of Market Efficiency

Semi-strong form efficiency refers to a market where share prices fully and fairly reflect all publicly available information in addition to all past information. In such a market it is not possible to make abnormal gains by studying publicly available information such as the financial press, company financial statements and records of past share price movements. Research has shown that well-developed capital markets such as the London Stock Exchange and the New York Stock Exchange are semi-strong form efficient

Q28. Compare and contrast Weak forms and Strong form of market efficiency.

Ans :   (May-19, Imp.)

Following are the differences between weak form and strong form of market efficiency.

S.No	Weak Form Efficiency	S.No	Strong Form Efficiency
1.	It implies that security prices indicate all trade related information.	1.	It implies that security prices indicate complete information.
2.	It is also known as random walk theory.	2.	It is also known as perfect market theory.
3.	Information includes only about post sequences of returns.	3.	Information includes private or monopolistic information also.
4.	Technical traders cannot earn abnormal returns constantly in weak form.	4.	All investors cannot earn abnormal returns constantly in strong form.

Short Question and Answers

1.   Equity Valuation.

Ans :

A stock is a security which possess an ownership in the form of shares. If lends to someone then it would be in the form of bonds and debentures. This is declared publicly.

Stocks are classified in two types, namely,

1.   Preferred stocks

2.   Common stocks.

Shareholders who possess preference stocks are given first priority at the time of rendering profits when compared to shareholders who possess common stocks. Therefore, preferred stocks have an edge over the common stocks.

2.   Price to Book Value Ratio

Ans :

The book value per share is the net worth of the company (total assets minus total liabilities) divided by the number of equity shares issued. The book value is determined by economic events as well as accounting conventions. The market price of the share, in contrast, is mainly determined by how the market assesses its earning power. The ratio of market price to book value is :

PBV ratio = Price/book value ratio

$$= \frac{\text{Market price per share at time } t}{\text{Book value per share at time } t}$$

The PBV ratio has always drawn the attention of investors. During the 1990s Eugene Fama and others suggested that the PBV ratio explained to a significant extent the returns from stocks. The findings of other researches like Kim and others, however, have cast some shadow over the role of the PBV ratio.

3.   Price to Sales Ratio

Ans :

In the last few years, the price / sales ratio (PS ratio) has gained much importance as a valuation technique. The PS ratio is computed by dividing the company's current stock price by its revenue per share for the last twelve months. On the other hand, it can also be computed by dividing the present market value of equity capital by the yearly sales value of the firm. Basically, the PS ratio explains and indicates the market's willingness as to pay in exchange of one rupee of sales.

4.   Fundamental Analysis

Ans :

Investment decisions are a part of our economic life. Everybody makes such decisions in different contexts at different times. Some are able to reap more profits through them; while other simply lose their money. Attempts should, therefore, be made to understand and know the way sound investments decision can be made in order to improve the change of making profit through them. Thus, investment decision-making is an important area probing further.

5.   Company Analysis

Ans :

It is the final stage of fundamental analysis. The economy analysis provides the investor a broad outline of the prospects of growth in the economy. The industry analysis helps in investor to select the industry in which investment would be rewarding. Now he has to decide the company in which he should invest his money. Company analysis provides the answer to this question.

Company analysis deals with the estimates return and risk of individual shares. This calls for information regarding companies which can be broadly classified into two broad groups, internal and external. Internal information consists of data and events made public by companies concerning their operations.

6.   Technical analysis

Ans :

Technical analysis is a method of evaluating securities b analyzing the statistics generated b market activity, such as past prices and volume. Technical analysts do not attempt to measure a security's intrinsic value, but instead use charts and other tools to identify patterns that can suggest future activity.

Unlike fundamental analysts, technical analysts don't care whether a stock is undervalued- the only thing that matters is a security's past trading data and what information this data can provide about where the security might move in the future.

7.   Dow Theory.

Ans :

According to 'Dow Theory', the market always has three movements and the movements are simultaneous in nature. These movements may be described as:

(i)   the narrow movement which occurs from day-to-day,

(ii)   the short swing which usually moves for short time like two weeks and extends upto a month; this movement can be called a short-term movement, and

(iii)   the third movement is also the main movement and it covers four years in its duration. According to the type of movements, they have been given special names.

8.   EMH

Ans :

Introduction

An efficient market hypothesis is one in which security prices adjust rapidly to the arrival of new information and, therefore, the current prices of securities reflect all information about the security. You need to understand the meaning of the terms efficient capital market and efficient market hypothesis because of its importance and controversy associated with it.

9.   Relative Valuation

Ans :

A relative valuation model is a business valuation method that compares a company's value to that of its competitors or industry peers to assess the firm's financial worth. Relative valuation models are an alternative to absolute value models, which try to determine a company's intrinsic worth based on its estimated future free cash flows discounted to their present value, without any reference to another company or industry average. Like absolute value models, investors may use relative valuation models when determining whether a company's stock is a good buy.

Relative valuation uses multiples, averages, ratios and benchmarks to determine a firm's value. A benchmark may be selected by finding an industry wide average, and that average is then used to determine relative value.

10.   Compare and contrast Weak forms and Strong form of market efficiency.

Ans :

Following are the differences between weak form and strong form of market efficiency.

S.No	Weak Form Efficiency	S.No	Strong Form Efficiency
1.	It implies that security prices indicate all trade related information.	1.	It implies that security prices indicate complete information.
2.	It is also known as random walk theory.	2.	It is also known as perfect market theory.
3.	Information includes only about post sequences of returns.	3.	Information includes private or monopolistic information also.
4.	Technical traders cannot earn abnormal returns constantly in weak form.	4.	All investors cannot earn abnormal returns constantly in strong form.

Exercise Problems

1. The Jackson corporation has a required rate of return of 16% and its current dividend is Rs. 3 per share. If the current price is Rs. 55 per share. What is the growth rate of its dividend ?

   [Ans : Growth rate (g) = 10%]

2. The Babet corporation has been experiencing an above normal dividend growth rate of 20% per year for the last 5 years. This above normal growth rate is expected to continue for another 5 years before it levels off at a more normal rate of 6% Babet's last dividend was Rs. 0.50 per share. Determine the current value, if its required rate of return is 15%.

   [Ans : Current value P_0 = 10.14%]

3. The current divided on an equity share of Polar Technology is Rs. 3.00. Polar is expected to enjoy an above normal growth rate of 40 percent for 5 years. Thereafter, the growth rate will fall and stabilize at 12 percent. Equity investors require a return of 18 percent from polar stock. What is the intrinsic value of the equity shares of polar ?

   [Ans : Intrinsic Value (P_0) = 157.3%]

4. Ms Ruhi is trying to determine the value of Frank corporation's common stock. The earnings growth rate over his planned 6-year holding is estimated to be 10% and dividend payout ratio is 60%. The ending P/E ratio is expected to be 20 and current EPS is Rs. 4.00. If the required rate of return for this stock is 15%. What should be the price of Frank's common stock ?

   [Ans : Price of Frank's Common Stock P_0 = 73.62]

5. The equity stock of Max Limited is currently selling of ₹ 32 per share. The dividend expected next is ₹ 2.00. The investor's required rate of return on this stock is 12 percent. Assume that the constant growth model applies to Max Limited. What is the expected growth rate of Max Limited?

   [Ans : 5.75%]

6. The stock of a company has an expected growth of 55 percent. The earnings per share as per their latest balance sheet is ₹ 25. The company has declared a dividend of ₹ 40 per share. The P/E ratio as per the published financial statement is 3 and the required rate of return is 25 percent. If an investor who buys this stock for holding for a period of 5 years. What would be the present value of the shares?

   [Ans : 15.10]

Choose the Correct Answers

1. The independent directors in a board contribute much to the _____.   [c]

    (a) corporate culture   (b) production

    (c) corporate governance   (d) employee morale

2. The LIFO inventory valuation technique results in _____.   [d]

    (a) underestimation of the firm's cost of goods sold during an inflationary period

    (b) minimization of firms' income taxes during inflation

    (c) reflection of firm's true earnings during inflation

    (d) all the above

3. Which of the following items might result in dilution of corporate earnings per share at present?   [c]

    (a) convertible bonds

    (b) warrants

    (c) stock options given as incentive to top executives

    (d) all the above

4. The growth in book value per share shows the _____   [d]

    (a) rise in the share price   (b) increase in the physical assets of the firm

    (c) increase in the net worth   (d) growth in reserves

5. A common stock pay-out ratio _____.   [b]

    (a) is directly related to the company's growth rate

    (b) can be zero for a growth firm

    (c) measures the earnings of a share as a percentage of its market price

    (d) indicates the future cash dividends to be expected

6. The price-earnings ratio of a stock reflects the _____.   [b]

    (a) growth of the company

    (b) market mood for the company's stock

    (c) earnings retained and invested in the company

    (d) dividend paid out for the company's stock

7. Liquidity of a company generally measures _____.   [d]

    (a) the ability of a company to pay its employees in a timely manner

    (b) the ability to pay interest and principal on all debt

    (c) the ability to pay dividends

    (d) the ability to pay current liabilities

8.   Economic value added measures _____.   [b]

(a)   surplus made by labour   (b)   surplus created by investments

(c)   surplus made by technological improvement   (d)   surplus in an economy

9.   Degree of financial leverage (DFL) expresses the relationship between _____.   [c]

(a)   EPS and EAIT   (b)   EPS and P/E

(c)   EPS and EBIT   (d)   EPS and sales

10. The market value of the scrip is determined by _____.   [d]

(a)   the dividend declared by the company   (b)   the present status of the stock market

(c)   the number of floating shares   (d)   the interaction of demand and supply

11. According to stock market psychology _____.   [b]

(a)   investors forget the past

(b)   history repeats itself

(c)   more faith is placed in predictions of the future

(d)   (a) and (b)

Fill in the Blanks

1. _____ stocks have an edge over the common stocks.

2. _____ selection is the primary use of the tools of equity valuation.

3. _____ flow model deals with the evaluation of firms value

4. _____ ratios are used to estimate the value of the stocks by the investors rather than adopting the discounting models.

5. The _____ ratio would be higher, when the expected payout ratio is high

6. _____ decisions are a part of our economic life.

7. _____ market is a channel through which the savings of the investors are made available to the corporate bodies.

8. The _____ is the record of a country's money receipts from and payments abroad.

9. _____ is basically the excess amount left on after making a proper charge for the capital invested in the business.

10. _____ analysis is a method of evaluating securities analyzing the statistics generated market activity.

ANSWERS

1. Preferred

2. Stock

3. Free cash

4. Price-earnings

5. P/E

6. Investment

7. Stock

8. Balance of payment

9. EVA

10. Technical

Very Short Questions and Answers

1.   Intrinsic Value

Ans :

Intrinsic value is an approximation of a company's actual true value. It does not depend on market value

2.   Market Value

Ans :

The market value of a company is its value as represented by the share price of the company. Hence, market value can be considerably lower or higher than the company's intrinsic value.

3.   Book Value

Ans :

The book value per share is simply the net worth of the company (which is equal to paid up equity capital plus reserves and surplus) divided by the number of outstanding equity shares).

4.   Gross Domestic Product (GDP)

Ans :

GDP indicates the rate of growth of the economy. It represents aggregate value of the goods and services produced in the economy.

5.   P/E Ratio

Ans :

Price-earnings ratios are used to estimate the value of the stocks by the investors rather than adopting the discounting models.

5.1 DERIVATIVES

Q1. Define derivatives. Explain different types of derivatives.

Ans :

Meaning

i) A derivative is a financial instrument whose value depends on underlying assets.

ii) The underlying assets could be prices of traded securities of gold, copper, aluminum and may even cover prices of fruits and flowers.

iii) Derivatives have become important in India since 1995, with the amendment of the Securities Contract Regulation Act of 1956. Derivatives such as options and futures are traded actively on many exchanges.

iv) Forward contracts, swap and different types of options are regularly traded outside exchanges by financial institutions, banks and corporate client in over-the-counter markets. There is no single market place or an organized exchange.

v) Organized exchanges began trading in options on securities in 1973, whereas exchange traded debt options started trading in 1982. On the other hand, fixed income futures began trading in 1975, but equity related futures started trading in 1982.

vi) The reasons for debt options being stronger than futures are that stock exchanges tend to introduce those instruments that they think will be successful in trading.

Types

The most commonly used derivatives contracts are forwards, futures and options which we shall discuss in detail later.

1. **Forwards :** A forward contract is a customised contract between two entities, where settlement takes place on a specific date in the future at today's pre agreed price.

2. **Futures :** A futures contract is an agreement between two parties to buy or sell an asset at a certain time in the future at a certain price. Futures contracts are special types of forward contracts in the sense that the former are standardized exchange-traded contracts.

3. **Options :** Options are of two types – calls and puts. Calls give the buyer the right but not the obligation to buy a given quantity of the underlying asset, at a given price on or before a given future date. Puts give the buyer the right, but not the obligation to sell a given quantity of the underlying asset at a given price on or before a given date.

4. **Warrants :** Options generally have lives of upto one year, the majority of options traded on options exchanges having maximum maturity of nine months. Longer-dated options are called warrants and are generally traded over-the-counter.

5. **LEAPS :** The acronym LEAPS means Long Term Equity Anticipation Securities. These are options having a maturity of upto three years.

6. **Baskets :** Basket options are options on portfolios of underlying assets. The underlying asset is usually a moving average or a basket of assets. Equity index options are a form of basket options.

7. **Swaps :** Swaps are private agreements between two parties to exchange cash flows in the future according to a prearranged formula. They can be regarded as portfolios of forward contracts. The two commonly used swaps are:

    (i) **Interest rate swaps :** These entail swapping only the interest related cash flows between the parties in the same currency.

    (ii) **Currency Swaps :** These entail swapping both principal and interest between the parties, with the cash flows in one direction being in a different currency than those in the opposite direction.

8. **Swaptions :** Swaptions are options to buy or sell a swap that will become operative at the expiry of the options. Thus, swaptions is an option on a forward swap. Rather than have calls and puts, the swaptions market has receiver swaptions and payer swaptions A receiver swaption is an option to receive fixed and pay floating. A payer swaption is an option to pay fixed and receive floating.

5.2 OVERVIEW OF INDIAN DERIVATIVES MARKETS

Q2. Explain in detail about overview of derivative markets in India.

Ans :

i) From the past, it was evident that commodity markets were favouring the trading of derivative but in the late 1990s, the trading of financial derivatives came into existence.

ii) In 1995, various restrictions made on the options trading were prohibited with the introduction of the securities laws (amendments) ordinance. Dramatic growth was observed with the introduction of equity derivatives and stock and index derivatives.

iii) Even, it had attracted wide range of investors as several risk containment measures or regulatory measures were adopted by LC Gupta committee and JR Verma committee which have reduced the risk associated with the derivative markets.

iv) During June, 2000, trading of index futures was common on different Indian stock exchanges followed by the trading of index options and options of individual securities in 2001.

v) In Indian capital markets, the major type of securities are traded on BSE (Bombay Stock Exchange) and NSE (National Stock Exchange).

vi) Even the derivatives are traded at NSE and BSE. Recently even banks are managing their risks, namely credit risk and interest rate risk by investing into credit derivatives and interest rate derivatives.

vii) This became possible only after the promul-gation of regulatory mechanisms by Reserve Bank of India (RBI).

viii) However, credit derivatives and interest rate derivatives are incapable of making expected volume of trade.

ix) The derivative trading in commodity market has picked up expected growth after the initiatives taken by the three major stock exchanges i.e., National Multi Commodity Exchange of India, Multi Commodity Exchange of India and National Commodity and Derivative Exchange.

The derivatives growth in Indian capital market can be studied with the help of the following figure.
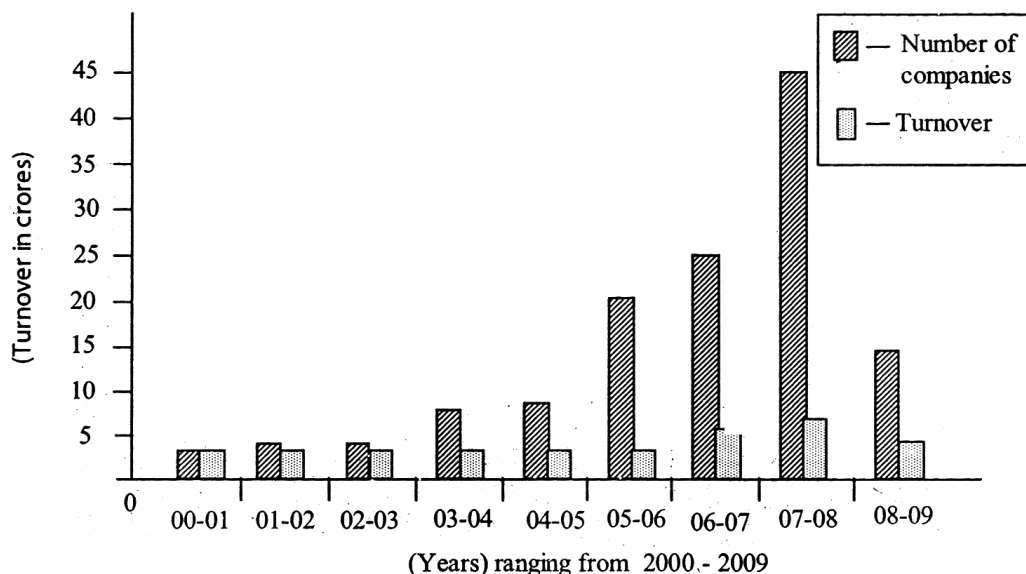
Fig.: Derivative Growth in India

It was observed that there was a drastic growth in derivatives from 2000-2007. Such growth was mediated by the reduction in the lot size of options contract from 200 to 100, then to only 50 in 2007 and also by the increased participation from the foreign institutions and domestic investors (Example, Arbitrage Funds and Portfolio Hedgers).

5.3 OPTION MARKETS

Q3.   Define option. Explain features of options.

Ans :

Meaning

Options are the important financial derivatives where the instruments have additional features of exercising an option which is a right and not the obligation. Hence, options provide better scope for risk coverage and making profit at any time within the expiration date. The price of the underlying is also derived from the underlying asset.

Options are of different types. Some are related to stock index, some with currency and interest rates. During the last three decades the option trading gained momentum though the first option in commodity was launched in 1860 in USA. Based on the sale and purchase there are two types of options: put and call. The exercise-time of an option makes it in American or European. The other category of option includes- over the counter (OTC) or exchange traded. Options can be valued either with the help of intrinsic value or with time value. There are two positions in option trading- long and short position.

Definition

Option may be defined as a contract between two parties where one gives the other the right (not the obligation) to buy or sell an underlying asset at a specified price within or on a specific time. The underlying may be commodity, index, currency or any other asset.

Features

The following features are common in all types of options.

➢ **Contract:** Option is an agreement to buy or sell an asset obligatory on the parties.

➢ **Premium:** In case of option a premium in cash is to be paid by one party (buyer) to the other party (seller).

➢ **Pay off:** From an option in case of buyer is the loss in option price and the maximum profit a seller can have in the options price.

➢ **Holder and writer** Holder of an option is the buyer while the writer is known as seller of the option. The writer grants the holder a right to buy or sell a particular underlying asset in exchange for a certain money for the obligation taken by him in the option contract.

➢ **Exercise price** There is call strike price or exercise price at which the option holder buys (call) or sells (put) an underlying asset.

➢ **Variety of underlying asset** The underlying asset traded as option may be variety of instruments such as commodities, metals, stocks, stock indices, currencies etc.

➢ **Tool for risk management** Options is a versatile and flexible risk management tools which can mitigate the risk arising from interest rate, hedging of commodity price risk. Hence options provide custom-tailored strategies to fight against risks.

Q4.   Explain different types of options.

Ans :

There are various types of options depending upon the time, nature and exchange of trading. The following is a brief description of different types of options:

1.   Put and call option

2.   American and European option

3.   Exchange traded and OTC options.

1.   Put and call option

(i)   Put option is an option which confers the buyer the right to sell an underlying asset against another underlying at a specified time on or before a predetermined date. The writer of a put must take delivery if this option is exercised. In other words put is an option contract where the buyer has the right to sell the underlying to the writer of the option at a specified time on or before the option's maturity date.

(ii) Call option is an option which grants the buyer (holder) the right to buy an underlying asset at a specific date from the writer (seller) a particular quantity of underlying asset on a specified price within a specified expiration/maturity date. The call option holder pays premium to the writer for the right taken in the option.

2.   American and European option

i)   American option provides the holder or writer to buy or sell an underlying asset, which can be exercised at any time before or on the date of expiry of the option.

ii) On the other hand a European option can be exercised only on the date of expiry or maturity.

iii) This is clear that American options are more popular because there is timing flexibility to exercise the same. But in India, European options are prevalent and permitted.

3. Exchange traded and OTC options.

i) Exchange traded options can be traded on recognized exchanges like the futures contracts.

ii) Over the counter options are custom tailored agreement traded directly by the dealer without the involvement of any organized exchange. Generally large commercial bankers and investment banks trade in OTC options.

iii) Exchange traded options have specific expiration date, quantity of underlying asset but in OTC traded option trading there is no such specification and terms are subjective and mutually agreed upon by the parties.

iv) Hence OTC traded options are not bound by strict expiration date, specific limited strike price and uniform underlying asset.

v) Since exchange traded options are guaranteed by the exchanges, hence they have less risk of default because the deals are cleared by clearing houses.

vi) On the other side OTC options have higher risk element of default due to noninvolvement of any third party like clearing houses. Offsetting the position by buyer or seller.

Q5. Compare and Contrast Call Option and Put Option.

Ans :

Sl.No.	Call Option	S.No.	Put option
1.	The owner has the right but not the obligation buy an asset on a specified date at a specified price.	1.	The owner has the right bat not die obligation to sell the asset on a specified date at the specified price.
2.	Call option consists of two persons namely, call buyers and call sellers.	2.	Put option consists of two persons namely, pot buyers and pot sellers.
3.	Call buyers are bulls who are optimistic in nature Call buyers assume that the prices would increase in future.	3.	Put buyers are bears who are pessimistic in nature. Put buyers assume that the prices would decrease in future.
4.	Therefore, call buyers buys shares in advance or makes a long position.	4.	Hence, put buyers sells shares in advance or makes a sell position.
5.	Calls sellers are bears who are pessimistic in nature. Call sellers assumes that tire prices would decrease in future.	5.	Put sellers are bulls who are optimistic in nature. Put sellers assume that the prices would increase in future.
6.	Call buyer makes a premium amount to call seller.	6.	Put buyer makes a premium amount to put seller.
7.	If prices increase, call seller has to buyer.	7.	If prices decrease, put seller has to pay to put buyer.

	8.	If prices decrease in future then call call buyer will just loose his premium and die option is closed		8.	If prices increase then pot buyer anil just loose his premium and the option comes to an end.
	9.	For call buyers, profits are unlimited and losses are limited.		9.	For pot buyers, profits are unlimited and losses are limited.
	10.	For call sellers, profits are limited and losses are unlimited.		10.	For put sellers, profits are limited and losses are unlimited

Q6.   Compare and contrast American and European Options.

Ans :

Sl.No.	American Option	S.No.	European Option
1.	Options are exercised on or before the settlement data i.e., either today, tomorrow or at any trading day until the life of the contract. No specific expiration date.	1.	Options are exercised only on the settlement date but not on today, tomorrow or any trading day. Expiration date is specific.
2.	Majority of stock options opt for American options.	2.	Europen options are less frequently traded when compared to American option.
3.	The price of the otpion is usually high as it assumes high risk thereby charging high risk premium.	3.	The price of the option is low because it is less risky and charges less risk premium.
4.	Firm, as sson as it realises profits is liable to take delivery of the under-lying asset on any day and hence can end the contract.	4.	Even though firm realises profits, is liable to take delivery of the underlying asset only on the expiration date.

5.4 OPTION STRATEGIES

Q7.   Discuss briefly about various option strategies.

Ans :   **(Dec.-18, Imp.)**

Introduction

Option strategies are plans implemented by an options trader to maximize profits and minimize risk. An option strategy involves combining options' positions on an underlying asset, typically a stock. Option strategy is the purchase and/or sale of one or various option positions and possibly on underlying option. Options strategy is a set of options positions to achieve a particular risk/return profile.

Through the option strategy, a trader can increase the value of his/her holidays significantly irrespective of the direction of the stock price movement. With this options strategy, an investor can lose money only if the underlying stock retains its value over a period of time or its price deviates only marginally.

Finally, the hedge can be constructed by buying an option and selling the option or by combination of both i.e., (basic and advanced option strategies) and there are other more advanced sophisticated hedging techniques with options which are use by option traders.

Basic Option Strategies

There are two advanced strategies of option are as follows:

1.   Bullish Strategies

2.   Bearish Strategies

Basic Options Strategies

Bullish Strategies

— Protective Put

— Covered Call

— Long Call (Buy Call)

— Short Put

Bearish Strategies

— Short Call
— Long Put
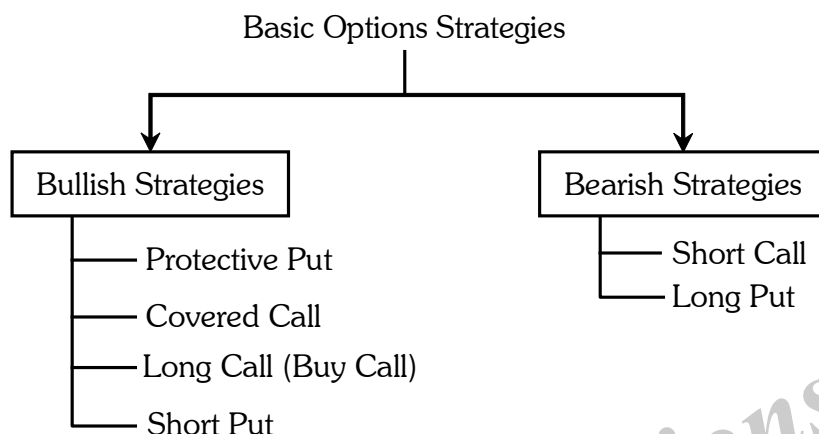
1.   Bullish Strategies

Following are the bullish strategies:

i)   Protective Put

This is the result of long the underlying asset and long put options. A protective put strategy has a very similar payoff profile to the long call. The maximum loss is limited to the premium paid for the option and can have an unlimited profit potential.

Protective puts are ideal for investors whom are very risk averse, i.e., they hold stock and are concerned about a stock market correction. So, if the market does sell off rapidly, the value of the put options that the trader holds will increase while the value of the stock will decrease. If the combined position is hedged then the profits of the put options will offset the losses of the stock and all the investor will loose will be the premium paid.

ii)   Covered Call

This is the result of long the underlying asset and short the call options. This strategy is used by many investors who hold stock. It is also used by many large funds as a method of generating consistent income from the sold options.

The idea behind a covered call, also called Covered Write, is to hold stock over a long period of time and every month or so sell out-of-the-money call options.

Even though the payoff diagram shows an unlimited loss potential, one must remember that many investors implementing this type of strategy have bought the stock long ago and hence the call option's strike price may be a long way from the purchase price of the stock.
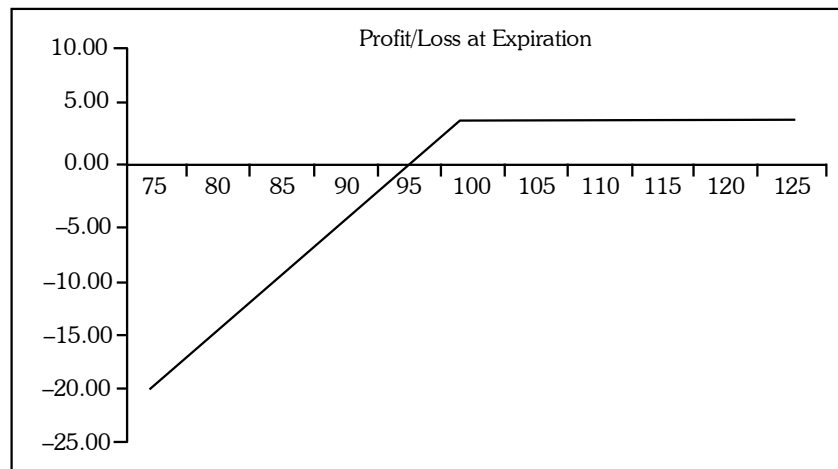
Maximum Loss: Unlimited on the downside.

Maximum Gain: Limited to the premium received from the sold call option.

iii) **Long Call (Buy Call) :** A long call is simply the purchase of one call option. A long call option is the simplest way to benefit if we believe that the market will make an upward move and is the most common choice among first time investors. Being long a call option means that we will benefit if the stock/future rallies, however, our risk is limited on the downside if the market makes a correction.

Long call is used when the investor expects market to be very bullish and the underlying stock/index/ asset to be very volatile. It is advised to buy the lowest strike price call option (in-the-money) and choose sufficient holding period. But in case, the expected business does not take place, the investor must exit the position immediately or create another position to offset the loss.
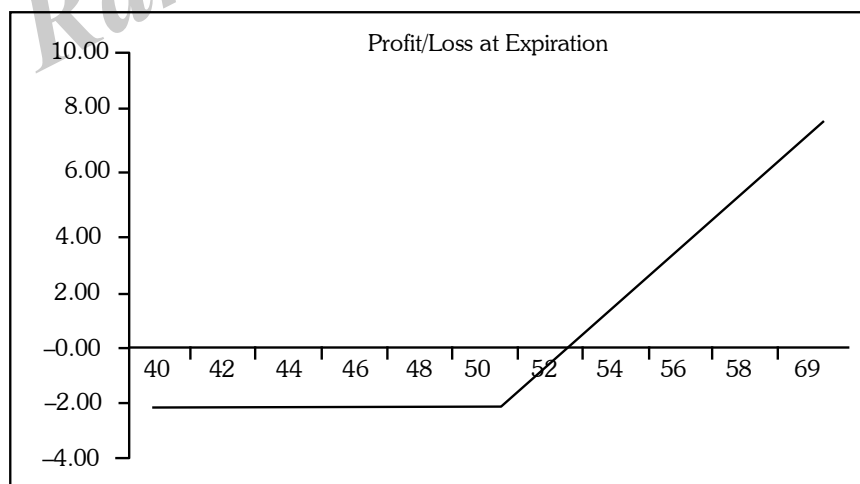
Fig.: Profit/Loss at expiration for long call

Maximum Loss: Limited to the premium paid upfront for the option.

Maximum Gain: Unlimited as the market rallies.

When to Use: When investor are bullish on market direction and also bullish on market volatility.

Upside Potential: The price of the option increases as the price of the underlying rises. Investor can book profit by selling the same option at higher price whenever investor think that the underlying price has come to the level he expected. At expiration the break-even underlying price is the strike price plus premium paid for buying the option.

Downside Risk: The investor loss is limited to the premium he has paid. The maximum one can lose is the premium, if the underlying price is below the strike price at expiry of the option.

iv) **Short Put :** A short put is simply the sale of a put option. Like the short call option, selling naked puts can be a very risky strategy as our losses are unlimited in a falling market. The written put can provide the investor with extra income (premium received on put option) in stable to rising markets. Most investors use this strategy as a method of buying stocks at cheaper rate. Short put is used when the investor expects the share price/index to remain steady or be slightly bullish over the life of the option.
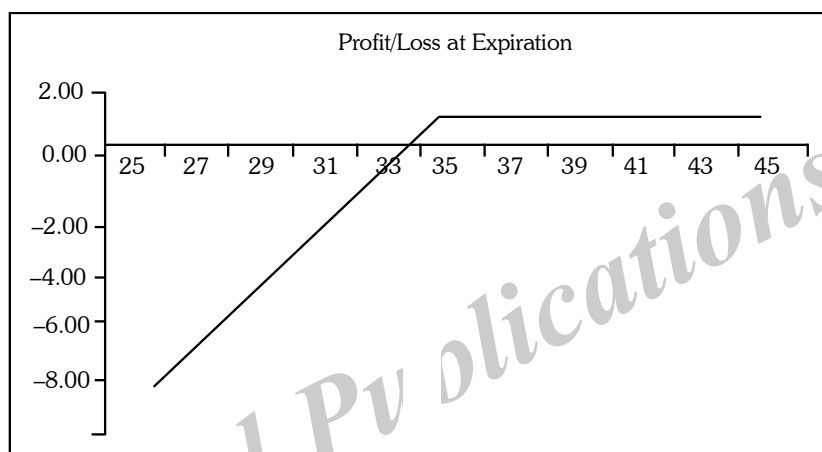
Fig. : Profit / Loss at Expiration for Short Put

Maximum Loss: Unlimited in a falling market.

Maximum Gain: Limited to the premium received for selling the put option.

When to Use: When one is bullish on market direction and bearish on market volatility.

Upside Potential: Investor profit is limited to the premium received. At expiration, the break-even is strike price minus premium. Maximum profit is realized if the underlying price is above the strike price.

Downside Risk: The price of the option increases as the underlying falls. One can cut the losses by buying the same option if one thinks that the view is going to be wrong. Losses keep on increasing as the underlying falls and are virtually unlimited. Such a position must be monitored closely. The investor must write puts only if he has the financial capacity to buy the underlying shares should they be exercised by the put buyer.

2. **Bearish Strategies**

Following are the bearish strategies:

i) **Short Call:** A short call is simply the sale of one call option. A selling option is also known as "writing an option". A short is also known as a naked call. Naked calls are considered very risky positions because the risk is unlimited.
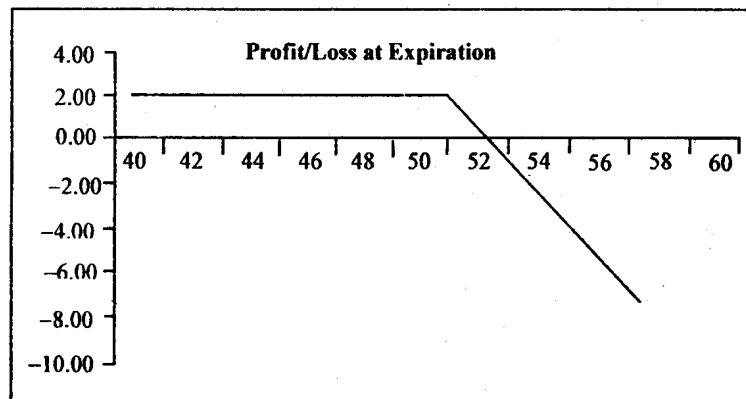
Fig. : Profit / Loss at Expiration for Short Call

Upside Potential: The investor's profit is limited to the premium received. At expiration the break-even is strike price plus premium. Maximum profit is realized if the underlying price is below the strike price.

Downside Risk: The price of the option increases as the underlying price rises. The investor can cut his losses by buying the same option if he thinks that his view is going wrong. Losses keep on increasing as the underlying rises and are virtually unlimited. Such a position must be monitored closely.

Maximum Loss : Unlimited as the market rises.

Maximum Gain : Limited to the premium received for selling the option.

When to **Use:** When the investors are bearish on market direction and also bearish on market volatility.

ii) **Long Put:** A long put is simply the purchase of one put option. Like the long call, a long put is a nice simple way to take a position on market direction without risking everything. Except with a put option the investor want the market to decrease in value. Buying put options is a fantastic way to profit from a down turning market without shorting stock. Even though both methods will make money if the market sells off, buying put options can do this with limited risk.
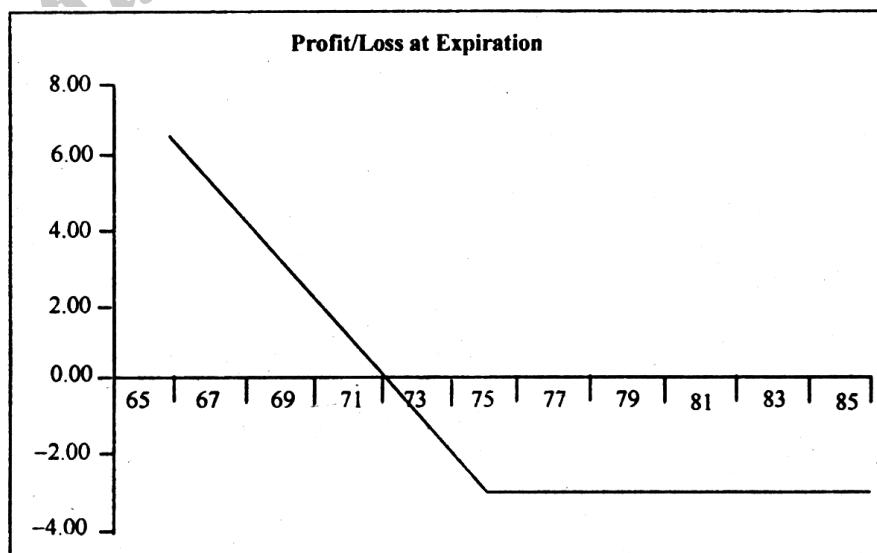
Fig. : Profit / Loss at Expiration for Long Put

Upside Potential: The price of the option increases as the price of the underlying price falls. The investor can square up his position by selling the same option at a higher price whenever he think that the underlying price has come to the level he expected. At expiration the break-even underlying price is the strike price minus premium paid for buying the option.

Downside Risk: The investor's loss is limited to the premium he has paid. The maximum he can lose is the premium, if the underlying price is above the strike price at expiry of the option.

Maximum Loss: Limited to the net premium paid for the option.

Maximum Gain: Unlimited as the market sells off.

When to Use: When the investors are bearish on market direction and bullish on market volatility.

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5.5 OPTION VALUATION

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Q8. Discuss the various methods of option valuation.

Ans : (Dec.-18, Imp.)

The following two methods are used for valuation of option prices :

1. **Black and Scholes option pricing model (BSOPM)**

   Refer to Unit-V, Q.No. 9.

2. **Binomial option pricing model (BOPM)**

   Refer to Unit-V, Q.No. 10.

Q9. What are the assumptions of Black and Scholes option pricing model?

Ans : (April-22, Dec.-19, Imp.)

Meaning

The black and scholes option pricing model is the most commonly used option pricing model in finance. It was initially developed in 1973 by two academicians fisher Black and Myron scholes and was designed to price European option on non dividend paying stocks after that they developed consultancy org to do many recommendation at corporate sector. Later on some adjustment are made regarding - payment of dividend income. This model is also applicable for American option now days most of the option are made on American style (or) option.

Assumptions

This model is based on the following assumptions.

1. Stock-price behaviour corresponds to the normal log distribution.

2. The risk rate of the stock (s) remains constant in the option contract period.

3. There no taxes (or) transaction cost.

4. All securities are perfectly divisible.

5. No dividend payment on stock during the period of option if the dividend is expected during the period of option that can be adjusted as per unit price.

6. There are no risk less arbitragues opportunities.

7. Stock trading is continuous

8. Investor can borrow or lend at the risk free rate of interest.

9. The slit term risk free interest (r) is constant.

Formula's for Determination of Option Price

The following formulas are used for determination of value of call and put option.

Call option

$$C = S \cdot N(d_1) - ke^{-r.T} \cdot N(d_2)$$

Put Option

$$P = k.e^{-r.T}N(-d_1) - S.N(d_2)$$

where

d_1 d_2 values are cal as below

$$D_1 = \frac{In \cdot \left(S/K\right) + r \cdot T}{\sigma \sqrt{T}} + \sigma \sqrt{T}$$

$$d_2 = d_1 - \sigma\sqrt{T}$$

where

S = Call option price

S = Stock market price

k = Strike price

$N(d_1)$ = The value of normal distribution for d_1,

e = Exponential value

r = Risk free rate return

T = Option contract time period

$N(d_2)$ = The value of normal distribution for d_2

P = Put option value

In = Natural log value for the ratio of market price and strike price of the stock.

σ = Std deviation (or) Variability ratio

Q10. Define Binomial Option Pricing Model and Explain the assumptions of Binomial Option Pricing Model.

Ans :

Meaning

i) The Binomial Option Pricing Model is an options valuation method developed by Cox in 1979.

ii) It is a very simple model that uses an iterative procedure to price options, allowing for the specification of nodes, or points in time, during the time span between the valuation date and the option's expiration date.

iii) When compared to the Black Scholes model and other complex models, the binomial option pricing model is mathematically simple and easy to use.

iv) The model lowers the possibilities of price changes and is based on the concept of no arbitrage, it assumes a perfectly efficient market, and shortens the duration of the option.

v) Under these simplifications, it is able to provide a mathematical valuation of the option at each node specified.

Assumptions

1. There are only two possible prices for the underlying asset on the next day. From this assumption, this model has got its name as Binomial option pricing model (Bi means two)

2. The two possible prices are the up-price and down-price

3. The underlying asset does not pay any dividends

4. The rate of interest (r) is constant throughout the life of the option

5. Markets are frictionless i.e. there are no taxes and no transaction cost

6. Investors are risk neutral i.e. investors are indifferent towards risk

Binomial option model building process

Let us consider that we have a share of a company whose current value is S_0. Now in the next month, the price of this share is going to increase by u% (up state) or it is going to go down by d% (down state). No other outcome of price is possible for this stock in next month. Let p be the probability of up state. Therefore the probability of down state is 1-p.
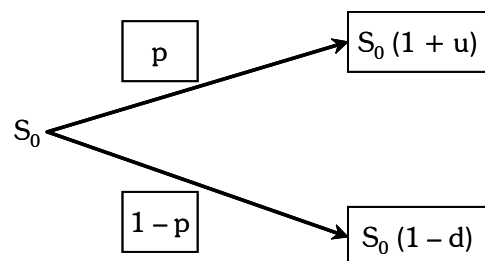
Now let us assume that call option exists for this stock which matures at the end of the month. Let the strike price of the call option be X. Now in case, the option holder decides to exercise the call option at the end of month, what will be the payoffs?

The payoffs are given in the diagram below
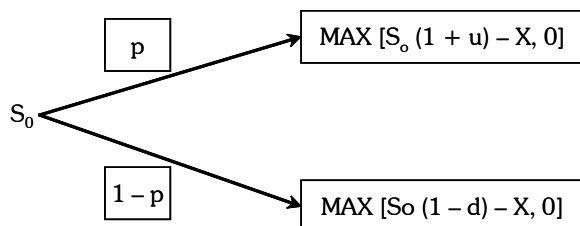
Now, the expected payoff using the probabilities of up state and down state. From the above diagram, the expected value of payoff is

p^+ MAX [S_O(1+u) – X, 0] + (1-p)+ MAX [S_o(1– d) – X, 0]

Once the expected value of the payoff is calculated, this expected value of payoff has to be discounted by risk free rate to get the arbitrage free price of call option. Use continuous discounting for discounting the expected value of the payoff.

In some questions, the probability of up state is not given. In such a case, probability of up state can be calculated with the formula

$$p = \frac{e^{rt} - D}{U - D}$$

Where;

p = up state probability

r = risk free rate

d = Down state factor

u = Up state factor

Using the above the model building process, similar model can be build for multi period options and also for put options.

1.   Binomial option pricing models are mathematically simple to use.

2.   Binomial option pricing model is useful for valuing American options in which the option owner has the right to exercise the option any time up till expiration.

3.   Binomial option model is also useful for pricing Bermudian options which can be exercised at various points during the life of the option.

Limitations

i)   One major limitation of the binomial option pricing model is it is slow speed and complex.

ii) Complexity of computation is increased twofold in multi-period binomial option pricing model.

PROBLEMS

1.   **From the following details calculate the price of call option Black-Shoes models market price of share is Rs. 92 and strike price of share Rs. 95 and time period 50 days option expires on Dec. 21ˢᵗ 2002 option contract is made on 11ᵗʰ Nov. 2002 and risk free rate of interest is 7.12% p.a. S.D is 35%.**

Sol :

$$C = S.D(d_1) - k.e^{-r.T}. N(d_2)$$

$$d_1 = \frac{In \left(\frac{S}{K}\right) + r.T}{\sigma\sqrt{T}} + 0.5\ \sigma\sqrt{T}$$

Strike price of share = 95

Spot and market price of share = 92

Time price = 50

$$d_1 = \frac{In \left(\frac{92}{95}\right) + 0.0712 \times \frac{50}{365}}{0.35 \times \sqrt{\frac{50}{365}}}$$

$$+ 0.5 \times .35 \times \sqrt{\frac{50}{365}}$$

$$d_1 = \frac{-0.03208 + 0.0712 \times 0.13699}{0.35 \times 0.01937}$$

$$+ \; 0.5 \times 0.35 \times 0.01937$$

$$d_1 = \frac{-0.03208 + 0.00975}{0.1295} + 0.06475$$

$$d_1 = \frac{-0.02233}{0.1295} + 0.06475$$

$$d_1 = -.17263 + 0.06475$$

$$= -0.10788$$

Normal $d_1 = 0.4562$

$$\boxed{d_2 = d_1 - \sigma\sqrt{T}}$$

$$d_2 = 0.4562 - 0.35 \sqrt{\frac{50}{365}}$$

$$= -0.10788 - 0.35 \times 0.3701$$

$$= -0.10788 - 0.1295$$

$$= -0.2375$$

$Nd_2 = 0.4052$

$$\boxed{C = S.N(d_1) - k.e^{-r.T} . N(d_2)}$$

$$C = (92 \times 0.4562) - 95 \; e^{-0.712 \times \frac{50}{365}} \times 0.4052$$

$$C = 41.9704 - 95 \; e^{-0.00975} \times 0.4052$$

$$C = 41.9704 - 95 \times 0.9902 \times 0.4052$$

$$C = 41.9704 - 94.078 \times 0.4052$$

$$C = 41.9704 - 38.1203$$

$$C = 3.85.$$

2. **Mr. Shaker wants to earn by writing call option on RIL's stock the current price of stock is Rs. 28 and shaker wants to write a four month call option with the strike price of Rs. 30/- Mr. shaker wants to determine the appropriate premium to charge for call option. The stock S.D is 30% the risk less rate of interest is 10% p.a. determine the premium value of call option.**

Sol :

Market price = 28

S.Price = 30

S.D = 0.30

r = 10%

T = 4 months

$C = S.N(d_1) - ke^{-r.T} . N d_2$

$$d_1 = \frac{\ln\left(S/K\right) + r.T}{\sigma\sqrt{T}} + 0.5 \; \sigma \; \sqrt{T}$$

$$d_1 = \frac{\ln\left(\frac{28}{30}\right) + 0.10 \times \frac{4}{2}}{0.30 \sqrt{0.334}}$$

$$\times 0.5 \times 0.3 \times \sqrt{0.33}$$

$$d_1 = \frac{-0.06899 + 0.10 \times 0.33}{0.172} \times 0.0866$$

$$d_1 = \frac{-0.0359}{0.1732} \times 0.0866$$

$$d_1 = -0.20779 \times 0.0866$$

$$d_1 = -0.1206$$

$$\boxed{\rightarrow \; \text{Normal table} \Rightarrow 1 \text{ under } 2}$$

$Nd_1 = 0.4522$

$$d_2 = d_1 - \sigma \sqrt{T}$$

$$= -0.1206 - 0.30 \sqrt{0.334}$$

$$= -0.1206 - 0.1732$$

$$= -0.2927$$

$Nd_2 = 0.3859$

$$C = (28 \times 0.4522) - 30e^{-0.1 \times 0.334} \times 0.3859$$

$$C = 12.6612 - 30e^{-0.0334} \times 0.3859$$

$$C = 12.6616 - 29.0145 \times 0.3859$$

$$C = 12.6616 - 11.1967$$

$$C = 1.4649/-$$

3. **Consider the following data stock price Rs. 50. Months to expiration is three month risk free rate of int 10 p.a S.D of stock 40% excise price Rs. 55. Calculate the value of call option.**

Sol :

$$\boxed{C = S.N(d_1) - k.e^{-r.T} - N(d_2)}$$

$$d_1 = \frac{\ln\left(S/K\right) + r.T}{\sigma\sqrt{T}} + 0.5\,\sigma\,\sqrt{T}$$

$$d_1 = \frac{\ln\left(\frac{50}{55}\right) + 0.10.\left(\frac{3}{12}\right)}{0.40\,\sqrt{\frac{3}{12}}} + 0.5$$

$$+ 0.4 \times \sqrt{\frac{3}{12}}$$

$$d_1 = \frac{-0.0953 + (0.01 \times 0.25)}{(0.40)\,(0.5)}$$

$$+ (0.5)\,(0.4 \times 0.5)$$

$$d_1 = \frac{-0.0953 + 0.025}{0.2} + 0.1$$

$$d_1 = \frac{-0.0703}{0.2} + 0.1$$

$$d_1 = -0.3515 + 0.1$$

$$d_1 = -0.2515 = 0.4013$$

$$Nd_2 = d_1 - \sigma\sqrt{T}$$

$$Nd_2 = -0.2515 - 0.40\,\sqrt{\frac{3}{12}}$$

$$Nd_2 = -0.2515 - (0.40 \times 0.5)$$

$$Nd_2 = -0.2515 - 0.2$$

$$Nd_2 = -0.4515$$

$$Nd_2 = 0.3264$$

$$\boxed{C = S.N(d_1) - k.e^{-r.T}.N(d_2)}$$

$$C = 50.(0.4013) - 55.e^{-0.10 \times \frac{3}{12}}.(0.3264)$$

$$C = 20.065 - 55\,e^{-0.10 \times 0.25}.(0.3264)$$

$$C = 20.065 - 55\,e^{-0.025}\,(0.3264)$$

$$C = 20.065 - 55\,(0.975)\,(0.3264)$$

$$C = 20.065 - 55\,(0.3184)$$

$$C = 20.065 - 17.50876$$

$$C = 2.56$$

$$Nd_1 = 2 \text{ under } 5$$

$$\text{is } 0.4013$$

$$Nd_2 = 4 \text{ under } 5$$

$$\text{is } 0.3264.$$

5.6 FORWARD & FUTURE MARKETS

Q11. Define forward market. Explain the features of forward market.

Ans :

Meaning

i) Forwards are the oldest of all derivatives.

ii) It is an agreement between two parties to buy or sell an asset at a certain date in future at a predetermined price.

iii) The promised asset may be currency, commodity, instrument like shares / debentures etc.

iv) Forward contracts are normally traded outside stock exchanges. They are popular on the over the counter market.

v) In a forward contract, the party who promises to buy the specified asset at an agreed price at a future date is said to be in the 'long position' and party who promises to sell is said to be in 'short position'.

vi) Thus, long position and short position takes the form of buy and sell in a forward contract.

Features

1. Bilateral Contract

Forward contract is a bilateral contract between a buyer and a seller hence it is subject to counter-party risk.

2.   Over The Counter Trading (OTC)

Forward contracts are private contracts hence traded over the counter and not in exchanges. The contract can be modified as per the requirements of parties.

3.   Custom Designed

Forward contract is a custom designed contract between two parties. It contains features in terms of size of contract, date of expiry, type and quality of asset etc.

4.   Physical delivery

There is no physical delivery of assets at the time of entering the contract. Physical delivery takes place only on expiry date.

5.   Settlement At Maturity

Money is exchanged only on the maturity as stated in the contract. The asset must be delivered on maturity date on receipt of payment.

6.   Need For Intermediary

Mostly parties enter into a forward contract with the help of some intermediary. It can be a bank or financial institution or any other party.

Q12. Explain the classifications of Forward Contracts.

Ans :

Forwards contracts in India are broadly governed by the Forward Contracts (regulation) Act, 1952. According to this act, forward contracts are of the following three major categories:

1.   Fixed Term and Optional Term Forward Contract

Both buying and selling forward exchange contracts may be either fixed or optional term contracts.

i)   Fixed Term Contracts: Fixed Term Contracts allow the customer to specify the date when the delivery of the overseas currency will occur. Earlier delivery is usually an option however a marginal adjustment to the Forward Contract Rate may be required.

ii)   Optional Term Contracts: Optional Term Contracts allow the customer to enter in to an agreement for a specific period, where

the customer declares a certain period within which they would like the delivery to be made (this normally occurs for periods shorter than one month), e.g., a customer may enter a contract for a six month period while having the option of receiving a delivery anytime during the final week.

2.   Hedge Contracts

These are freely transferable contracts which do not require specification of a particular lot size, quality or delivery standards for the underlying assets. Most of these are necessary to be settled through delivery of underlying assets.

3.   Transferable Specific Delivery Forward Contracts

Apart from being freely transferable between parties concerned, these forward contracts refer to a specific and predetermined lot size and variety of the underlying asset. It is compulsory for delivery of the underlying assets to take place at expiration of contract.

4.   Non-Transferable Specific Delivery Forward Contracts

These contracts are normally exempted from the provision of regulation under Forward Contract Act, 1952 but the Central Government reserves the right to bring them back under the Act when it feels necessary. These are contracts which cannot be transferred to another party. The contracts, the consignment lot size and quality of underlying asset are required to be settled at expiration through delivery of the assets.

5.   Other Forward Contracts

i)   Forward Rate Agreements (FRA): Forward contracts are commonly arranged on domestic interest-rate bearing instruments as well as on foreign currencies. In forward rate agreement, no actual lending or borrowing is affected. Only it fixes the rate of interest for a futures transaction.

ii)   Range Forwards: These instruments are very much popular in foreign exchange markets. Under this instrument, instead of quoting a single forward rate, a quotation

is given in terms of a range, i.e., a range may be quoted for Indian rupee against US dollar at ₹ 47 to ₹ 49. It means there is no single forward rate rather a series of rate ranging from ₹ 47 to ₹ 49 has been quoted. This is also known as flexible forward contracts.

Q13. Define Future Contracts. Explain the features of future contract.

Ans :

Meaning

A future contract is an agreement between two parties to buy or sell an asset at a certain time in future, at a certain price. Future contracts are traded in standardised stock exchanges. A future contract may be offset prior to maturity by entering into an equal and opposite transaction.

Features

1. Exchange Traded

Future Contracts are generally traded on an exchange. The exchanges provide a mechanism of guarantee to honour the contract. So there is secondary market for futures.

2. Standardised

Future contracts are highly standardised and legally enforceable. There is lack of flexibility.

3. Types of Future

Future contracts can be classified into two:-

(a) Commodity future in which underlying asset is a commodity

(b) Financial future in which the underlying asset is a security or bond.

4. Transparency

The contracts enjoy a fair degree of transparency. The terms and conditions are published by exchanges.

5. Down Payment

In future contracts, the contracting parties have to deposit a certain percentage of contract price called as Margin Money with the exchange. It acts as a collateral to support the contract.

6. Delivery Of Asset

In future contract the parties only exchange the difference between the future price and the spot price prevailing on the date of maturity.

7. Settlement

A future contract is always settled daily, irrespective of maturity date. It is marked to market on a daily basis. The difference between future price and spot price on a day constitutes either profit or loss.

Q14. Explain different types of future contracts.

Ans :

Financial futures contracts can be categorised into following types:

1. Interest rate futures: In this type the futures securities traded are interest bearing instruments like T-bills, bonds, debentures, euro dollar deposits and municipal bonds, notional gilt-contracts, short term deposit futures and treasury note futures.

2. Stock index futures: Here in this type contracts are based on stock market indices. For example in US, Dow Jones Industrial Average, Standard and poor's 500 New York Stock Exchange Index. Other futures of this type include Japanese Nikkei index, TOPIX etc.

3. Foreign currency futures: These future contracts trade in foreign currency generating used by exporters, importers, bankers, FIs and large companies.

4. Bond index futures: These contracts are based on particular bond indices i.e. indices of bond prices. Municipal Bond Index futures based on Municipal Bonds are traded on CBOT (Chicago Board of Trade).

5. Cost of living index future: These are based on inflation measured by CPI and WPI etc. These can be used to hedge against unanticipated inflationary pressure.

Q15. Explain the Functions of futures markets.

Ans :

The important functions of futures market are described as follows:

1. Hedging function

The primary function of the futures market is the hedging function which is also known as price

insurance, risk shifting or risk transference function. Futures markets provide a vehicle through which the traders or participants can hedge their risks or protect themselves from the adverse price movements in the underlying assets in which they deal.

2.   Price discovery function

Another important function of futures market is the price discovery which reveals information about futures cash market prices through the futures market. Further, price discovery function of the futures market also leads to the inter temporal inventory allocation function.

3.   Financing function

Another function of a futures market is to raise finance against the stock of assets or commodities. Since futures contracts are standardized contracts, so, it is easier for the lenders to ensure quantity, quality and liquidity of the underlying asset.

4.   Liquidity function

It is obvious that the main function of the futures market deals with such transactions which are matured on a future date. They are operated on the basis of margins. Under this the buyer and the seller have to deposit only a fraction of the contract value, say 5 percent or 10 percent, known as margins. This practice ensures honouring of the future deals and hence maintain liquidity.

5.   Price stabilization function

Another function of a futures market is to keep a stabilizing influence on spot prices by reducing the amplitude of short term of fluctuations. In other words, futures market reduces both the heights of the peaks and the depth of the troughs.

6.   Disseminating information

Aside from the above mentioned functions of the futures markets like risk-transference (hedging), price discovery, price stabilization, liquidity, and financing, this market is very much useful to the economy too. Since in futures market, futures traders' positions are marked to market on daily basis, which is known as daily resettlements.

Q16. Explain the participants of futures markets.

Ans :

Usually financial derivatives attract three types of traders which are discussed here as under:

1.   Hedgers

Generally there is a tendency to transfer the risk from one party to another in investment decisions. Put differently, a hedge is a position taken in futures or other markets for the purpose of reducing exposure to one or more types of risk. A person who undertakes such position is called as 'hedger'.

2.   Speculators

A speculator is a person who is willing to take a risk by taking futures position with the expectation to earn profits. Speculator aims to profit from price fluctuations. The speculator forecasts the future economic conditions and decides which position (long or short) to be taken that will yield a profit if the forecast is realized.

3.   Speculators are of two types

Day traders and position traders. (1) Position speculator uses fundamental analysis of economic conditions of the market and is known as fundamental analyst, (2) Whereas the one who predicts futures prices on the basis of past movements in the prices of the asset is known as technical analyst.

4.   Arbitrageurs

Arbitrageurs are another important group of participants in futures markets. They take advantage of price differential of two markets. An arbitrageur is a trader who attempts to make profits by locking in a riskless trading by simultaneously entering into transactions in two or more markets. In other words, an arbitrageur tries to earn riskless profits from discrepancies between futures and spot prices and among different futures prices.

Q17. Explain the Advantages of and Future Contracts.

Ans :

Advantages

1.   Protection Against Price Fluctuations

Parties to contract can protect themselves against the risk of heavy fluctuations in price of underlying assets.

2.   Flexibility

Parties to forward contract can modify the agreement as per their convenience.

3.   Facilitates Planning

These contracts facilitates planning to buy / sell assets at the time when they are most required.

4.   Bulk Transactions

The forward / future contracts facilitates bulk purchase or sale of assets at short notice in advance of delivery.

5.   Portfolio Management

Portfolio managers can advice their clients for future contracts to avoid heavy fluctuations in prices.

6.   Development of Financial Market

Future and forward contracts facilitates the growth and development of financial markets - Capital Markets as well as Money Markets.

7.   Cash Management

In forward contract payment is done at maturity on delivery of asset. In future contract only margin money is to be paid. So these contracts do not require payment of purchase price at the time of contract.

Q18. Distinction between Futures and Forwards Contracts.

(OR)

Compare and contrast Futures and Forward contract.

(OR)

Distinguish between futures and forwards.

Ans :   **(April-22, May-19, Dec.-18, Imp.)**

Sl.No.	Futures Market	Sl.No.	Forward Markets
1.	Trading is conducted in a competitive arena by "open outcry" of bids, offers, and amounts.	1.	Trading is done by telex or telephone, with participants generally dealing directly with broker-dealers.
2.	Contract terms are standardized with all buyers and sellers negotiating only with respect to price.	2.	All contract terms are negotiated privately by the parties.
3.	Non-member participants deal through brokers (exchange members who represent them on the exchange floor.	3.	Participants deal typically on a principal-to-principal basis.
4.	Participants include banks, corporations financial institutions, individual investors, and speculators.	4.	Participants are primarily institutions dealing with one other and other interested parties dealing through one or more dealers.
5.	The clearing house of the exchange becomes the opposite side to each cleared transactions; therefore, the credit risk for a futures market participant is always the same and there is no need to analyze the credit of other market participants.	5.	A participant must examine the credit risk and establish credit limits for each opposite party.
6.	Margins deposits are to be required of all participants.	6.	Typically, no money changes hands until-delivery, although a small margin deposit might be required of nondealer customers oncertain occasions.
7.	Settlements are made daily through the exchange clearing house. Gains on open positions may be withdrawn and losses are collected daily.	7.	Settlement occurs on date agreed upon between the parties to each transaction.
8.	Long and short positions are usually liquidated easily.	8.	Forward positions are not as easily offset or transferred to other participants.
9.	Settlements are normally made in cash, with only a small percent age of all contracts resulting actual delivery.	9.	Most transactions result in delivery.
10.	A single, round trip (in and out of the market) commission is charged. It is negotiated between broker and customer and is relatively small in relation to the value of the contract.	10.	No commission is typically charged if the transaction is made directly with another dealer. A commission is charged to both buyer and seller, however, if transacted through a broker.
11.	Trading is regulated.	11.	Trading is mostly unregulated.
12.	The delivery price is the spot price.	12.	The delivery price is the forward price.

Q19. Explain the determination Future prices.

Ans :

1.   For Stock Index Future and Stocks

(a)   For stock index future and stocks

$$\boxed{F = Se^{rT}}$$ F = future price

Where   S = spot rate

                        r = risk free rate

                        T = time period

(b)   When yield on underlying is estimated during the future period.

$$\boxed{F = Se^{(r-q)T}}$$ q = % of yield

2.   For commodities

(a)   When storage or holding cost is not estimated

$$\boxed{F = Se^{r.T}}$$

(b)   When storage or holding cost is estimated

$$\boxed{F = (S + U)e^{r.T}}$$

U = Holding cost (or) Carrying cost

U : It must be converted into present value present value of holding cost = Ue^{-rT}

PROBLEMS

4.   Consider a 3 month future contract on the S&P 500 market suppose that the stocks underlying the index provides dividend yield of 1% p.a that the current value of the index is 800 and the continuously compounding risk free interest rate is 6%/p.a determine the future price for the stock index.

Sol :

The future contract is relating to stock index and dividend yield rate is given so, the following formula is applied.

$$F = S.e^{(r-q)T}$$

S = 800; r = 6% q = 1%

T = 3/12

$F = 800 \times e^{(0.06-0.01) \times 3/12}$

F = 810.063

When stock index is raising it is implied that the share price may also be increased.

5.   The spot price of a bond is Rs. 900 and one year future rate is Rs. 930. Interest payments of Rs. 40 are due after 6 months and after one year from today. The risk free rate of interest for 6 months and one year period are 9% and 10% respectively. Find out the profit of the investors. What should be his strategy if he holds one bond and the futures price is Rs. 905?

Sol :   (Aug.-21)

Spot Price = Rs. 900

Future rate = Rs. 930

Interest = Rs. 40 payable after 6 months and 1 year

Rism free rate of interest = 9% and 10%

Present value of interest amount @ 9% due after 6 months is

$P_{11} = 40 \times e^{-0.9 \times 0.5}$

$P_{11} = 38.24$

Investor should borrow Rs. 900 today to buy one determine out of Rs. 900, 38.25 is borrowed for 6 months which can be paid along with 9% interest from Rs. 40 (first interest).

The remaining balance Rs. 861.76 (900 – 38.24) is bunowed @ 10% for 1 year which will become Rs. 952.39 along with interest.

$= 861.76 \times e^{o|x|}$

= Rs. 952.39

The amount owing at the ned of your is Rs. 952.39.

After one year, invester would receive Rs. 930 from futures and Rs. 40 from interest. Total amount receivable is 930 + 40 = Rs. 970. Out of this amount, investor would pay Rs. 952.39 for loan. Profit gained by investor would be Rs. 17.61 (970 – 952.39). This strategy can be presented as follows :

Time present → Buy one bond (86% 76 + 38.24 = 900)

6 Months → Receive 40 interest (36.24 + Interest)

1 Year → Receive 40 interest

Receive 930 from sole (970 – 952.410 – 17.61) of future profit

The amount of Rs. 900 received from sale of bond act of this Rs. 900, Rs. 38.74 is invested (a) for 6 months which will become Rs. 40 after 6 months and remainign amount Rs. 861.76 is invested @ 10% for 1 year which will become Rs. 952.39. Investor will forego Rs. 40 interest receivable from the company. So, the net proceedings would be Rs. 912.39 (952.39 – 40) and the payment on futures is Rs. 905.

Profit gained over period of 1 year = 912.39 – 905

= Rs. 7.39

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6.   The share of Omega Company which is not expected to pay dividend in the near future is currently selling for ₹ 150. The risk-free rate is 0.8 per a month. A 3-month futures contract is selling for ₹ 152. Develop an arbitrage strategy and show what your profit will be 6.3 months hence.

Sol :   **(May-19)**

The formula for calculating futures contract is,

$$F_o = S_o (1 + r_f)^r$$

Given that

$S_o = 150$

$r_f = 0.8\%$

$T = 6.3$ months

Substitute the above values in F_o formula

$F_o = 150 (1 + 0.008)^{6.3}$

$= 150(1.008)^{6.3}$

$= 150 (1.0515)$

$F_o = 157.7$

Since the given future contract value is 152 which is less than the calculated futures contract value F_o i.e., 157.7 arbitrage strategy is as follows,

Action	Initial Cash Flow	Cash Flow at time T (6.3 months)
Short sell the share and return it after 6.3 months	150	$- S_T$
Now lend 150 and get back the loan amount with interest after 3.6 months	– 150	$150(1.008)^{6.3} = 157.7$
Purchase a future contract ($F_o = 152$)	0	$S_T = 152$
	0	5.7

7. **Spot price of a particular share is Rs.620 with an exercise price of call option Rs.600 with time to expiration 6 months, risk-free rate of return 12% and volatility of the share is 30%. Calculate price of the call option.**

Sol : (April-23)

The Black-Scholes formula can be used to calculate the price of a call option. The following is the formula :

$$C = SN(d1) - Ke^{(-rT)N(d2)}$$

where,

C is the price of the call option

S is the spot price of the share

K is the strike price of the call option

r is the risk-free rate return

T is the time to expiration

N(d1) and N(d2) are the cumulative normal distribution function for d1 and d2, respectively

The following are the values of d1 and d2

$$d1 = \frac{\ln\left(\frac{S}{K}\right) + \left(r + \frac{c^2}{2}\right)T}{\sigma\sqrt{T}}$$

$$d2 = d1 - \sigma\sqrt{T}$$

In your scenario, the Black-Scholes formula would utilize the following values :

S = 620

K = 600

r = 0.12

T = 0.5 (6 months in years)

σ = 0.3

We get the following pricing for the call option after plugging these variables into the formula:

$$C = 620 \times N(0.765) - 600 \times e^{(-0.12*0.5)*N(0.465)}$$

C = 49.29

5.6.1 Mechanics of Trading

Q20. Explain in detail about mechanics of trading future market ?

Ans :

The following are the mechanics of trading future market:

(i) **Clearing House**

In every deal the exchange (or) clearing house is necessarily involved as a third party. After a transaction is recorded, the clearing house substitute itself for the other party, that it becomes the seller to every buyer and buyer for every seller.

(ii) **Margin Requirement**

Trading in currency futures is subjected to specific margin and maintenance require-ment. In order to cover the risk, they are required to deposit.

(iii) **Marking to market**

In forward contract, the deals is settled on the maturity but in case of currency futures the rates are matched every day with the movements in got rates on this basis gains and losses are settled every day.

5.7 MUTUAL FUNDS

Q21. What is Mutual Funds ? Explain the features of mutual funds.

Ans :

Meaning

A mutual fund is just the connecting bridge or a financial intermediary that allows a group of investors to pool their money together with a predetermined investment objective. The mutual fund will have a fund manager who is responsible for investing the gathered money into specific securities (stocks or bonds). When you invest in a mutual fund, you are buying units or portions of the mutual fund and thus on investing becomes a shareholder or unit holder of the fund.

Features of mutual funds

The following are the features of mutual funds:

➤ **Variety**

There are four basic types of mutual funds: equity (also called stock), bond, hybrid, and money market. Equity funds concentrate their investments in stocks. Similarly, bond funds primarily invest in bonds. Hybrid funds typically invest in a combination of stocks, bonds, and other securities. Equity, bond, and hybrid funds are called long-term funds. Money market funds are referred to as short-term funds because they invest in securities that generally mature in about one year or less.

➤ **Liquidity**

Since mutual funds are required by law to redeem shares on a daily basis, fund shares are a very liquid investment. Most mutual funds also continually offer new shares to investors, and many fund companies allow shareholders to transfer money - or make "exchanges" - from one fund to another within the same fund family. Mutual funds process sales, redemptions, and exchanges as a normal part of daily business activity.

➤ **Accessibility**

Mutual fund shares are available through a variety of sources. Investors outside retirement plans may purchase fund shares either with the help of an investment professional, such as a broker, financial planner, bank representative, or insurance agent, or directly from the fund itself, based on the investor's own research and knowledge.

➤ **Affordability**

Mutual funds offer their many benefits and services at an affordable price.

Q22. What are the functions of mutual funds?

Ans :

The following are the functions of mutual funds:

➤ The basic function of mutual fund companies is buying and selling securities on behalf of its unit holders,

➤ It enables small investors to hold a share in a large and diversified portfolio of assets, which reduces the risks of investment.

➤ The savings so mobilized are pooled in a large, diversified and sound portfolio of equity, bonds, securities etc.

➤ Investors in the mutual funds are given the share in its total funds, which is evidenced by the unit certificates.

➤ Mutual funds assure professional manage-ment, which helps in earning higher rate of return.

➤ It helps the small investors who do not have adequate time and knowledge, expertise, experience and resources for directly accessing profitable avenues in capital and money markets.

Q23. State the advantages and disadvan-tages of investing in Mutual Funds.

Ans :

Advantages

➤ **Professional Management**

The basic advantage of funds is that, they are professional managed, by well qualified professional. Investors purchase funds because they do not have the time or the expertise to manage their own portfolio. A mutual fund is considered to be relatively less expensive way to make and monitor their investments.

➤ **Diversification**

Purchasing units in a mutual fund instead of buying individual stocks or bonds, the investors risk is spread out and minimized up to certain extent. The idea behind diversification is to invest in a large number of assets so that a loss in any particular investment is minimized by gains in others.

➢ **Economies of Scale**

Mutual fund buy and sell large amounts of securities at a time, thus help to reducing transaction costs, and help to bring down the average cost of the unit for their investors.

➢ **Liquidity**

Just like an individual stock, mutual fund also allows investors to liquidate their holdings as and when they want.

➢ **Simplicity**

Investments in mutual fund is considered to be easy, compare to other available instruments in the market, and the minimum investment is small.

Disadvantages

➢ **Professional Management**

Some funds doesn't perform in neither the market, as their management is not dynamic enough to explore the available opportunity in the market, thus many investors debate over whether or not the so-called professionals are any better than mutual fund or investor himself, for picking up stocks.

➢ **Costs**

The biggest source of AMC income, is generally from the entry & exit load which they charge from an investors, at the time of purchase. The mutual fund industries are thus charging extra cost under layers of jargon.

➢ **Dilution**

Because funds have small holdings across different companies, high returns from a few investments often don't make much difference on the overall return. Dilution is also the result of a successful fund getting too big. When money pours into funds that have had strong success, the manager often has trouble finding a good investment for all the new money.

5.7.1 Types of Mutual Funds Scheme

Q24. Explain about the various schemes that exist in mutual funds.

(OR)

Examine the types of mutual fund schemes.

Ans :   (April-23, May-19, Imp.)

Wide variety of Mutual Fund Schemes exists to cater to the needs such as financial position, risk tolerance and return expectations etc.

I)   By Structure

(a)   Open Ended Schemes : An open-end fund is one that is available for subscription all through the year. These do not have a fixed maturity. Investors can conveniently buy and sell units at Net Asset Value ("NAV") related prices. The key feature of open-end schemes is liquidity.

(b)   Close Ended Schemes : A closed-end fund has a stipulated maturity period which generally ranging from 3 to 15 years. The fund is open for subscription only during a specified period. Investors can invest in the scheme at the time of the initial public issue and thereafter they can buy or sell the units of the scheme on the stock exchanges where they are listed.

(c)   Interval Schemes : Interval Schemes are that scheme, which combines the features of open-ended and close-ended schemes. The units may be traded on the stock exchange or may be open for sale or redemption during pre-determined intervals at NAV related prices.

II)   By Nature

(a)   Equity fund : These funds invest a maximum part of their corpus into equities holdings. The structure of the fund may vary different for different schemes and the fund manager's outlook on different stocks. The Equity Funds are sub-classified depending upon their investment objective, as follows :

➢   Diversified Equity Funds

➢   Mid-Cap Funds

➢   Sector Specific Funds

➢   Tax Savings Funds (ELSS)

Equity investments are meant for a longer time horizon, thus Equity funds rank high on the risk-return matrix.

(b)   Debt funds : The objective of these Funds is to invest in debt papers. Government authorities, private companies, banks and financial institutions

are some of the major issuers of debt papers. By investing in debt instruments, these funds ensure low risk and provide stable income to the investors. Debt funds are further classified as :

➤ **Gilt Funds:** Invest their corpus in securities issued by Government, popularly known as Government of India debt papers. These Funds carry zero Default risk but are associated with Interest Rate risk. These schemes are safer as they invest in papers backed by Government.

➤ **Income Funds:** Invest a major portion into various debt instruments such as bonds, corporate debentures and Government securities.

➤ **MIPs:** Invests maximum of their total corpus in debt instruments while they take minimum exposure in equities. It gets benefit of both equity and debt market. These scheme ranks slightly high on the risk-return matrix when compared with other debt schemes.

➤ **Short Term Plans (STPs):** Meant for investment horizon for three to six months. These funds primarily invest in short term papers like Certificate of Deposits (CDs) and Commercial Papers (CPs). Some portion of the corpus is also invested in corporate debentures.

➤ **Liquid Funds:** Also known as Money Market Schemes, These funds provides easy liquidity and preservation of capital. These schemes invest in short-term instruments like Treasury Bills, inter-bank call money market, CPs and CDs. These funds are meant for short-term cash management of corporate houses and are meant for an investment horizon of 1 day to 3 months. These schemes rank low on risk-return matrix and are considered to be the safest amongst all categories of mutual funds.

(c) **Balanced funds:** They are a mix of both equity and debt funds. They invest in both equities and fixed income securities, which are in line with pre-defined investment objective of the scheme. These schemes aim to provide investors with the best of both the worlds. Equity part provides growth and the debt part provides stability in returns.

Further the mutual funds can be broadly classified on the basis of investment parameter viz, Each category of funds is backed by an investment philosophy, which is pre-defined in the objectives of the fund. The investor can align his own investment needs with the funds objective and invest accordingly.

III) **By Investment Objective**

(a) **Growth Schemes:** Growth Schemes are also known as equity schemes. The aim of these schemes is to provide capital appreciation over medium to long term. These schemes normally invest a major part of their fund in equities and are willing to bear short-term decline in value for possible future appreciation.

(b) **Income Schemes:** Income Schemes are also known as debt schemes. The aim of these schemes is to provide regular and steady income to investors. These schemes generally invest in fixed income securities such as bonds and corporate debentures. Capital appreciation in such schemes may be limited.

(c) **Balanced Schemes:** Balanced Schemes aim to provide both growth and income by periodically distributing a part of the income and capital gains they earn. These schemes invest in both shares and fixed income securities, in the proportion indicated in their offer documents (normally 50:50).

(d) **Money Market Schemes**: Money Market Schemes aim to provide easy liquidity, preservation of capital and moderate income. These schemes generally invest in safer, short-term instruments, such as treasury bills, certificates of deposit, commercial paper and inter-bank call money.

IV) **Other Schemes**

(a) **Tax Saving Schemes:** Tax-saving schemes offer tax rebates to the investors under tax laws prescribed from time to time. Under Sec.88 of the Income Tax Act, contributions made to any Equity Linked Savings Scheme (ELSS) are eligible for rebate.

(b) **Index Schemes:** Index schemes attempt to replicate the performance of a particular index such as the BSE Sensex or the NSE 50. The portfolio of these schemes will consist of only

those stocks that constitute the index. The percentage of each stock to the total holding will be identical to the stocks index weightage. And hence, the returns from such schemes would be more or less equivalent to those of the Index.

(c)   Sector Specific Schemes: These are the funds/schemes which invest in the securities of only those sectors or industries as specified in the offer documents. e.g. Pharmaceuticals, Software, Fast Moving Consumer Goods (FMCG), Petroleum stocks, etc. The returns in these funds are dependent on the performance of the respective sectors/industries. While these funds may give higher returns, they are more risky compared to diversified funds. Investors need to keep a watch on the performance of those sectors/industries and must exit at an appropriate time.

Q25. State the differences between closed-ended and Open-ended Schemes.

Ans :

Sl.No.	Open-ended Schemes	Sl. No.	Closed-ended Schemes
1.	Open-ended schemes accept funds from investors and sell shares to the investors on a regular basis.	1.	Closed-ended schemes offer subscriptions only for a limited period.
2.	Open-ended schemes provide the facility of withdrawing funds to the investors by following the re-purchase arrangement.	2.	Closed-ended schemes do not provide the facility of withdrawing funds to the investors as per their preference.
3.	Open-ended schemes are not listed on secondary market.	3.	Closed-ended schemes are listed on stock exchange/secondary market.
4.	In open-ended schemes of mutual fund duration is not specified for redemption.	4.	In closed-ended schemes of mutual fund duration is specified for redemption.
5.	The main feature of open-ended scheme is the liquidity.	5.	The main feature of closed-ended schemes are market forces of demand and supply.

5.7.2 Structure of Mutual Funds

Q26. Explain the Structure of Mutual Funds.

Ans :   **(Imp.)**

The SEBI Regulation Act of 1996 has defined a mutual fund as one, which is constituted in the form of a Trust under the Indian Trust Act 1882. The structure of a mutual fund consists of the following :

1.   Asset Management Company: It manages the funds of a mutual fund by diversifying the investments of a company in different type of securities. The company has to be registered with SEBI and is set up as a trust. It works under the guidelines of SEBI.

2.   Sponsor: is a person or a body corporate which establishes a mutual fund. It also appoints a Board of Trustees to manage the Trust according to the provisions provided by SEBI.

3.   Board of Trustees: This is a position of trust and confidence mainly for the benefit of the unit holders. The trustees select stock according to the price, quantity of stock and their investment policy. They operate upon the fact that the investors have limited knowledge of the environment as well as of the quality of the investments. Its management is superior to the investment in funds by a single naive investor. They are able to draw upon the special dividend as well as capital appreciation factors of a particular security. Their specialized knowledge helps them to diversify in those stocks which give the ideal combination of securities.

4.   Custodian, Bankers, Registrar and Transfer Agents are appointed by Trustees to provide financial services to the mutual funds.

5.7.3 Trends in Indian Mutual Funds

Q27. Explain in detail about mutual funds trends in India.

(OR)

Discuss the trends in Indian Mutual Funds.

Ans :   (Nov.-20, Imp.)

i)   The most important trend in the mutual fund industry is the aggressive expansion of the foreign owned mutual fund companies and the decline of the companies floated by nationalized banks and smaller private sector players.

ii)   Many nationalized banks got into the mutual fund business in the early nineties and got off to a good start due to the stock market boom prevailing then.

iii)   These banks did not really understand the mutual fund business and they just viewed it as another kind of banking activity. Few hired specialized staff and generally chose to transfer staff from the parent organizations.

iv)   The performance of most of the schemes floated by these funds was not good.

v)   Some schemes had offered guaranteed returns and their parent organizations had to bail out these AMCs by paying large amounts of money as the difference between the guaranteed and actual returns.

vi)   The service levels were also very bad. Most of these AMCs have not been able to retain staff, float new schemes etc. and it is doubtful whether, barring a few exceptions, they have serious plans of continuing the activity in a major way.

vii)   The experience of some of the AMCs floated by private sector Indian companies was also very similar. They quickly realized that the AMC business is a business, which makes money in the long term and requires deep-pocketed support in the intermediate years.

viii) Some have sold out to foreign owned companies, some have merged with others and there is general restructuring going on.

ix)   The foreign owned companies have deep pockets and have come in here with the expectation of a long haul. They can be credited with introducing many new practices such as new product innovation, sharp improvement in service standards and disclosure, usage of technology, broker education and support etc.

x)   In fact, they have forced the industry to upgrade itself and service levels of organizations like UTI have improved dramatically in the last few years in response to the competition provided by these.

Market Trends

i)   UTI with just one scheme in 1964 now competes with as many as 400 odd products and 34 players in the market. In spite of the stiff competition and losing market share, UTI still remains a formidable force to reckon with.

ii)   Last six years have been the most turbulent as well as exiting ones for the industry. New players have come in, while others have decided to close shop by either selling off or merging with others. Product innovation is now passes with the game shifting to performance delivery in fund management as well as service.

iii)   Those directly associated with the fund management industry like distributors, registrars and transfer agents, and even the regulators have become more mature and responsible.

iv)   The industry is also having a profound impact on financial markets. While UTI has always been a dominant player on the bourses as well as the debt markets, the new generation of private funds which have gained substantial mass are now seen flexing their muscles.

v)   Fund managers, by their selection criteria for stocks have forced corporate governance on the industry. By rewarding honest and transparent management with higher valuations, a system of risk-reward has been created where the corporate sector is more transparent then before.

vi)   Funds have shifted their focus to the recession free sectors like pharmaceuticals, FMCG and technology sector. Funds performances are improving.

vii) Funds collection, which averaged at less than Rs.100 bn per annum over five-year period spanning 1993-98 doubled to Rs. 210 bn in 1998-99.

viii) In the current year mobilization till now have exceeded Rs. 300 bn. Total collection for the current financial year ending March 2000 is expected to reach Rs. 450 bn.

ix) India is at the first stage of a revolution that has already peaked in the U.S. The U.S. boasts of an Asset base that is much higher than its bank deposits. In India, mutual fund assets are not even 10% of the bank deposits, but this trend is beginning to change.

5.7.4 Net Asset Value

Q28. Explain in detail about Net Asset Value.

Ans :   **(Dec.-19, Imp.)**

The question, however, is whether the performance of open-end mutual fund companies of managed funds in terms of performance is better than the performance of investments made by an individual because portfolios are equally important whether they are invested by a managed trust or by an individual. Mutual funds invest the money collected from the investors in securities markets. Market value of securities changes every day.

$$NAV = \frac{\text{Value of Securities} - \text{Liabilities}}{\text{No. of Outstanding Units}}$$

Costs in Mutual Fund Investments

Mutual funds have different kinds of expenses in order to run the business enterprise. These costs are called Operating Costs. These costs are administrative expenses, consultation fees given to trustees and expenses on brokerage. These are calculated as shown in the example below. They are also called Expense Ratio. The operating costs are deducted from the closing NAV assets. This cost is spread out on the unit holders as they receive a reduced NAV to cover the costs of the mutual funds.

$$\text{Expense Ratio} = \frac{\text{Total Annual Operating Expense}}{\text{Average Assets under Management}}$$

Return from Mutual Fund

A mutual funds investment provides a return in a form of annual dividends and distribution of capital gains. Returns are calculated by taking into consideration dividends, capital gains, NAV in the beginning of the period and NAV in the end of the period. This is shown in the example.

$$\text{Re turn} = \frac{\text{Div} + \text{CG} + (NAV_1 - NAV_0)}{NAV_0}$$

Div = Dividends.

CG = Capital gain.

NAV_0 = NAV in the beginning.

NAV_1 = NAV at the end of the year.

NAV = NAV_0 shows change over the period.

Q29. Explain about, Expense ratio, Fund of Funds.

Ans :

i)   Expense Ratio

The expense ratio (ER), also sometimes known as the management expense ratio (MER), measures how much of a fund's assets are used for administrative and other operating expenses. An expense ratio is determined by dividing a fund's operating expenses by the average dollar value of its assets under management (AUM). Operating expenses reduce the fund's assets, thereby reducing the return to investors.

The Formula for the Expense Ratio is

$$\boxed{\text{ER} = \text{Total Fund Assets} / \text{Total Fund Costs}}$$

ii)   Fund of Funds

Fund of funds is a Mutual Fund which utilizes its pool of resources to invest in various other kinds of mutual funds available in the market. Alternatively, investment in hedge funds can also be made via this Mutual Fund.

Fund of funds MFs have portfolios of varying degree of risks, depending upon the main aim of the manager. If the primary target of the portfolio manager is to earn the highest yields possible, then mutual funds having higher NAV will be targeted, even though it is associated with a higher degree of risk. However, if the primary aim is stability, low-risk instruments will be acquired using the pool of financial resources obtained.

These mutual funds can be used to invest in both in domestic as well as international funds, as per the discretion of the asset management company. This increases the diversification of the fund of funds.

The essential characteristic of such Mutual Funds is that they are maintained by highly trained professional portfolio managers. This ensures accurate market predictions to a certain extent, minimizing the chances of incurring a loss.

PROBLEMS

8.   A mutual fund collected Rs. 75,00,000 by issuing Rs. 7,50,000 units of Rs. 10 each. The amount has been invested in different securities. The market value of these securities is Rs. 1,00,00,000 and the mutual fund has a liability of 6,00,000. Calculate Net Asset Value of the fund.

Sol :

$$\boxed{\text{NAV} = \frac{\text{Value of Securities } - \text{Liabilities}}{\text{No. of Outstanding Units}}}$$

$$\text{NAV} = \frac{1,00,00,000 - 6,00,000}{7,50,000}$$

$$= \frac{94,00,000}{7,50,000}$$

9.   If the maximum sales charge is 3% on the NAV of ₹13.50. Calculate the public offering price.

Sol :

Public Offering Price (POP) is given as,

$$POP = \frac{NAV}{1 - Sales\ charge} = \frac{13.50}{1 - 0.03} = \frac{13.50}{0.97}$$

$$= ₹13.92$$

10.   A mutual fund has an NAV of Rs. 10.60 in the beginning and Rs. 10.90 at the end of the period. Calculate the return of the mutual fund.

When dividend of Rs. 150, is distributed.

If there is a capital gain also distribute of 0.50 Paisa.

Sol :

i)   Return $= \frac{1.50 + (10.90 - 10.60)}{10.60} \times 100 = \frac{1.80}{10.60} \times 100 = 16.4\%$

ii)   When capital gain is distributed $= \frac{1.50 + 0.50(10.90 - 10.60)}{10.60} \times 100 = 29.59\%.$

5.7.5 Risk and Return in Mutual Funds

Q30. Discuss briefly about risk and return involved in mutual funds.

Ans :

A)   RISK

Risk is an inherent aspect of every form of investment. For mutual fund investments, risks would include variability, or period-by-period fluctuations in total return. The value of the scheme's investments may be affected by factors affecting capital markets such as price and volume volatility in the stock markets, interest rates, currency exchange rates, foreign investment, changes in government policy, political, economic or other developments.

Types

- MARKT RISK
- LIQUIDITY RISK
- CREDIT RISK
- INTEREST RATE RISK
- INVESTMENT RISK
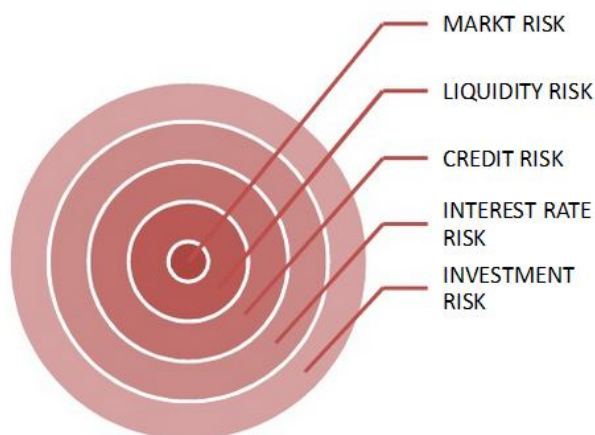
1. Market Risk

At times the prices or yields of all the securities in a particular market rise or fall due to broad outside influences. When this happens, the stock prices of both an outstanding, highly profitable company and a fledgling corporation may be affected. This change in price is due to "market risk."

2. Liquidity Risk

Thinly traded securities carry the danger of not being easily saleable at or near their real values.

The fund manager may therefore be unable to quickly sell an illiquid bond and this might affect the price of the fund unfavorably. Liquidity risk is characteristic of the Indian fixed income market.

3. Credit Risk

In short, how stable is the company or entity to which you lend your money when you invest? How certain are you that it will be able to pay the interest you are promised, or repay your principal when the investment matures?

4. Interest Rate Risk

Changing interest rates affect both equities and bonds in many ways. Bond prices are influenced by movements in the interest rates in the financial system. Generally, when interest rates rise, prices of the securities fall and when interest rates drop, the prices increase. Interest rate movements in the Indian debt markets can be volatile leading to the possibility of large price movements up or down in debt and money market securities and thereby to possibly large movements in the NAV.

5. Investment Risks

In the sectorial fund schemes, investments will be predominantly in equities of select companies in the particular sectors. Accordingly, the NAV of the schemes are linked to the equity performance of such companies and may be more volatile than a more diversified portfolio of equities.

B) Returns in Mutual Funds

The return on any investment, measured over a given period of time, is simply the sum of its capital appreciation and any income generated divided by the original amount of the investment, which is expressed as a percentage. The term applied to this composite calculation is total return.

5.8 PERFORMANCE EVALUATION MODELS

Q31. State the methods of portfolio performance evaluation.

(OR)

Briefly explain various models of performance evaluation.

Ans :   **(Dec.-18)**

Initially the performance evaluation of portfolio was done entirely by managers who were aware of the risk associated with the return, but they did not know how to quantify risk, so they could not consider it explicitly. Portfolio evaluation has evolved dramatically since the early 1960s. the various methods used for portfolio performance evaluation are :

i) Sharpe's Reward to Variability Model

Refer to Unit-V, Q.No. 32.

ii) Treynor's Reward to Volatility Model

Refer to Unit-V, Q.No. 33.

iii) Jensen's Differential Return Model

Refer to Unit-V, Q.No. 34.

5.8.1 Sharpe's Reward to Variability Model

Q32. Explain about Sharpe's Reward to Variability Model.

(OR)

Discuss Sharpe's Performance Measure.

Ans :   **(April-23)**

Sharpe's Model follows closely from the author's earlier work on the CAPM. The model yields a single value that can be used for investment performance rankings. It assigns highest rank to portfolio that has the best risk adjusted rate of return; His measure make a measurement of the risk premium of portfolios.

The difference between a portfolio's expected rate of return and the risk less rate is called the risk premium. Then each portfolio's risk premium is divided by its standard deviation of annual returns, a measure of the portfolio's total risk or variability, estimated over the evaluation period. The resulting number is the rate of reward per unit of variability. Sharpe's index is explained in the following equation :

$$S_t = \frac{r_p - r_f}{\sigma_p}$$

Where,

r_p = return on found

r_f = Risk free rate

σ_p = Standard deviation

This index gives a measure of portfolios total risk and variability of returns in relation to the risk premium. This method ranks all portfolios on the basis of S_t. If one portfolio has higher S_t than another, the first one is the better performer.

The following figure gives a graphic representation of Sharpe's index. Larger the value of S_t, the better the performance of the portfolio. S_t measure the slope of the line emanating from the risk less rate outward to the portfolio in question.

Sharpe's Index
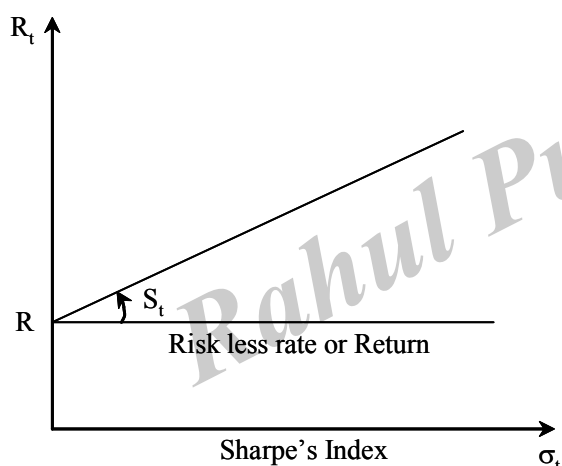
5.8.2 Treynor's Reward to Volatility Model

Q33. Explain about Treynor's Reward to Volatility Model.

Ans :

i) Jack L. Treynor based his model on the concept of characteristic line. This line is the least squares regression line relating the return to the risk and Beta is the slope of the line. The slope of the line measures volatility.

ii) A steep slope means that the actual rate of return for the portfolio in question is relatively sensitive

to fluctuations in the general stock market whereas a gentle slope indicates that the portfolio in question is relatively insensitive to market fluctuations.

iii) Treynor also pointed out that investment risk in a diversified portfolio is the sum of responses to General Market fluctuations and fluctuations peculiar to the particular securities held in the portfolio.

iv) Treynor's measure is the measure of portfolio's excess return per unit of portfolio's beta coefficients (b).

v) The Sharpe measure relates a portfolio's excess return to total risk while the Treynor measure relates the excess return to non-diversifiable or systematic risk as measured by the portfolio's volatility.

vi) However, if diversified portfolios are compared the rankings will be similar irrespective of which method is used. Treynor's reward to volatility ratio is shown in the following equation :

$$T_1 = \frac{r_t - r}{\beta_t}$$

Whereas

t_p = Treynor's measure of portfolio's performance

r_p = Return of the portfolio

r_f = Risk less rate of return

b_t = Beta coefficient or volatility of the portfolio

5.8.3 Jensen's Differential Return Model

Q34. Explain about Jensen's Differential Return Model.

Ans :

Risk adjusted performance measure has been developed by Michael Jensen and is referred to as the Jensen's measure or ratio. This ratio attempts to measure the differential between the actual return earned on a portfolio and the return expected from the portfolio given its level of risk.

185

The CAPM model is used to calculate the expected return on a portfolio. It indicates the return that a portfolio should earn for its given level of risk.

The difference between the return actually earned on a portfolio and the return expected from the portfolio is a measure of the excess return or differential return that has been earned over and above what is mandated for its level of systematic risk. The differential return gives an indication of the portfolio manager's predictive ability or managerial skills.

Using the CAPM model, the expected return of the portfolio can be calculated as follows:

$$\overline{r}_p = r_f + \beta_p(r_m - r_f)$$

Where,

$\overline{r}_p$ = The expected portfolio return

r_f = The risk free rate of return

r_m = The return on market index

β_p = The systematic risk of the portfolio.

The differential return is calculated as follows:

$$\alpha = r_f - \overline{r}_p$$

Where,

α_p = The differential return earned

r_f = The risk free rate of return

$\overline{r}_p$ = The expected return.

Thus, α_p represents the difference between actual return and expected return. If α_p has a positive value, it indicates that superior return has been earned due to superior management skills. When $\alpha_p = 0$, it indicates neutral performance.

It means that, the portfolio manager has done just as well as an unmanaged randomly selected portfolio with a buy and hold strategy.

A negative value of α_p indicates that the portfolio performance has been worse than that of the market or a randomly selected portfolio of equivalent risk.

The alpha value in Jensen measure can be tested for its degree of significance from a value of zero by statistical methods.

This means, an analysts can determine whether the differential return could have occurred by chance or whether it is significantly different from zero in a statistical sense.

5.8.4 Fama's Model

Q35.   Explain Fama's Decomposition of Returns Model.

Ans :

The Eugene Fama model is an extension of Jenson model. This model compares the performance, measured in terms of returns, of a fund with the required return commensurate with the total risk associated with it. The difference between these two is taken as a measure of the performance of the fund and is called net selectivity.

The net selectivity represents the stock selection skill of the fund manager, as it is the excess return over and above the return required to compensate for the total risk taken by the fund manager. Higher value of which indicates that fund manager has earned returns well above the return commensurate with the level of risk taken by him.

Required return can be calculated as:

$$Ri = Rf + Si/Sm*(Rm - Rf)$$

Where, Sm is standard deviation of market returns. The net selectivity is then calculated by subtracting this required return from the actual return of the fund.

Q36.   Why does performance evaluation require an appropriate bench mark to be meaningful?

Ans :   (Aug.-21)

Performance benchmarks establish estimated data processing efficiencies and effectiveness of design mechanisms within the boundary of the structural design. Performance benchmarks establish the design goals for structural elements against which software implementation can be evaluated. Performance benchmarks are derived from the structural specifications accounting for the distribution of data processing functionality among structural units and components identified within the bottom tier of the structural configuration.

It is necessary to establish the performance benchmarks for the bottom-tier structural elements since they represent the building block that will be implemented (designed, coded, and tested) against the structural specifications. The performance benchmarks must establish the performance requirements to be specified for the lower-tier structural units and components.

The performance of the integrated software product is a result of the sequential integration of the structural elements, through several levels of integration. Software performance engineering must account for the effect of any encumbrance the assimilation burden may have at the integrated component or product levels. The progressive assimilation through the levels of integration must be accounted for to establish accurate structural element performance specifications.

Q37.   What do you understand by Systematic Investment Plan (SIP)? How does it benefit investors?

Ans :   (Aug.-21)

Meaning

Systematic Investment Plan or SIP is a method of investing in mutual funds wherein an investor chooses a mutual fund scheme and invests the fixed amount of his choice at fixed intervals.

SIP investment plan is about investing a small amount over time rather than investing one-time huge amount resulting in a higher return.

Benefits

Here are some of the key benefits of SIPs:

1.   Rupee Cost Averaging

Rupee Cost Averaging is a term inspired by the approach of Dollar Cost Averaging or DCA. This approach was introduced to us by Benjamin Graham, in his book, The Intelligent Investor. Rupee Cost Averaging allows you to invest small amounts regularly, which helps you average out the cost of your investment over time.

2.   Investment Discipline

SIPs encourage a disciplined approach to invest by requiring you to set aside a fixed amount of money on a monthly basis. This helps you build a disciplined habit of saving and investing, which is critical for long-term financial success. Investing discipline also enables you to reap the benefits of wealth-compounding over decades better than the benefits you would get through lump sum investing.

3.   Convenience

SIPs are easy to set up and manage. Moreover, the mandate allows the investment amount to be automatically deducted from your bank account each month. This makes SIPs a convenient option for individuals who are busy or who don't have the time to manage their investments actively.

4.   Flexibility

SIPs offer you the flexibility to choose the amount you want to invest, the frequency of investment, and the duration of the investment. This allows individuals to tailor their investments to meet their specific financial goals and needs. In India, you can start a SIP with as low as ?500 a month.

5.   Cost-effective

Investing through SIPs is cost-effective, as the investment amount is small and the investment management fees are spread over a longer period, reducing the impact of fees on overall returns.

6.   Professional management

Mutual funds are managed by trained professionals with several years of industry experience. SIPs provide access to professional investment management, which can help individuals make informed investment decisions and achieve their financial goals.

7.   Long-term benefits

SIPs are a great option for long-term investment, as they allow individuals to invest regularly over an extended period of time, taking advantage of the power of compounding. This means that the returns on your investments are reinvested, resulting in exponential growth over time.

SOLVED PROBLEMS

11. **From the following data, Calculate Sharpe's Index and Interpret the result:**

Portfolio X: Expected Return Rp = 15%, σp = 5%

Portfolio Y: Expected Return Rp = 20%; σp = 6%

Risk-free Rate of Return (Rf) = 10%

Sol :   (Dec.-19)

Sharp's Index

$$S_t = \frac{r_p - r_f}{\sigma_p}$$

Where,

r_p = return on found

r_f = Risk free rate

σ_p = Standard deviation

i) **Portfolio X**

$$S_t = \frac{r_p - r_f}{\sigma_p}$$

Where,

r_p = 15

r_f = 10

σ_p = 5

$$= \frac{15 - 10}{5}$$

S_t = 1

ii) **Portfolio Y**

$$S_t = \frac{r_p - r_f}{\sigma_p}$$

r_p = 20

r_f = 10

σ_p = 6

$$= \frac{20 - 10}{6}$$

S_t = 1.67

Comment

Portfolio Y stood in first place as it has higher index than Portfolio X.

12. **Given the following information.**

	Portfolio A	Portfolio B
Beta	0.9	1.8
Return (%)	12.5	19
SD (%)	20	26.5

Risk free rate of return 6% Market return = 12%

Calculate

(i) **Sharpe Ratio**

(ii) **Treynor Ratio**

Sol :   (May-19)

(i) **Sharpe Ratio**

The formula for calculating sharpe ratio is,

$$S_F = \frac{r_p - r_f}{\sigma_p}$$

Portfolio A

Given values for portfolio A are,

r_p = 12.5%

r_f = 6%

σ_p = 20%

Substitute the above values in the sharpe ratio formula.

$$S_p = \frac{12.5 - 6}{20}$$

$$= \frac{6.5}{20}$$

$$= 0.325$$

Portfolio B

Given values for portfolio B are

r_p = 19%

r_f = 6%

σ_p = 26.5%

Substitute the above values in the Treynor ratio formula

$$S_p = \frac{r_p - r_f}{\sigma_p} = \frac{19 - 6}{26.5} = \frac{13}{26.5}$$

$$S_p = 0.49$$

(ii) Treynor Ratio

The formula for calculating Treynor ration is,

$$T_p = \frac{r_p - r_f}{\beta_p}$$

Portfolio A

Given values for portfolio A are,

$r_p = 12.5\%$

$r_f = 6\%$

$\beta_p = 0.9$

Substitute the given values in Treynor ratio formula,

$$T_p = \frac{12.5}{0.9} = \frac{6.5}{0.9}$$

$$T_p = 7.22$$

Portfolio B

Given values for portfolio B are,

$r_p = 19\%$

$r_f = 6\%$

$\beta_p = 1.8\%$

Substitute the above values in the Treynor ratio formula.

$$T_p = \frac{19 - 6}{1.8} = \frac{13}{1.8}$$

$$T_p = 7.22$$

13.

Portfolio	Average Annual Return	Standard Deviation	Correlation Co-efficient
A	18	27	0.8
B	14	18	0.6
C	15	8	0.9
Market	13	12	–

Risk free rate of interest is 9.

(a) **Rank these portfolio using Sharpe's and Treynor's methods.**

(b) **Compare both the indices.**

Sol :

(a) Sharpe Index

$$S_t = \frac{r_p - r_f}{\sigma_p}$$

Where,

r_p = return on found

r_f = Risk free rate

σ_p = Standard deviation

$$A = \frac{18 - 9}{27} = .333$$

$$B = \frac{14 - 9}{18} = .277$$

$$C = \frac{15 - 9}{8} = .75$$

Conclusion :

Ranking order is C, A, P

Treynor Index

$$T_p = \frac{r_p - r_f}{\beta_p}$$

Beta values are not given. Beta values can be estimated by using the formula

$$\beta = r \, \frac{\sigma_p}{\sigma_m}$$

$$A = 0.8 \times \frac{27}{12} = 1.8$$

$$B = 0.6 \times \frac{18}{12} = .6$$

$$C = 0.9 \times \frac{8}{12} = .6$$

$$T_n \text{ for } A = \frac{18 - 9}{1.8} = 5$$

$$T_n \text{ for } B = \frac{14 - 9}{.9} = 5.56$$

$$T_n \text{ for } C = \frac{15 - 9}{.6} = 10.$$

Conclusion

The ranking is C, B, A.

(b) The order of B and A get reversed in the Treynor's index. This may be due to their relationship with the market i.e., the systematic risk factor.

14.   **Mr. Anand is having units in a mutual fund for the past three years. He wants to evaluate its performance by comparing it to the market.**

	Fund	Market
Return	70.60	41.40
Standard deviation	41.31	19.44
Risk Free Rate	2%	2
β	1.12	–

Find out Sharpe and Treynor indices. Comment

Sol :

(a)   Sharpe Index

i)   Fund $S_t = \dfrac{r_p - r_f}{\sigma_p}$

$= \dfrac{70.60 - 12}{41.31}$

$= 1.419$

ii)   Market $= \dfrac{r_p - r_f}{\sigma_m}$

$= \dfrac{41.40 - 12}{19.44}$

$= 1.512$

Conclusion :

Sharpe index for the fund is lower than the market and it indicates that the fund has not performed well.

(b)   Treynor's Index

$T_n = \dfrac{r_p - r_f}{\beta_p}$

i)   Fund $= \dfrac{70.60 - 12}{1.12} = 52.3\%$

ii)   Market $= \dfrac{41.40 - 12}{1} = 29.4$

Conclusion :

(Market index by definition would have a beta value equal to 1. According to Treynor index, the portfolio has performed better than the market. The two measures give different opinions. Reason is that the Sharpe's measure uses the total risk and the Treynors measure uses only the systematic risk. In a well-diversified portfolio, the unsystematic risk would become zero and both the measures would give the same result. But, here the portfolio seems to be poorly diversified and so, the results differ.

15. Six portfolios experienced the following results during a seven year period :

Portfolio	Average Annual Return (%)	Standard Deviation (%)	Correlation with Market
A	18.6	27.0	0.81
B	14.8	18.0	0.65
C	15.1	8.0	0.98
D	22.0	21.2	0.75
E	– 9.0	4.0	0.45
F	26.5	19.3	0.63
Market (m)	13.0	12.0	–
Risk Free Rate (R_f)	9.0	––	

Rank these portfolios using Sharpes and Treynor's methods.

Sol :

Portfolio	Average Annual return (%)	Std. Deviation	Correlation with Market
A	18.6	27	0.81
B	14.8	18	0.65
C	15.1	8	0.98
D	22.0	21.2	0.75
E	–9	4	0.45
F	26.5	19.3	0.63
Market (m)	13	12	–
Risk free rate (R_f)	9	–	–

i) Sharpe measure

$$S_p = \frac{r_p - r_f}{\sigma_p}$$

$$S_A = \frac{18.6 - 9}{27} = 0.36$$

$$S_B = \frac{14.8 - 9}{18} = 0.32$$

$$S_C = \frac{15.1 - 9}{8} = 0.76$$

$$S_D = \frac{22 - 9}{21.2} = 0.61$$

$$S_E = \frac{-9 - 9}{4} = -4.5$$

$$S_F = \frac{26.5 - 9}{19.3} = 0.91$$

ii)   Treynor measure

$$T_P = \frac{r_p - r_f}{\beta_p}$$

In the given problem 'β' values are not given, β can be calculated by using the formula :

$$\beta_p = \rho = \frac{\sigma_p}{\sigma_m}$$

$$\beta_A = 0.81 \times \frac{27}{12} = 1.82$$

$$\beta_B = 0.65 \times \frac{18}{12} = 0.975$$

$$\beta_C = 0.98 \times \frac{8}{12} = 0.653$$

$$\beta_D = 0.75 \times \frac{21.2}{12} = 1.325$$

$$\beta_E = 0.45 \times \frac{4}{12} = 0.15$$

$$\beta_E = 0.63 \times \frac{19.3}{12} = 1.013$$

$$T_A = \frac{18.6 - 9}{1.82} = 5.275$$

$$T_B = \frac{14.8 - 9}{0.975} = 5.95$$

$$T_C = \frac{15.1 - 9}{0.653} = 9.34$$

$$T_D = \frac{22 - 9}{1.325} = 9.81$$

$$T_E = \frac{-9 - 9}{0.15} = -120$$

$$T_F = \frac{26.5 - 9}{1.013} = 17.273$$

Conclusion :

Ranking the funds using sharpe and Treynor measures :

Fund	Sharpe	Rank	Treynor measure	Rank
A	0.36	4	5.275	5
B	0.32	5	5.95	4
C	0.76	2	9.34	3
D	0.61	3	9.81	2
E	– 4.5	6	–120	6
F	0.91	1	17.275	1

16. **Pearl and Diamond are the two funds, Pearl has a mean success of 0.15 and Diamond has 0.22. The Diamond has double the beta of Pearl fund's 1.5. The standard deviations of Pearl and Diamond funds 15% and 21.43%. The mean return of market index is 12% and its standard deviations is 7. The risk-free rate is 8%.**

   (a) **Compute the Jensen Index for each fund.**

   (b) **Compute the Treynor and Sharpe indices for the funds. Interpret the results.**

Sol :

1. **Jensen Index**

   $$R_P = \alpha_p + \beta(R_m - R_f)$$

   Jensen's Index for Pearl Fund

   $$= 8 + 1.5 (12 - 8)$$
   $$= 14$$

   For Diamond fund,

   $$= 8 + 3 (12 - 8)$$
   $$= 20$$

   The difference between the actual and estimated returns.

   Pearl fund = 15 – 4 = 1

   Diamond fund = 22 – 20 = 2

2. **Treynor Index**

   $$T_n = \frac{r_p - r_f}{\beta_p}$$

   Pearl fund $= \dfrac{15 - 8}{1.5} = 0.47$

   Diamond fund $= \dfrac{22 - 8}{3} = 4.67$

   According to Treynor Index, both the funds have same value.

3. **Sharpe Index**

   $$S_t = \frac{r_p - r_f}{\sigma_p}$$

$$\text{Pearl fund} = \frac{15 - 8}{15} = 0.46$$

$$\text{Diamond fund} = \frac{22 - 8}{21.43} = 0.65$$

$$\text{Market performance} = \frac{12 - 8}{7} = 0.57$$

Treynor index and the Sharpe index results differ. Sharpe index considers the total risk but the Treynor index considers only the market risk.

17. Six portfolios experienced the following results during a seven year period :

Portfolio	Average Annual Return (%)	Standard Deviation (%)	Correlation with Market
A	18.6	27.0	0.81
B	14.8	18.0	0.65
C	15.1	8.0	0.98
D	22.0	21.2	0.75
E	– 9.0	4.0	0.45
F	26.5	19.3	0.63
Market	13.0	12.0	–
Risk Free Rate	9.0	–	–

Sol :

Portfolio	Average Annual return (%)	Std. deviation	Correlation with Market
A	18.6	27	0.81
B	14.8	18	0.65
C	15.1	8	0.98
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E	–9	4	0.45
F26.5	19.3	0.63	
Market	13	12	–
Risk free rate	9	–	–

1. Sharpe measure :

$$S_p = \frac{r_p - r_f}{\sigma_p}$$

$$S_A = \frac{18.6 - 9}{27} = 0.36$$

$$S_B = \frac{14.8 - 9}{18} = 0.32$$

$$S_C = \frac{15.1 - 9}{8} = 0.76$$

$$S_D = \frac{22 - 9}{21.2} = 0.61$$

$$S_E = \frac{-9 - 9}{4} = -4.5$$

$$S_F = \frac{26.5 - 9}{19.3} = 0.91$$

2. Treynor measure

$$T_P = \frac{r_p - r_f}{\beta_p}$$

In the given problem 'β' values are not given, β can be calculated by using the formula :

$$\beta = P \times \frac{\sigma_p}{\sigma_m}$$

$$\beta_A = 0.81 \times \frac{27}{12} = 1.82$$

$$\beta_B = 0.65 \times \frac{18}{12} = 0.975$$

$$\beta_C = 0.98 \times \frac{8}{12} = 0.653$$

$$\beta_D = 0.75 \times \frac{21.2}{12} = 1.325$$

$$\beta_E = 0.45 \times \frac{4}{12} = 0.15$$

$$\beta_E = 0.63 \times \frac{19.3}{12} = 1.013$$

$$T_A = \frac{18.6 - 9}{1.82} = 5.275$$

$$T_B = \frac{14.8 - 9}{0.975} = 5.95$$

$$T_C = \frac{15.1 - 9}{0.653} = 9.34$$

$$T_D = \frac{22 - 9}{1.325} = 9.81$$

$$T_E = \frac{-9 - 9}{0.15} = -120$$

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18. **Pearl and Diamond are the two mutual funds. Pearl has a mean success of .15 and Diamond has .22. The Diamond has double the beta of Pearl fund's 1.5. The standard deviations of Pearl and Diamond funds are 15% and 21.43%. The mean return of market index is 12% and its standard deviation is 7. The risk free rate is 8%.**

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Sol :

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The difference between the actual and estimated returns.

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Sharpe Index

$$S_t = \frac{r_p - r_f}{\sigma_p}$$

Pearl fund $= \dfrac{15 - 8}{15} = 0.46$

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Market performance $= \dfrac{12 - 8}{7} = 0.57$

Conclusion

Treynor index and the Sharpe index results differ. Sharpe index considers the total risk but the Treynors index considers only the market risk.

5.8.5 Fama's Decomposition of Returns

Q38. Describe Fama's decomposition approach.

Ans :

i) The performance measures assess the overall performance of a portfolio or fund. Eugene Fama has provided an analytical framework that allows a detailed breakdown of a funds performance into the source or components performance. This is known as the Fama decomposition of total return.

ii) The total return on a portfolio can be firstly divided into two components namely, risk free return and the excess return. Thus,

> Total return = Risk free return + Excess return

iii) The excess return arises from different factors or sources such as risk bearing and stock selection.

iv) Hence, the excess return, in turn, may be decomposed into two components, namely, risk premium or reward for bearing risk and return from stock selection known as return from stock selectively. Thus,

> Excess return = Risk premium + Return from stock selection

v) The risk of a security is of two types, systematic risk and unsystematic risk or diversifiable risk. When a portfolio of securities is created most of the unsystematic risk or diversifiable risk would disappear. But in practice, there is no portfolio systematic risk and a small amount of diversifiable risk.

vi) Hence, the risk premium can be decomposed into two components namely, return from bearing systematic risk (market risk) and return for bearing diversifiable risk. Thus,

> Risk premium = Return for bearing systematic risk + Return for bearing diversifiable risk

Thus, the total return on a portfolio can be decomposed into four components.

> Return on portfolio = Riskless rate + Return from market risk + Return from diversifiable risk + Return from pure selectivity

This may be represented as,

$$R_P = R_f + R_1 + R_2 + R_3$$

Each components can be calculated as follows.

i)   The risk-free rate of return (R_f) is the return available on a riskless asset such as the government security.

ii)   The return from market risk (R_1) is calculated as,

$$R_1 = \beta_p(R_m - R_f)$$

Where,

R_m = The return on the market index

iii)   The return from diversifiable risk (r_2) is calculated as,

$$R_2 = \left[\left(\frac{\sigma_p}{\sigma_m}\right) - \beta_p\right](r_m - r_f)$$

Where,

σ_p = The portfolio standard deviation

αm = The standard deviation of the market index.

iv)   The return from pure selectivity (R_3) can be obtained as the difference between the actual return and the sum of the other three components as,

$$R_2 = R_p - (R_f + R_1 + R_2)$$

The return from pure selectivity is really the additional return obtained by a portfolio manager for his superior stock selection ability. It is the return earned over and above the return mandated by the total risk of the portfolio as measured by standard deviation.

Mathematically, this can be calculated as the difference between the actual return on a portfolio and the return mandated by its total risk.

PROBLEMS

19.   Consider the following data on a portfolio,

$R_p = 21\%$, $a_p = 15\%$, $R_m = 16\%$,

$\sigma_m = 12\%$, $r_1 = 10\%$, $\beta_p = 0.85$

Compute the Fama's net selectivity.

Sol :

Fama's decomposition may be stated as,

$$R_p = R_f + R_1 + R_2 + R_3$$

Here,

R = 10%

R_1 = Return from market

R_2 = Return from diversifiable risk

R_3 = Return from pure selectivity

We have,

$$R_1 = \beta_p(R_m - R_f)$$

$$= 0.85(16 - 10) = 5.1\%$$

$$R_2 = \left[\left(\frac{\sigma_p}{\sigma_m}\right) - \beta_p\right](R_m - R_f)$$

$$= \left[\left(\frac{15}{12}\right) - 0.85\right](16 - 10)$$

$$= (1.25 - 0.85)(6) = 2.4\%$$

$$R_3 = R_p - (R_f + R_1 + R_2)$$
$$= 21 - (10 + 5.1 + 2.4)$$
$$= 3.5\%$$

Thus

$$R_p = 10 + 5.1 + 2.4 + 3.5 = 21\%$$

Alternatively, Fama's net selectivity can be direct calculated as follows.

Fama's net selectivity

$$= R_p - \left[R_f\left(\frac{\sigma_p}{\sigma_m}\right)(R_m - R_f)\right]$$

$$= 21 - \left[10 + \left(\frac{15}{12}\right)(16 - 10)\right]$$

$$= 21 - (10 + 7.5)$$
$$= 21 - 17.5 = 3.5\%$$

20. **Mr. Ajay has been managing the portfolio of a large mutual fund for the last two years. He found that his portfolio had earned a return of 70.6%, the standard deviation of returns was 41.31% and had a beta of 1.121. During the same period, the return on the market as a whole was 41.4% and had the standard deviation of 19.44%. Assume that the risk-free rate was 12%. Compute the Fama's measure of net selectivity for Ajay's performance and show the breakup of its observed return in terms of its various components.**

Sol :

Given that,

$$R_p = 70.60\%, \quad R = 41.40\%$$

$$\sigma_p = 41.31\%, \quad \sigma_m = 19.44\%$$

Fama's net selectivity

$$= R_p - \left[R_f + \left(\frac{\sigma_p}{\sigma_m}\right)(R_m - R_f)\right]$$

$$= 70.60 - \left[12 + \left(\frac{41.31}{19.44}\right)(41.4 - 12)\right]$$

$$= 70.60 - [12 + (2.125 \times 29.4)]$$

$$= 70.60 - [12 + 62.475]$$

$$= 70.60 - 74.475 = -3.875\%$$

Breakup of observed return in terms of its various components is given below,

1. Risk free return, $R_f = 12.00\%$

2. Compensation for systematic risk,

    $R_1 = (R_m - R_f) = 1.121\ (41.4 - 12) = 32.96\%$

3. Compensation for diversifiable risk,

    $$R_2 = \left[\left(\frac{\sigma_p}{\sigma_m}\right) - \beta_p\right](R_m - R_f)$$

    $$= \left[\frac{41.31}{19.44} - 1.121\right](41.4 - 12)$$

    $$= (2.125 - 1.121)\ (29.4)$$

    $$= 1.004 \times 29.4 = 29.52\%$$

4. Net selectivity, $R_3 = -3.88\%$

    Total actual return,

    $$R_p = R_f + R_1 + R_2 + R_3$$
    $$= 12 + 32.96 + 29.52 - 3.88$$
    $$= 70.60\%.$$

Short Question and Answers

1.   Derivatives

Ans :

A derivative is a financial instrument whose value depends on underlying assets. The underlying assets could be prices of traded securities of gold, copper, aluminum and may even cover prices of fruits and flowers.

Derivatives have become important in India since 1995, with the amendment of the Securities Contract Regulation Act of 1956. Derivatives such as options and futures are traded actively on many exchanges. Forward contracts, swap and different types of options are regularly traded outside exchanges by financial institutions, banks and corporate client in over-the-counter markets. There is no single market place or an organized exchange.

2.   Features of Options

Ans :

The following features are common in all types of options.

➢   **Contract:** Option is an agreement to buy or sell an asset obligatory on the parties.

➢   **Premium:** In case of option a premium in cash is to be paid by one party (buyer) to the other party (seller).

➢   **Pay off:** From an option in case of buyer is the loss in option price and the maximum profit a seller can have in the options price.

➢   **Holder and writer** Holder of an option is the buyer while the writer is known as seller of the option. The writer grants the holder a right to buy or sell a particular underlying asset in exchange for a certain money for the obligation taken by him in the option contract.

3.   Types of options.

Ans :

There are various types of options depending upon the time, nature and exchange of trading. The following is a brief description of different types of options:

(i)   Put option is an option which confers the buyer the right to sell an underlying asset against another underlying at a specified time on or before a predetermined date.

(ii)   Call option is an option which grants the buyer (holder) the right to buy an underlying asset at a specific date from the writer (seller) a particular quantity of underlying asset on a specified price within a specified expiration/maturity date.

4.   The Black-scholes Pricing Model (BSOPM)

Ans :

The black and scholes option pricing model is the most commonly used option pricing model in finance. It was initially developed in 1973 by two academicians fisher Black and Myron scholes and was designed to price European option on non dividend paying stocks after that they developed consultancy org to do many recommendation at corporate sector. Later on some adjustment are made regarding - payment of dividend income. This model is also applicable for American option now days most of the option are made on American style (or) option.

5.   Mutual Funds

Ans :

A mutual fund is just the connecting bridge or a financial intermediary that allows a group of investors to pool their money together with a predetermined investment objective. The mutual fund will have a fund manager who is responsible for investing the gathered money into specific securities (stocks or bonds). When you invest in a mutual fund, you are buying units or portions of the mutual fund and thus on investing becomes a shareholder or unit holder of the fund.

6.   Functions of mutual funds

Ans :

➢   The basic function of mutual fund companies is buying and selling securities on behalf of its unit holders,

➢   It enables small investors to hold a share in a large and diversified portfolio of assets, which reduces the risks of investment.

➢   The savings so mobilized are pooled in a large, diversified and sound portfolio of equity, bonds, securities etc.

7.   Open-ended and Closed-ended Schemes

Ans :

Sl.No.	Open-ended Schemes	Sl.No.	Closed-ended Schemes
1.	Open-ended schemes accept funds from investors and sell shares to the investors on a regular basis.	1.	Closed-ended schemes offer subscriptions only for a limited period.
2.	Open-ended schemes provide the facility of with-drawing funds to the investors by following the re-purchase arrangement.	2.	Closed-ended schemes do not provide the facility of withdrawing funds to the investors as per their preference.
3.	Open-ended schemes are not listed on secondary market.	3.	Closed-ended schemes are listed on stock exchange/secondary market.
4.	In open-ended schemes of mutual fund duration is not specified for redemption.	4.	In closed-ended schemes of mutual fund duration is specified for redemption.
5.	The main feature of open-ended scheme is the liquidity.	5.	The main feature of closed-ended schemes are market forces of demand and supply.

8.   Net Asset Value

Ans :

The question, however, is whether the performance of open-end mutual fund companies of managed funds in terms of performance is better than the performance of investments made by an individual because portfolios are equally important whether they are invested by a managed trust or by an individual. Mutual funds invest the money collected from the investors in securities markets. Market value of securities changes every day. This is the reason that NAV also varies from day to day. The NAV per unit is the market value of securities of a scheme divided by the total number of units of the scheme on any particular day. NAV can be calculated in the following way:

$$NAV = \frac{\text{Value of Securities - Liabilities}}{\text{No. of Outstanding Units}}$$

9.   Covered call and straddle

Ans :

A covered call refers to a financial transaction in which the investor selling call options owns an equivalent amount of the underlying security. To execute this an investor holding a long position in an asset then writes (sells) call options on that same asset to generate an income stream. The investor's long position in the asset is the "cover" because it means the seller can deliver the shares if the buyer of the call option chooses to exercise. If the investor simultaneously buys stock and writes call options against that stock position, it is known as a "buy-write" transaction

A straddle is a neutral options strategy that involves simultaneously buying both a put option and a call option for the underlying security with the same strike price and the same expiration date.

A trader will profit from a long straddle when the price of the security rises or falls from the strike price by an amount more than the total cost of the premium paid. Profit potential is virtually unlimited, so long as the price of the underlying security moves very sharply.

10.   Explain Protective Put and Covered Call.

Ans :

Protective Put

Protective put is one of the option strategy that is used to hedge in a bear market. Protective put is the strategy which an investor buys both stock and put.

Covered Call

Covered call is one of the option strategy that is used to hedge the risk through purchasing stock by writing the call options. Under this strategy, one should maintain a suitable hedge ratio and also high number of written calls than stock. Most preferred simple strategy is to buy a stock for writing one call of their own is called covered call. This strategy is less risky when compared to other strategies.

Exercise Problems

1. Nithya firm is trying to decide two out of the four investment funds. From the past performance, they were able to calculate the following average returns and standard deviations of these funds. The current risk free rate of interest is 9 percent

	Alpha	Veenu fund fund	Meenu fund	Arvind fund
Average return	17	18	16	14
Standard deviation	19	20	13	12

[Ans : [Sharp's Index, S_{Alpha} = 0.421, S_{veenu} = 0.45, S_{Meenu} = 0.538, S_{Arvind} = 0.417]]

2. An investor holds units in 3 mutual funds (X, Y and Z). The risk free rate of return is 9%. Find the missing figures in the table

Fund	Sharpe's Measure	Standard Deviation	Return on Fund
X	?	41.30	71
Y	0.43	?	17
Z	0.54	13	?

[Ans: S_X = 1.5 (III), σ_Y = 18.60 (I) r_Z = 16.02 (II)]

3. The rate of return and risk for three growth - oriented firms are as follows

Growth Firms	Return	Risk(s)
A	15 %	16%
B	13 %	18%
C	12 %	11%

Rank each form by Sharpe's index of portfolio performance if the risk free rate is 7 percent

[Ans: Sharpe Index = [S_A = 0.5, S_B = 0.33, S_C = 0.43]]

4. Mr. Anand is having units in a mutual fund for the past three years. He wants to evaluate its performance by comparing it to the market.

	Fund	Market
Return	70.60	41.40
Standard deviation	41.31	19.44
Risk free rate	2%	2
β	1.12	–

Rank each form by Sharpe's Treynor's index of portfolio performance if the risk free rate is 7 percent

[Ans: [S_t = 2.03%, Trevnor's T_n = 61.23]

5. Consider the following information for three mutual funds P, Q and R and the market.

	Mean return	Standard Deviation	Beta
P	15%	20%	0.90
Q	17%	24%	1.10
R	19%	27%	1.20
Market Index	16%	20%	1.00

The mean risk-free rate was 10 percent. Calculate the Treynor measure, Sharpe measure and a Jensen measure for the three mutual funds and the market index.

[Ans : [S_P = 0.25, 0.292, 0.33 ; T_P = 5.56, 6.36, 7.5]

Sharpe's Index – S_P = 0.25, S_Q = 0.292, S_R = 0.33

Treynor's Index → T_P = 5.56, T_Q = 6.36, T_R = 7.5]

6. Consider the following information for three mutual funds P, Q and R and the market. Mean Standard Beta return deviation

P	15%	20%	0.90
Q	17%	24%	1.10
R	19%	27%	1.20
Market Index	16%	20%	1.00

The mean risk-free rate was 10 percent. Calculate the Treynor measure, Sharpe measure and Jensen measure for the three mutual funds and the market index.

[Ans: Treynor's measure (t_n) ⇒ 5.56, 6.36, 7.5

Market Index ⇒ 6.00

Sharpe Measure (S_P) = 0.25, 0.292, 0.333

Market Index = 0.3

Iensen Measure = 0.4, 6.4, 1.8

Market Index = 0]

7. Consider the following information for three mutual funds and the market.

	Mean return	Standard deviation	Beta
SBIMF	15 percent	20 percent	.9
BOIMF	17 percent	24 percent	1.10
TATAMF	19 percent	27 percent	1.20
Market Index	16 percent	20 percent	

The mean risk-free rate was 10 percent. Calculate the Jensen measure and Treynor measure for the three mutual funds.

[Ans : Iensen Measure → – 0.44 (III), 0.36 (II), 1.5 (I)

Treynor Measure → 5.56 (III), 6.36 (II), 7.5 (I)]

Choose the Correct Answers

1.   The mutual funds that are listed in the stock exchanges are _____.   [a]

     (a)   closed-end funds   (b)   stock indexed funds

     (c)   open-end funds   (d)   growth schemes

2.   The investors by investing in the mutual funds get _____.   [d]

     (a)   professional management   (b)   diversification

     (c)   return potential   (d)   all the above

3.   The Sharpe index assigns the high value to funds that have _____.   [c]

     (a)   low standard deviations   (b)   higher returns

     (c)   higher risk adjusted returns   (d)   higher risk premium

4.   According to Treynor index, a steep slope would indicate _____.   [c]

     (a)   the fund is yielding higher returns   (b)   the fund's volatile return

     (c)   the fund is sensitive to the market   (d)   the fund is not sensitive to the market

5.   In the Treynor index, the performance of the fund depends on the _____.   [c]

     (a)   riskless rate of return

     (b)   risk premium and standard deviation of funds return

     (c)   risk premium and beta coefficient

     (d)   risk premium and the standard deviation

6.   Jensen's performance index gives importance _____.
     [d]

     (a)   to the asset combination   (b)   professional management

     (c)   the market condition   (d)   the predictive ability of the manager

7.   Put option gives the owner the right to _____.
     [d]

     (a)   buy an underlying asset or security

     (b)   sell an underlying asset or security

     (c)   buy an underlying asset or security but not an obligation

     (d)   sell an underlying asset or security but not an obligation

8.   The call option price is higher when the _____.
     [d]

     (a)   strike price is higher than the stock price

     (b)   strike price is lower than the stock price

     (c)   option period is shorter

     (d)   option period is longer and the strike price is lower

9.   The option is at the money when _____.   [c]

     (a)   stock price > strike price   (b)   strike price > stock price

     (c)   stock price = strike price   (d)   there is a high premium

10. Which one of the following statement is true   [d]

     (a)   the premium of the call option and the stock price are inversely related

     (b)   option prices are not affected by the dividends

     (c)   stock market volatility does not affect the option price

     (d)   the premium of the call option is directly related to stock price

Fill in the Blanks

1.   A _____ is a financial instrument whose value depends on underlying assets.

2.   Leaps stands for _____.

3.   _____ strategies are plans implemented by an options trader to maximize profits and minimize risk.

4.   A long call is simply the purchase of _____ call option.

5.   The Binomial Option Pricing Model is an options valuation method developed by _____.

6.   A _____ contract is an agreement between two parties to buy or sell an asset at a certain time in future, at a certain price.

7.   _____ are the oldest of all derivatives.

8.   _____ contracts are normally traded outside stock exchanges.

9.   _____ is an inherent aspect of every form of investment.

10.   AUM stads for _____

ANSWERS

1.   Derivative

2.   Long Term Equity Anticipation Securities.

3.   Option

4.   One

5.   Cox in 1979

6.   Future

7.   Forwards

8.   Forward

9.   Risk

10.   Assets Under Management

Very Short Questions and Answers

1.   **Sharpe's Reward to Variability Model**

Ans :

    Sharpe's Model follows closely from the author's earlier work on the CAPM. The model yields a single value that can be used for investment performance rankings.

2.   **Treynor's Reward to Volatility Model**

Ans :

    Jack L. Treynor based his model on the concept of characteristic line. This line is the least squares regression line relating the return to the risk and Beta is the slope of the line.

3.   **Speculators**

Ans :

    A speculator is a person who is willing to take a risk by taking futures position with the expectation to earn profits. Speculator aims to profit from price fluctuations.

4.   **Arbitrageurs**

Ans :

    Arbitrageurs are another important group of participants in futures markets. They take advantage of price differential of two markets. An arbitrageur is a trader who attempts to make profits by locking in a riskless trading by simultaneously entering into transactions in two or more markets. In other words, an arbitrageur tries to earn riskless profits from discrebancies between futures and spot prices and among different futures prices.

5.   **Over The Counter Trading (OTC)**

Ans :

    Forward contracts are private contracts hence traded over the counter and not in exchanges. The contract can be modified as per the requirements of parties.

Internal Assessment (Mid Examinations)

In CIE, for theory subjects, during a semester, there shall be two mid-term examinations. Each MidTerm examination consists of two parts i) Part – A for 10 marks, ii) Part – B for 20 marks with a total duration of 2 hours as follows:

1. Mid-Term Examination for 30 marks:

   (a) Part - A: Objective/quiz paper/Short Note questions for 10 marks.

   (b) Part - B: Descriptive paper for 20 marks.

   The objective/quiz paper is set with multiple choice, fill-in the blanks and match the following type of questions for a total of 10 marks. The descriptive paper shall contain 6 full questions out of which, the student has to answer 4 questions, each carrying 5 marks. The average of the two Mid Term Examinations shall be taken as the final marks for Mid Term Examination (for 30 marks). The remaining 10 marks of Continuous Internal Evaluation are distributed as:

2. Assignment for 5 marks. (Average of 2 Assignments each for 5 marks)

3. PPT/Poster Presentation/ Case Study/Video presentation/Survey/Field Study/Group discussion /Role Play on a topic in the concerned subject for 5 marks before II Mid-Term Examination.

   While the first mid-term examination shall be conducted on 50% of the syllabus, the second mid-term examination shall be conducted on the remaining 50% of the syllabus.

   Five (5) marks are allocated for assignments (as specified by the subject teacher concerned). The first assignment should be submitted before the conduct of the first mid-term examination, and the second assignment should be submitted before the conduct of the second mid-term examination. The average of the two assignments shall be taken as the final marks for assignment (for 5 marks).

   PPT/Poster Presentation/ Case Study/Video presentation/Survey/Field Study/Group discussion /Role Play on a topic in the concerned subject for 5 marks before II Mid-Term Examination.

UNIT - I

Part - A

Multiple Choice Questions

1. Speculator is a person _____.   [d]

   (a) who evaluates the performance of the company

   (b) who uses his own funds only

   (c) who is willing to take high risk for high return

   (d) who considers heresays and market behaviours

2. To frame the investment policy the investor should have _____.   [d]

   (a) knowledge about the company and brokers   (b) investible funds

   (c) knowledge about the investment alternatives (d) knowledge about the capital markets

3.   The stock is _____.   [b]

    (a)   made up of small units of equal value called shares

    (b)   expressed in terms of money

    (c)   expressed in terms of number of shares

    (d)   fully paid-up and partly paid-up shares

Fill in the Blanks

4.   _____ is the employment of funds with the aim of achieving additional income or growth
in value.   **(Investment)**

5.   A _____ system refers to a system which enables the transfer of money between investors
and borrowers.   **(Financial)**

6.   The _____ bills are referred as the short term liability of the central government in India.   **(Treasury)**

Short Notes

7.   Types of Investment   **(Unit-I, SQA - 2)**

8.   Investment Policy   **(Unit-I, SQA - 4)**

9.   Investment   **(Unit-I, SQA - 1)**

10.   Different Types of Orders   **(Unit-I, SQA - 7)**

Part - B

1.   Write about Indian Financial system focusing on financial services.   **(Unit-I, Q.No. 4)**

2.   Explain the various components of Indian financial system.   **(Unit-I, Q.No. 5)**

3.   Compare and investment and contrast gambling.   **(Unit-I, Q.No. 10)**

4.   Write in detail the structure of primary and secondary securities market in India.   **(Unit-I, Q.No. 16)**

5.   What is margin trading ? How is it helpful in investors?   **(Unit-I, Q.No. 19)**

6.   Define SEBI. Explain the purpose and role of SEBI.   **(Unit-I, Q.No. 22)**

7.   Discuss the rules and regulations of SEBI.   **(Unit-I, Q.No. 27)**

UNIT - II

Part - A

Multiple Choice Questions

1.   Interest rate risk occurs when _____.   [d]

    (a)   the market price of bond moves inversely to the prevailing market interest rate

    (b)   the variability in yield is due to the market interest rate fluctuations

    (c)   there is variability in the coupon interest rates

    (d)   all the above

2.   The statistical tool used to measure a company's risk is _____.   [c]

   (a)   mean   (b)   mode

   (c)   variance   (d)   co-variance

3.   In the active approach, the investor continuously studies _____.   [d]

   (a)   group-related risk   (b)   market-related risk

   (c)   security-specific risk   (d)   all the above

Fill in the Blanks

4.   _____ means a collection or combination of financial assets or securities such as
      shares, debentures and govt securities.   **(Portfolio)**

5.   _____ returns refer to the actual returns obtained from the investments.   **(Ex-post)**

6.   The term _____ from an investment refers to the benefits from that investment.   **(Return)**

Short Notes

7.   Capital Asset Pricing Model.   **(Unit-II, SQA - 11)**

8.   Capital Market Line.   **(Unit-II, SQA - 13)**

9.   Security Market Line (SML).   **(Unit-II, SQA - 14)**

10.   Portfolio selection.   **(Unit-II, SQA - 15)**

Part - B

1.   Define risk ? Explain the nature and scope of risk.   **(Unit-II, Q.No. 5)**

2.   What is Beta and how can you measure risk through Beta?   **(Unit-II, Q.No. 9)**

3.   Explain briefly about feasible set-of portfolio and efficient set-of portfolio.   **(Unit-II, Q.No. 12)**

4.   What are the assumptions of CAPM Model ?   **(Unit-II, Q.No. 15)**

5.   Briefly explain the Capital Market Line (CML) Concept, with the diagram and
      the formulae.   **(Unit-II, Q.No. 16)**

6.   Discuss in detail the theory of Arbitrage Pricing.   **(Unit-II, Q.No. 19)**

UNIT - III

Part - A

Multiple Choice Questions

1.   The marketability risk of a bond is _____.   [b]

   (a)   the market risk which affects all the bonds

   (b)   variation in return caused by the difficulty in selling bonds

   (c)   the failure to pay the agreed value of the bond by the issuer

   (d)   a and b

2. The value of the bond depends on _____.   [d]

(a) the coupon rate   (b) years to maturity

(c) expected yield to maturity   (d) all the above

3. Yield to maturity is the single factor that makes _____.   [c]

(a) the future value of the present cash flows from a bond equal to bond value

(b) the future value of present cash flows equal to the future price of the bond

(c) present value of the future cash flows of the bond equal to the current price of the bond

(d) the future value of the bond equal to the present price

Fill in the Blanks

4. A deep discount bond is another form of zero _____ bond.   **(Coupon)**

5. AYTM stands for _____.   **(Approximate Yield to Maturity)**

6. _____ is also useful for comparing bonds. If two bonds offer the same
    duration.   **(Convexity)**

Short Notes

7. Define Maturity.   **(Unit-III, SQA - 1)**

8. Define YTM.   **(Unit-III, SQA - 3)**

9. Define Current Yield.   **(Unit-III, SQA - 5)**

10. Define Deep Discount Bond (Or) Zero Coupon Bond.   **(Unit-III, SQA - 7)**

Part - B

1. Define bond. Explain the features of bond.   **(Unit-III, Q.No. 2)**

2. What is Bond Yields? Explain the various techniques in which the bond is
    calculated.   **(Unit-III, Q.No. 8)**

3. Explain briefly about Modified Duration of bond.   **(Unit-III, Q.No. 13)**

4. Discuss elaborately active and passive bond management strategies.   **(Unit-III, Q.No. 14)**

5. The face value of a bond is ₹ 1,000 coupon rate of 8% life of bond is 5 years
    and the market price of bond is ₹ 1,042. Compute YTM of this bond.   **(Unit-III, Prob. 1)**

6. A ₹ 100 per value bond bears a coupon rate of 14 percent and matures after
    five years. Interest is payable semi-annually. Compute the value of the bond if
    the required rate of return is 16%.   **(Unit-III, Prob. 3)**

7. An investor wants to evaluate the following bond :

Face value	Rs.100
Coupon value	12%
Maturity	3 years

    (a) The investor wants a yield of 15%. What is the maximum price that the
         should pay for it?

    (b) If the bond is selling for Rs.95 rupees, what would be his yield?   **(Unit-III, Prob. 5)**

$$\boxed{\textbf{UNIT - IV}}$$

Part - A

Multiple Choice Questions

1. The growth in book value per share shows the _____.   [d]
    (a) rise in the share price   (b) increase in the physical assets of the firm
    (c) increase in the net worth   (d) growth in reserves

2. A common stock pay-out ratio _____.   [b]
    (a) is directly related to the company's growth rate
    (b) can be zero for a growth firm
    (c) measures the earnings of a share as a percentage of its market price
    (d) indicates the future cash dividends to be expected

3. The price-earnings ratio of a stock reflects the _____.   [b]
    (a) growth of the company
    (b) market mood for the company's stock
    (c) earnings retained and invested in the company
    (d) dividend paid out for the company's stock

Fill in the Blanks

4. _____ selection is the primary use of the tools of equity valuation.   **(Stock)**

5. _____ flow model deals with the evaluation of firms value.   **(Free cash)**

6. _____ ratios are used to estimate the value of the stocks by the investors rather than
    adopting the discounting models.   **(Price-earnings)**

Short Notes

7. Equity Valuation.   **(Unit-IV, SQA - 1)**

8. Price to Book Value Ratio   **(Unit-IV, SQA - 2)**

9. Fundamental Analysis   **(Unit-IV, SQA - 4)**

10. Technical analysis   **(Unit-IV, SQA - 6)**

Part - B

1. What is equity valuation ? Explain the scope of equity valuation.   **(Unit-IV, Q.No. 1)**

2. Explain briefly about Intrinsic Value and Market Value.   **(Unit-IV, Q.No. 2)**

3. Discuss about various Equity Valuation Models.   **(Unit-IV, Q.No. 4)**

4. What is free cash flow model? Discuss the procedure involved in it.   **(Unit-IV, Q.No. 6)**

5. Discuss briefly about P/E Ratio (or) Earnings Multiplier Approach.   **(Unit-IV, Q.No. 8)**

6. Define Fundamental Analysis. State the objectives of fundamental analysis. **(Unit-IV, Q.No. 12)**

7. How moving averages are useful is studying trends and trend reversals?   **(Unit-IV, Q.No. 24)**

8. Differentiate between Fundamental Analysis and technical analysis.   **(Unit-IV, Q.No. 25)**

UNIT - V

Part - A

Multiple Choice Questions

1. The investors by investing in the mutual funds get _____.   [d]

   (a) professional management   (b) diversification

   (c) return potential   (d) all the above

2. The Sharpe index assigns the high value to funds that have _____.   [c]

   (a) low standard deviations   (b) higher returns

   (c) higher risk adjusted returns   (d) higher risk premium

3. In the Treynor index, the performance of the fund depends on the _____.   [c]

   (a) riskless rate of return

   (b) risk premium and standard deviation of funds return

   (c) risk premium and beta coefficient

   (d) risk premium and the standard deviation

Fill in the Blanks

4. A _____ is a financial instrument whose value depends on underlying assets.   **(Derivative)**

5. _____ are the oldest of all derivatives.   **(Forwards)**

6. A _____ contract is an agreement between two parties to buy or sell an asset at a certain time in future, at a certain price.   **(Future)**

Short Notes

7. Derivatives   **(Unit-V, SQA - 1)**

8. Features of Options   **(Unit-V, SQA - 2)**

9. Types of options.   **(Unit-V, SQA -3)**

10. Open-ended and Closed-ended Schemes   **(Unit-V, SQA - 7)**

Part - B

1. Explain in detail about overview of derivative markets in India.   **(Unit-V, Q.No. 2)**

2. Compare and contrast American and European Options.   **(Unit-V, Q.No.6)**

3. Discuss the various methods of option valuation.   **(Unit-V, Q.No.8)**

4. What are the assumptions of Black and Scholes option pricing model?   **(Unit-V, Q.No. 9)**

5. From the following data, Calculate Sharpe's Index and Interpret the result:

   Portfolio X: Expected Return Rp = 15%, σp = 5%

   Portfolio Y: Expected Return Rp = 20%; σp = 6%

   Risk-free Rate of Return (Rf) = 10%   **(Unit-V, Prob.No.11)**

6.   State the differences between closed-ended and Open-ended Schemes.   **(Unit-V, Q.No.25)**

7.   Mr. Anand is having units in a mutual fund for the past three years. He wants to evaluate its performance by comparing it to the market.

	Fund	Market
Return	70.60	41.40
Standard deviation	41.31	19.44
Risk Free Rate	2%	2
β	1.12	–

Find out Sharpe and Treynor indices. Comment   **(Unit-V, Prob. No. 14)**

8.   Pearl and Diamond are the two funds, Pearl has a mean success of 0.15 and Diamond has 0.22. The Diamond has double the beta of Pearl fund's 1.5. The standard deviations of Pearl and Diamond funds 15% and 21.43%. The mean return of market index is 12% and its standard deviations is 7. The risk-free rate is 8%.

(a)   Compute the Jensen Index for each fund.

(b)   Compute the Treynor and Sharpe indices for the funds. Interpret the results.

(Unit-V, Prob.No. 16)

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

M.B.A III Semester Examinations

R22

MODEL PAPER - I

SECURITY ANALYSIS AND PORTFOLIO MANAGEMENT

Time : 3 Hours]   **[Max. Marks : 60**

Note : This question paper contains two parts **A** and **B**.

      Part A is compulsory which carries 10 marks. Answer all questions in **Part A.**

      Part B consists of 5 Units. Answer any **One** full question from each unit.

      Each question carries 10 marks and may have a, b, c as sub questions.

PART - A (10 × 1 = 10 Marks)

ANSWERS

1.   (a)   Investment Policy.   **(Unit - I, SQA-4)**

      (b)   Secondary Markets.   **(Unit - I, SQA-6)**

      (c)   Capital Asset Pricing Model.   **(Unit - II, SQA-11)**

      (d)   Security Market Line (SML).   **(Unit - II, SQA-14)**

      (e)   Define YTM.   **(Unit - III, SQA-3)**

      (f)   Define Maturity.   **(Unit - III, SQA-1)**

      (g)   Dow Theory.   **(Unit - IV, SQA-7)**

      (h)   Equity Valuation.   **(Unit - IV, SQA-1)**

      (i)   Explain Protective Put and Covered Call.   **(Unit - V, SQA-10)**

      (j)   Features of Options.   **(Unit - V, SQA-2)**

PART - B (5 × 10 = 50 Marks)

2.   What is financial system. What are the characteristics of good financial system.   **(Unit - I, Q.No.3)**

OR

3.   Discuss briefly about Investment Environment.   **(Unit - I, Q.No.15)**

4.   What is Beta and how can you measure risk through Beta?   **(Unit - II, Q.No.9)**

OR

5.   Assume yourself as portfolio manager and with the help of the following details, find

      out the securities that are overpriced and underpriced in terms of SML.

Security	Expected Return	β	α
A	0.33	1.70	0.50
B	0.13	1.40	0.35
C	0.26	1.10	0.40
D	0.12	0.95	0.24
Nifty index	0.13	1.00	0.20
T-bills	0.09	0.00	0.00

(Unit - II, Prob.14)

6. Define fixed income securities. What are the different types of Fixed Income

   Securities?   **(Unit - III, Q.No.1)**

   OR

7. The face value of a bond is ₹ 1,000 coupon rate of 8% life of bond is 5 years

   and the market price of bond is ₹ 1,042. Compute YTM of this bond.   **(Unit - III, Prob.1)**

8. What is equity valuation ? Explain the scope of equity valuation.   **(Unit - IV, Q.No.1)**

   OR

9. Discuss briefly about P/E Ratio (or) Earnings Multiplier Approach.   **(Unit - IV, Q.No.8)**

10. Discuss briefly about various option strategies.   **(Unit - V, Q.No.7)**

    OR

11. From the following data, Calculate Sharpe's Index and Interpret the result:
    Portfolio X: Expected Return Rp = 15%, σp = 5%
    Portfolio Y: Expected Return Rp = 20%; σp = 6%

    Risk-free Rate of Return (Rf) = 10%   **(Unit - V, Prob.11)**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

M.B.A III Semester Examinations

R22

MODEL PAPER - II

SECURITY ANALYSIS AND PORTFOLIO MANAGEMENT

Time : 3 Hours]   **[Max. Marks : 60**

Note : This question paper contains two parts **A** and **B**.

Part A is compulsory which carries 10 marks. Answer all questions in **Part A.**

Part B consists of 5 Units. Answer any **One** full question from each unit.

Each question carries 10 marks and may have a, b, c as sub questions.

PART - A (10 × 1 = 10 Marks)

ANSWERS

1.	(a)	Margin Trading.	**(Unit - I, SQA-8)**
	(b)	Gambling.	**(Unit - I, SQA-12)**
	(c)	Capital Market Line.	**(Unit - II, SQA-13)**
	(d)	Portfolio selection.	**(Unit - II, SQA-15)**
	(e)	Define Current Yield.	**(Unit - III, SQA-5)**
	(f)	Define Bond Immunisation.	**(Unit - III, SQA-9)**
	(g)	EMH.	**(Unit - IV, SQA-8)**
	(h)	Relative Valuation	**(Unit - IV, SQA-9)**
	(i)	Types of options.	**(Unit - V, SQA-3)**
	(j)	Open-ended and Closed-ended Schemes	**(Unit - V, SQA-7)**

PART - B (5 × 10 = 50 Marks)

2. Write about Indian Financial system focusing on financial services.   **(Unit - I, Q.No.4)**

OR

3. What do you mean by Securities Market? Classify Security Market in detail.   **(Unit - I, Q.No.16)**

4. A Bank is managing a Portfolio of Stocks with the following Market Values and Betas (βi).
   Find the Beta of the Portfolio:

Stocks	P1	P2	P3	P4	P5
Market Value (Rs.)	1,00,000	2,00,000	3,00,000	2,50,000	1,50,000
Betas (βi)	1.1	1.6	0.8	1.2	2.0

(Unit - II, Prob.2)

OR

5.   What is Markowitz Model ? Explain its assumptions and limitations.   **(Unit - II, Q.No.10)**

6.   What is Bond Yields? Explain the various techniques in which the bond is

      calculated.   **(Unit - III, Q.No.8)**

OR

7.   A ₹ 100 per value bond bears a coupon rate of 14 percent and matures after

      five years. Interest is payable semi-annually. Compute the value of the bond if

      the required rate of return is 16%.   **(Unit - III, Prob.3)**

8.   Discuss about dividend discount models in detail.   **(Unit - IV, Q.No.5)**

OR

9.   Define Fundamental Analysis. State the objectives of fundamental analysis.   **(Unit - IV, Q.No.12)**

10.   Six portfolios experienced the following results during a seven year period :

Portfolio	Average Annual Return (%)	Standard Deviation (%)	Correlation with Market
A	18.6	27.0	0.81
B	14.8	18.0	0.65
C	15.1	8.0	0.98
D	22.0	21.2	0.75
E	– 9.0	4.0	0.45
F	26.5	19.3	0.63
Market	13.0	12.0	–
Risk Free Rate	9.0	–	–

(Unit - V, Prob.17)

OR

11.   State the differences between closed-ended and Open-ended Schemes.   **(Unit - V, Q.No.26)**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

M.B.A III Semester Examinations

R22

MODEL PAPER - III

SECURITY ANALYSIS AND PORTFOLIO MANAGEMENT

Time : 3 Hours]   **[Max. Marks : 60**

Note : This question paper contains two parts **A** and **B**.

         Part A is compulsory which carries 10 marks. Answer all questions in **Part A.**

         Part B consists of 5 Units. Answer any **One** full question from each unit.

         Each question carries 10 marks and may have a, b, c as sub questions.

<div align="center">

PART - A (10 × 1 = 10 Marks)

</div>

ANSWERS

1.	(a)	Different Types of Orders.	**(Unit - I, SQA-7)**
	(b)	Diversification of the Company.	**(Unit - I, SQA-5)**
	(c)	Objectives of Portfolio Management.	**(Unit - II, SQA-1)**
	(d)	Sources of Risk.	**(Unit - II, SQA-2)**
	(e)	Define Deep Discount Bond (Or) Zero Coupon Bond.	**(Unit - III, SQA-7)**
	(f)	Define Interest Rates.	**(Unit - III, SQA-10)**
	(g)	Price to Book Value Ratio	**(Unit - IV, SQA-2)**
	(h)	Compare and contrast Weak forms and Strong form of market efficiency.	**(Unit - IV, SQA-10)**
	(i)	Derivatives.	**(Unit - V, SQA-1)**
	(j)	Covered call and straddle.	**(Unit - V, SQA-9)**

<div align="center">

PART - B (5 × 10 = 50 Marks)

</div>

2. What are the steps involved in the investment process.   **(Unit - I, Q.No.13)**

<div align="center">OR</div>

3. Briefly explain the Securities Institutions viz., NSE, SEBI and NSDI., which provide

    greater scope for Indian Stock Markets.   **(Unit - I, Q.No.17)**

4. Find out risk and return for the following two securities R and P in different conditions of the market.

Market conditions	Return of security P	Return of security R	Probability
Bull	25%	40%	0.3
Normal	20%	10%	0.5
Bear	15%	20%	0.2

                                                                  (Unit - II, Prob.9)

<div align="center">OR</div>

5. Define Capital Asset Pricing Model. Explain its assumptions.   **(Unit - II, Q.No.15)**

6. Discuss elaborately active and passive bond management strategies.   **(Unit - III, Q.No.14)**

<div align="center">OR</div>

7. An investor wants to evaluate the following bond :

Face value	Rs.100
Coupon value	12%
Maturity	3 years

   (a) The investor wants a yield of 15%. What is the maximum price that the should pay for it?

   (b) If the bond is selling for Rs.95 rupees, what would be his yield?   **(Unit - III, Prob.5)**

8. Discuss about various Equity Valuation Models.   **(Unit - IV, Q.No.4)**

<div align="center">OR</div>

9. Differentiate between Fundamental Analysis and technical analysis.   **(Unit - IV, Q.No.25)**

10. What are the assumptions of Black and Scholes option pricing model?   **(Unit - V, Q.No.9)**

<div align="center">OR</div>

11. Given the following information.

	Portfolio A	Portfolio B
Beta	0.9	1.8
Return (%)	12.5	19
SD (%)	20	26.5

   Risk free rate of return 6% Market return = 12%

   Calculate

   (i) Sharpe Ratio

   (ii) Treynor Ratio

                                                                                (Unit - V, Prob.12)

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

M.B.A II - Year III - Semester Examination

December - 2018

R17

SECURITY ANALYSIS AND PORTFOLIO MANAGEMENT

Time : 3 Hours]　　　　　　　　　　　　　　　　　　　　　　[Max. Marks : 75

Note : This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part - A.

Part - B contains of 5 Units. Answer any one full question from each unit.

Each question carries 10 marks and may have a, b, c as sub questions.

PART - A (5 × 5 = 25 Marks)
(Short Answer Questions)

ANSWERS

1. Write short notes on the following :

    (a) Gambling   **(Unit-I, SQA-12)**

    (b) Portfolio Selection   **(Unit-II, SQA-15)**

    (c) Interest Rates   **(Unit-III, SQA-10)**

    (d) Relative Valuation   **(Unit-IV, SQA-10)**

    (e) P/E Ratio   **(Unit-IV, Q.No.8)**

PART - B (5 × 10 = 50 Marks)
(Essay Type Questions)

2. Explain in detail the Investment Environment.   **(Unit-I, Q.No. 15)**

(OR)

3. Discuss in detail the various types of orders.   **(Unit-I, Q.No. 18)**

4. Explain in detail Arbitrage Pricing Theory and explain its salient features.   **(Unit-II, Q.No. 19)**

(OR)

5. Discuss in detail Capital Asset Pricing Model and its application.   **(Unit-II, Q.No. 15)**

6. Explain in detail the various bond pricing theorems.   **(Unit-III, Q.No. 10)**

(OR)

7. Discuss elaborately active and passive bond management strategies.   **(Unit-III, Q.No. 14)**

8. Explain in detail various techniques of relative valuation.   **(Unit-IV, Q.No. 7)**

(OR)

9. Discuss in detail about Efficient Market Hypothesis.   **(Unit-IV, Q.No. 27)**

10. Explain in detail various option strategies and option valuation.   **(Unit-V, Q.No. 7, 8)**

(OR)

11. Briefly explain various models of performance evaluation.   **(Unit-V, Q.No. 31)**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
MBA III-Semester Examinations
April / May - 2019

R17

SECURITY ANALYSIS AND PORTFOLIO MANAGEMENT

Time : 3 Hours]   [Max. Marks : 75

Note: This question paper contain two Parts **A** and **B**

Part **A** is compulsory which carries 25 marks. Answer all questions in **Part A.**

Part **B** consists of 5 Units. Answer any One full question from each unit.

Each question carries 10 marks and may have a, b, c as sub questions.

ANSWERS

PART - A (5 × 5 = 25 Marks)
(Short Answer Type)

1. (a) Distinguish between Investment and Speculation.   **(Unit-I, Q.No. 10)**

    (b) Explain the features of Indifference Curves.   **(Unit-II, SQA-18)**

    (c) Explain Holding period return and Yield to call   **(Unit-III, SQA-6,11)**

    (d) Compare and contrast Weak forms and Strong form of market efficiency. **(Unit-IV, SQA-9)**

    (e) Explain Protective Put and Covered Call.   **(Unit-V, SQA-10)**

PART - B (5 × 10 = 50 Marks)
(Essay Answer Type)

2. (a) Compare and contrast Capital Market and Money Market.   **(Unit-I, Q.No. 6)**

    (b) Discuss about securities trading and settlement.   **(Unit-I, Q.No. 17)**

(OR)

3. (a) What is Margin Trading ?   **(Unit-I, Q.No. 19)**

    (b) Explain the various money market instruments.   **(Unit-I, Q.No. 7)**

4. The estimates of the standing deviation and correlation co-efficient for three stock are given below.

Stock	Standard deviation	Correlation with Stock		
		A	B	C
A	32	1.00	– 0.80	0.40
B	26	– 0.80	1.00	0.65
C	18	0.40	0.65	1.00

If a portfolio is constructed with 15% of stock A, 50% of stock B and 35% of stock C.
What is the portfolios standard deviation ?   **(Unit-II, Prob. 4)**

(OR)

5.   (a)   Explain single index model   **(Unit-II, Q.No. 14)**

     (b)   What is Efficient Frontier ? Explain risk free lending and borrowing.   **(Unit-II, Q.No. 12)**

6.   (a)   Explain the various types of Bonds.   **(Unit-III, Q.No. 4)**

     (b)   A Reliance industries debenture with a face value of ₹ 100 has a coupon of
           10% per annum coupon payment being made annually. The maturity date of
           the instrument is 7th May 2018. The traded price of the bond on 7th May 2016
           is ₹ 110. Compute the yield to maturity of the bond.   **(Unit-III, Prob. 2)**

                                    (OR)

7.   (a)   A ₹ 100 per value bond bears a coupon rate of 14 percent and matures after
           five years. Interest is payable semi-annually. Compute the value of the bond if
           the required rate of return is 16%.   **(Unit-III, Prob. 3)**

     (b)   What is bond volatility and bond convexity ?   **(Unit-III, Q.No. 16, 17)**

8.   A company paid dividends amounting to 0.75 per share during the last year. The
     company is expected to pay ₹ 2 per share during the next year. Investors forecast a
     dividend of ₹ 3 per share in the year after that. Therefore it is expected that dividends
     will grow at 10 percent per year into an indefinite future. Would you buy/sell the
     share if the current prices of the share is ₹ 54 ? Investors required rate of return is 15
     percent.   **(Unit-IV, Prob. 13)**

                                    (OR)

9.   (a)   Describe the key economic variables that an investor must monitor as part of
           his fundamental analysis.   **(Unit-IV, Q.No. 14)**

     (b)   Explain about chart pattern and Relative Strength Index.   **(Unit-IV, Q.No. 26)**

10. (a)   The share of Omega Company which is not expected to pay dividend in the
           near future is currently selling for ₹ 150. The risk-free rate is 0.8 per a month.
           A 3-month futures contract is selling for ₹ 152. Develop an arbitrage strategy
           and show what your profit will be 6.3 months hence.   **(Unit-V, Prob. 6)**

     (b)   Distinguish between futures and forwards.   **(Unit-V, Q.No. 18)**

                                    (OR)

11. (a)   Given the following information.

	Portfolio A	**Portfolio B**
Beta	0.9	1.8
Return (%)	12.5	19
SD (%)	20	26.5

           Risk free rate of return 6% Market return = 12%

           Calculate   (i) Sharpe Ratio   (ii) Treynor Ratio   **(Unit-V, Prob. 12)**

     (b)   Explain the types of mutual funds in India.   **(Unit-V, Q.No. 24)**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

M.B.A III - Semester Examination

R17

December - 2019

SECURITY ANALYSIS AND PORTFOLIO MANAGEMENT

Time : 3 Hours]   [Max. Marks : 75

Note :   This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part - A.

Part - B contains of 5 Units. Answer any one full question from each unit.

Each question carries 10 marks and may have a, b, c as sub questions.

PART - A (5 × 5 = 25 Marks)

ANSWERS

1.   Write a short notes on the following :

    (a)   Gambling   **(Unit-I, SQA-12)**

    (b)   YTM and YTC   **(Unit-III, SQA-3, 11)**

    (c)   Efficient Frontier   **(Unit-II, SQA-17)**

    (d)   Economic Value added Approach   **(Unit-IV, SQA-8)**

    (e)   Covered call and straddle   **(Unit-V, SQA-9)**

PART - B (5 × 10 = 50 Marks)

2.   (a)   Explain the investment environment in India.   **(Unit-I, Q.No. 15)**

    (b)   Differentiate between Investment and Speculations.   **(Unit-I, Q.No. 9)**

(OR)

3.   (a)   Briefly explain the Securities Institutions viz., NSE, SEBI and NSDI.,

        which provide greater scope for Indian Stock Markets.   **(Unit-I, Q.No. 17)**

    (b)   Explain about Margin Trading.   **(Unit-I, Q.No. 19)**

4.   (a)   What is Beta and how can you measure risk through Beta ?   **(Unit-II, Q.No. 9)**

    (b)   A Bank is managing a Portfolio of stocks with the following Market Value and betas (β). Find the Beta of the portfolio.   **(Unit-II, Prob. 2)**

Stocks	P_1	P_2	P_3	P_4	P_5
Market Value (₹)	1,00,000	2,00,000	3,00,000	2,50,000	1,50,000
Betas (βi)	1.1	1.6	0.8	1.2	2.0

(OR)

5.   (a)   Briefly explain the Capital Market Line (CML) Concept, with the diagram and the formulae.   **(Unit-II, Q.No. 16)**

    (b)   What are the assumptions of CAPM Model ?   **(Unit-II, Q.No. 15)**

6. (a) What is a Bond? Briefly explain (i) Bond Volatility and
         (ii) Bond Convexity.   **(Unit-III, Q.No. 1, 16, 17)**

    (b) The face value of a bond is ₹ 1,000 coupon rate of 8% life of bond is 5 years
         and the market price of bond is ₹ 1,042. Compute YTM of this bond.   **(Unit-III, Prob. 1)**

7. (a) Xavier purchased, at par, a Bond with a face value of ₹ 1,000, at 10% Coupon
         Rate, having 5 years to maturity. The bond was called 3 years later, for a price
         of ₹ 1,300, after making the second annual interest payment. Xavier then
         reinvested the proceeding in a Bond selling at its face value of ₹ 1,000, with 3
         years to maturity and 8% Coupon Rate. What is Xavier's YTM over the 5 year
         period ?   **(Incomplete Problem)**

    (b) Explain Bond Duration.   **(Unit-III, Q.No. 11)**

8. (a) What is Equity Valuation ? Briefly explain : (i) Liquidation Value and
         (ii) Free Cash Flow Model.   **(Unit-IV, Q.No. 4, 6)**

    (b) Discuss the types of Mutual funds in India.   **(Unit-V, Q.No. 24)**

                                        OR

9. (a) Differentiate between fundamental and technical analysis.   **(Unit-IV, Q.No. 25)**

    (b) Write briefly about Efficient Market Hypothesis.   **(Unit-IV, Q.No. 27)**

10. (a) Compare and contrast Futures and Forward contract.   **(Unit-V, Q.No. 16)**

    (b) What are the assumptions of Black and Scholes option pricing model ?   **(Unit-V, Q.No. 8)**

                                        OR

11. (a) Explain about NAV, Expense ratio, Fund of Funds.   **(Unit-V, Q.No. 28, 29)**

    (b) From the following data, Calculate Sharpe's Index and Interpret the result :

         Portfolio X: Expected Return $Rp = 15\%$, $\sigma p = 5\%$

         Portfolio Y: Expected Return $Rp = 20\%$; $\sigma p = 6\%$

         Risk-free Rate of Return $(Rf) = 10\%$ **(Unit-V, Prob. 11)**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

M.B.A III - Semester Examination
October / November - 2020

R17

SECURITY ANALYSIS AND PORTFOLIO MANAGEMENT

Time : 2 Hours]   [Max. Marks : 75

Answer any five questions
All questions carry equal marks

ANSWERS

1. Discuss in detail the important features of Securities Trading and Settlement.   **(Unit-I, Q.No. 17)**

2. Describe the important aspects of Capital Asset pricing model.   **(Unit-II, Q.No. 15)**

3. Discuss in detail the theory of Arbitrage Pricing.   **(Unit-II, Q.No. 19)**

4. Explain the term structure of interest rates.   **(Unit-III, Q.No. 7)**

5. Describe the importance of Active and Passive bond management.   **(Unit-III, Q.No. 14)**

6. Discuss in detail the concept of Economic value added approach.   **(Unit-IV, Q.No. 11)**

7. Explain in detail fundamental and technical analysis.   **(Unit-IV, Q.No. 12, 19)**

8. Discuss the trends in Indian Mutual Funds.   **(Unit-V, Q.No. 27)**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

M.B.A III - Semester Examination

R19

July / August - 2021
SECURITY ANALYSIS AND PORTFOLIO MANAGEMENT

Time : 2 Hours]   [Max. Marks : 75

Answer any five questions
All questions carry equal marks

ANSWERS

1.   Write in detail the structure of primary and secondary securities market in India.   **(Unit-I, Q.No. 16)**

2.   (a)   What is margin trading ? How is it helpful in investors?   **(Unit-I, Q.No. 19)**

     (b)   What are the factors to be considered by an investor before making
           investment decision?   **(Unit-I, Q.No. 14)**

3.   David's portfolio consists of an investment in risky portfolio with a 12% expected
     return and 25% standard deviation and a risk free asset with 7% return. If David's
     total portfolio has a 20% standard deviation, what is its expected returns?   **(Unit-II, Prob. 12)**

4.   How does the efficient set change, when risk free borrowing and lending are intro-
     duced into the Markowitz model? Explain with words and graphical-sketch.   **(Unit-II, Q.No. 12)**

5.   The following information is available in respect of security X and Y.

Security	Beta	Expected Returns
X	1.8	22.00%
Y	1.6	20.40%

     If the risk free rate is 7%, are these securities correctly priced? What the risk free
     rate has to be if they are correctly priced?   **(Unit-II, Prob. 5)**

6.   What do you mean by immunization? How would you construct an immunized
     portfolio? Use an example to illustrate your point.   **(Unit-III, Q.No. 15)**

7.   (a)   a company has paid a dividend of Rs. 2 per share during the last year. The
           estimated growth of dividends is expected to be 5% p.a. Determine the
           estimated marked price of equity share if the estimated growth rate of dividends:
           (a) raises to 8% and (b) falls by 3%. Also find out the present market price of
           the share, given the required rate of return of the equity investors is 155%.   **(Unit-IV, Prob. 11)**

     (b)   What is technical analysis? What are its advantages and limitations?   **(Unit-IV, Q.No. 19, 20)**

8.   (a)   The spot price of a bond is Rs. 900 and one year future rate is Rs. 930.
           Interest payments of Rs. 40 are due after 6 months and after one year from
           today. The risk free rate of interest for 6 months and one year period are 9%
           and 10% respectively. Find out the profit of the investors. What should be his
           strategy if he holds one bond and the futures price is Rs. 905?   **(Unit-V, Prob. 5)**

     (b)   Why does performance evaluation require an appropriate bench mark to be
           meaningful?   **(Unit-V, Q.No. 36)**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

MBA III - Semester Examinations

R19

March / April - 2022

SECURITY ANALYSIS AND PORTFOLIO MANAGEMENT

Time : 3 Hours | Max. Marks : 75

Answer any five questions
All questions carry equal marks

ANSWERS

1. (a) Describe briefly the various investment avenues available to the investors.   **(Unit-I, Q.No. 12)**

    (b) Differentiate between investment and speculation.   **(Unit-I, Q.No. 9)**

2. Discuss the following

    (a) Investment process   **(Unit-I, Q.No. 13)**

    (b) Securities market of India   **(Unit-I, Q.No. 17)**

3. (a) What is Beta and how can you measure risk through Beta ?   **(Unit-II, Q.No. 9)**

    (b) A Bank is managing a Portfolio of Stocks with the following Market Values and Betas (βi). Find the Beta of the Portfolio:

Stocks	P1	P2	P3	P4	P5
Market Value (Rs.)	1,00,000	2,00,000	3,00,000	2,50,000	1,50,000
Betas (βi)	1.1	1.6	0.8	1.2	2.0

(Unit-II, Prob. 2)

4. (a) Briefly explain the Capital Market Line (CML) Concept. With the diagram and the formula.   **(Unit-II, Q.No. 16)**

    (b) What are the assumptions of CAPM Model?   **(Unit-II, Q.No. 15)**

5. (a) What is a Bond? Briefly explain :

    (i) Bond Volatility; and

    (ii) Bond Convexity   **(Unit-III, Q.No. 2, 16, 17)**

    (b) The face value of a bond is Rs. 1000/- coupon rate of 8% life of bond is 5 years and the market price of bond is Rs.1042 Compute YTM of this bond.   **(Unit-III, Prob. 1)**

6. (a) Xavier purchased, at par, a Bond with a face value of Rs. 1000, at 10% Coupon Rate, having 5 years to maturity. The bond was called 3 years later, for a price of Rs 1,300/- after making the second annual interest payment. Xavier then reinvasted the proceeding in a Bond selling at its face value of Rs. 1,000 with 3 years to maining and 8% Coupon Rate.
    What is Xavier's YTM over the 5-year period.   **(Incomplete Problem)**

	(b)	Explain Bond Duration.	(Unit-III, Q.No. 11)
7.	(a)	How moving averages are useful is studying trends and trend reversals?	(Unit-IV, Q.No. 24)
	(b)	What is the implication of semi-strong form market?	(Unit-IV, Q.No. 27)
8.	(a)	Compare and contrast Futures and Forward contract.	(Unit-V, Q.No. 18)
	(b)	What are the assumptions of Black and Scholes option pricing model?	(Unit-V, Q.No. 9)

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

MBA III - Semester Examinations

R19

March / April - 2023

SECURITY ANALYSIS AND PORTFOLIO MANAGEMENT

Time : 3 Hours   **Max. Marks : 75**

Note: (i)   Question paper consists of Part A, Part B.

(ii) Part A is compulsory, which carries 25 marks. In Part A, Answer all questions.

(iii) In Part B, Answer any one question from each unit. Each question carries

10 marks and may have a, b as sub questions.

PART - A (5 × 5 = 25)

ANSWERS

1.   (a) What factors must be considered by an investor while making investment
         decisions?   **(Unit-I, SQA-11)**

(b) What is systematic risk? What is unsystematic risk?   **(Unit-II, SQA-16)**

(c) What are the factors involved in bond valuation? Briefly explain.   **(Unit-III, SQA-12)**

(d) Briefly discuss efficient market hypothesis.   **(Unit-IV, SQA-8)**

(e) Write a note on organization of mutual fund.   **(Unit-V, SQA-5)**

PART - A (10 × 5 = 50)

2.   (a) Distinguish between investment and speculation.   **(Unit-I, Q.No. 9)**

(b) Writb a note on Sensex.   **(Unit-I, Q.No. 20)**

OR

3.   (a) Explain in detail the methodology adopted in trading shares in stock exchange. **(Unit-I, Q.No. 21)**

(b) Brief on investment process.   **(Unit-I, Q.No. 13)**

4.   (a) Find out Risk and Return on the following two securities R and P in different
         conditions of the market.   **(Unit-II, Prob. 9)**

Market conditilons Return of Security R Return of Security P Probability

Market conditilons	Return of Security R	Return of Security P	Probability
Bull	25%	40%	0.30
Normal	20%	10%	0.50
Bear	15%	−20%	0.20

(b) Brief on single-index model.   **(Unit-II, Q.No. 14)**

5.   (a) HOW-does MarkoWitz. Theory help in planning an investor's portfolio?   **(Unit-II, Q.No. 10)**

(b) What is arbitrage? What are the assumptions of Arbitrage pricing theory?   **(Unit-II, Q.No. 19)**

6. (a) Following information is available in respect of a bond:

Face value	Rs.100
Market value	Rs. 96.44
Coupon rate	8%
Yield to maturity	10%
Duration	1.92 years

Find out Modified duration. If there is a decrease in YTM to 9%, find out the new expected market price.   **(Unit-III, Prob. 4)**

(b) Describe the types of bonds.   **(Unit-III, Q.No. 4)**

7. An investor wants to evaluate the following bond :

Face value	Rs.100
Coupon value	12%
Maturity	3 years

(Unit-III, Prob. 5)

(a) The investor wants a yield of 15%. What is the maximum price that he should pay for it?

(b) If the bond is selling for Rs.95 rupees, what would be his yield?

8. (a) Describe the equity valuation models.   **(Unit-IV, Q.No. 4)**

(b) The current price of a company share is Rs.70. The company is expected to pay a dividend of Rs.4.20 per share increasing with an annual growth rate of 5%. If an investor's required rate of return is 10%, should he buy the share?   **(Unit-IV, Prob. 12)**

OR

9. (a) What are the approaches to valuation of an equity share?   **(Unit-IV, Q.No. 7)**

(b) What is P/E ratio? How does it differ from V/E ratio.   **(Unit-IV, Q.No. 8)**

10. (a) Examine the types of mutual fund schemes.   **(Unit-V, Q.No. 24)**

(b) Spot price of a particular share is Rs.620 with an exercise price of call option Rs.600 with time to expiration 6 months, risk- free rate of return 12% and volatility of the share is 30%. Calculate price of the call option.   **(Unit-V, Prob. 7)**

11. (a) What do you understand by Systematic Investment Plan(SIP)? How does it benefit investors?   **(Unit-V, Q.No. 37)**

(b) Discuss Sharpe's Performance Measure.   **(Unit-V, Q.No. 32)**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

MBA III - Semester Examinations

R22

February - 2024

SECURITY ANALYSIS AND PORTFOLIO MANAGEMENT

Time : 3 Hours]   **[Max. Marks : 60]**

Note : This question paper contains two parts A and B. i) Part - A for 10 marks, ii) Part-B for 50 marks.

- Part-A is a compulsory question which consists of ten sub-questions from all units carrying equal marks.

- Part-B consists of ten questions (numbered from 2 to 11) carrying 10 marks each. From each unit, there are two questions and the student should answer one of them. Hence, the student should answer five questions from Part-B.

PART-A (10 Marks)

                                                      ANSWERS

1.   (a)   What is Margin Trading   **(Unit - I, SQA-8)**

       (b)   Define Limit Order   **(Unit - I, SQA-7)**

       (c)   What is Efficient Portfolio   **(Unit - II, Q.No. 12)**

       (d)   Brief on CAPM Equation

Ans :

$r_f = r_f = \beta_i (r_m - r_f)$

       (e)   Define Bond Convexity.   **(Unit - III, Q.No. 17)**

       (f)   Describe Current Yield   **(Unit - III, Q.No. 8)**

       (g)   How to measure Intrinsic Value of a Share.   **(Unit - IV, Q.No. 2)**

       (h)   Importance or Price Earnings Ratio.   **(Unit - IV, Q.No. 8)**

       (i)   What are the Financial Assets.

Ans :

A financial asset is a liquid asset that gets its value from a contractual right or ownership claim. Cash, stocks, bonds, mutual funds, and bank deposits are all are examples of financial assets. Unlike land, property, commodities, or other tangible physical assets, financial assets do not necessarily have inherent physical worth or even a physical form. Rather, their value reflects factors of supply and demand in the marketplace in which they trade, as well as the degree of risk they carry.

       (j)   Describe the Pay off in options.

Ans :

The payoff is the profit an option can earn under different price conditions, with the strike price as the reference point. A payoff diagram is a graphical representation of an option's potential profits and losses at expiration.

PART-B (50 Marks)

2.   Depict the Indian financial system, and explain its constituent elements like

       markets, products, players, intermediaries and regulators.   **(Unit - I, Q.No. 4)**

                                                OR

3.   (a)   Explain the step by step process trading of securities and their settlement.   **(Unit - I, Q.No. 16)**

       (b)   Illustrate the role and responsibilities of SEBI.   **(Unit - I, Q.No. 22, 25)**

4.   Explain the Markowitz Portfolio Theory, and state its uses and limitations.   **(Unit - II, Q.No. 10)**

                                                OR

5.   (a)   The following are the returns on Market and Return on Security A, for the past

              5 years

Years	1st	2nd	3rd	4th	5th
Market Returns (%)	30	20	35	30	40
Security "A" Returns (%)	35	25	30	35	30

              calculate the BETA of security "A".

Sol :

       The historical returns for the Market and Security A

       Over the past 5 years :

       Market Returns (%) : 30, 20, 35, 30, 40

       Security A returns (%) : 35, 25, 30, 35, 30

       Calculate the Average Returns

       Market Returns (%) : 30, 20, 35, 30, 40

       Average Market Return $= \dfrac{30 + 20 + 35 + 30 + 40}{5}$

                                $= 31$

       Security A Returns (%) : 35, 25, 30, 35, 30

       Average Security A Return $= \dfrac{35 + 25 + 30 + 35 + 30}{5}$

                                $= 31$

       Calculate the Covariance

       Covariance Formula :

       Cov $(X, Y) = \dfrac{1}{N} \sum_{i=1}^{N}(X_i - \overline{X})(Y_i - \overline{Y})$

       Where :

       $(X - \overline{X})$ $(Y - \overline{Y})$ = Market Returns

       $\overline{X}$ = Average Market returns

       Y_i = Security A returns

$\overline{Y}$ = Average Security A return

N = Number of observations

Calculate each term :

Year	Market Return	Security A	$X - \overline{X}$ (X)	$Y - \overline{Y}$ (Y)	(XY)
1	30	35	30 – 31 = 1	35 – 31 = 4	(–1)×4 = – 4
2	20	25	20 – 31 = 11	25 – 31 = 11	(–11)×(–6)=66
3	35	30	35 – 31 = 4	30 – 31 = – 1	4×(–1) = – 4
4	30	35	30 – 31 = – 1	35 – 31 = 34	(–1)×4 = – 4
5	40	30	40 – 31 = 9	30 – 31 = – 1	9×(–1) = – 9

Sum of Products = 4 + 66 – 4 – 4 – 9 = 53

Covariance

$$\text{Cov}(X, Y) = \frac{45}{5} = 9$$

Calculate the Variance of Market Returns

$$\text{Var}(X) = \frac{1}{N} \sum_{i=1}^{N}(X_i - \overline{X})^2$$

Calculate each term

Year	Market Return	$X - \overline{X}$	$(X - \overline{X})^2$
1	30	–1	1
2	20	– 11	121
3	35	4	16
4	30	–1	1
5	40	9	81

Sum of Squares = 1 + 121 + 16 + 1 + 81

           = 220

$$\text{Var}(X) = \frac{220}{5}$$

       = 44

Calculate Beta

$$\beta = \frac{\text{Cov}(X, Y)}{\text{Var}(X)}$$

$$\beta = \frac{9}{44}$$

     = 0.20

(b)   Brief on capital asset pricing model.   **(Unit - II, Q.No. 15)**

6.   (a)   Explain the Bond Pricing theorems with suitable examples.   **(Unit - III, Q.No. 10)**

     (b)   Describe the tools used for measuring bond yields.   **(Unit - III, Q.No. 8, 9)**

<div align="center">OR</div>

7.   (a)   A Bond with a face value of Rs. 1000, coupon rate of 8% PA, will mature at par in 9 years. Its current market price is Rs. 850. Calculate the yield to maturity of the Bond by trial and error method.

Sol :

Given that

Face value of the bond P_n = ₹ 1000

Market value of bond P_0 = ₹ 850

Coupon rate r = 8%

Coupon amount C = 8% of ₹ 1000

                = 80

Consider the YTM rate as 7%

P_0 = 80 (PVIFA 7%, 9 yrs) + 1000 (PVII 7%, 9yrs)

The PVIF value is taken from present value interest factor table.

= 80 (6.515) + 1000 (0.544)

= 521.2 + 544

= 1065.2

Now, consider YTM rate as 6%

80 (PVIFA 6%, 9yrs) + 1000 (PVIF 6%, 9yrs)

= 80 (6.802) + 1000 (0.591)

= 544.16 + 591

= 1135.16

$$YTM = 6 + \frac{1135.16 - 850}{1135.16 - 1065.2} \times (1)$$

$$6 + \frac{285.16}{69.96}$$

$$6 + 4.0$$

$$\Rightarrow = 6.40\%$$

(b)   Brief on bond immunization with an example.   **(Unit - III, Q.No. 15)**

8.   (a)   What is Efficient Market Hypothesis? Explain its three variations with suitable examples.   **(Unit - IV, Q.No. 27)**

(b)   Discuss the free cash flow valuation aproaches.   **(Unit - IV, Q.No. 6)**

<div align="center">OR</div>

9.   Consider the following multiples of three comparable companies for Ashok Leyland Ltd. in the Automobile sector.

Multiple	M & M	Eicher	Escorts
P/E	12.54	27.67	32.13
P/BV	2.29	5.38	3.05
P/S	1.06	5.59	2.96

If EPS, BVPS and Sales per share of Ashok Leyland Ltd. are Rs. 4.23, Rs. 36.78 and Rs. 44.65 respectively, what is its value per share as per relative valuation approach?

Sol :

Step 1

First, calculate the average P/E multiple of the comparable companies :

$$\frac{12.54 + 27.67 + 32.13}{3} = 24.11$$

Step 2

Then, calculate the average P/BV multiple of the comparable companies :

$$\frac{2.29 + 5.38 + 3.05}{3} = 3.57$$

Step 3

Finally, calculate the average P/S multiple of the comparable companies :

$$\frac{1.06 + 5.59 + 2.96}{3} = 3.20$$

Step 4

Value per Share (P/E) = EPS × Average P/E = 4.23 × 24.11 = 101.98

Step 5

Value per Share (P/BV) = BVPS× Average P/BV 36.78 × 3.57 = 131.34

Step 6

Value per Share (P/S) = Sales per Share × Average P/S = 44.65 × 3.20 = 142.88

Step 7

Average the three valuations to find the final value per share :

$$\frac{101.98 + 131.34 + 142.88}{3} = 125.40$$

The value per share of Ashok Leyl nd Ltd. as per the relative valuation approach is Rs. 125.40

10. An investor wants to withdraw his investment from one of the following Four

   Mutual funds Advise him using the Sharpe and Treynor ratios.

Mutual Fund	Standard Deviation (SD)	Beta (B)	Risk free Return (Rf)	Return on Fund (Rp)
A	8	0.5	5%	15%
B	2	1.25	5%	12%
C	10	2.1	5%	8%
D	6	0.9	5%	10%

Ans :

Sharpe measures

$$S_P = \frac{r_p - r_f}{\sigma_p}$$

$$S_A = \frac{15 - 5}{8} = \frac{10}{8} = 1.25$$

$$S_B = \frac{12 - 5}{2} = \frac{7}{2} = 3.5$$

$$S_C = \frac{8 - 5}{10} = \frac{3}{10} = 0.3$$

$$S_D = \frac{10 - 5}{6}$$

$$= \frac{5}{6} = 0.8$$

Treynor measures

$$T_P = \frac{r_p - r_f}{\beta_P}$$

$$T_A = \frac{15 - 5}{0.5} = \frac{10}{0.5} = 20$$

$$T_B = \frac{12 - 5}{1.25} = \frac{7}{1.25} = 5.6$$

$$T_C = \frac{8 - 5}{2.1} = \frac{3}{2.1} = 1.43$$

$$T_D = \frac{10 - 5}{0.9} = \frac{5}{0.9} = 5.5$$

11. (a) Compare and contrast the Forward and Futures Markets.   **(Unit - V, Q.No. 18)**
    (b) Brief on trends in Indian mutual funds with suitable examples.   **(Unit - V, Q.No. 27)**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

MBA III - Semester Examinations

| R22 |

July / August - 2024

SECURITY ANALYSIS AND PORTFOLIO MANAGEMENT

Time : 3 Hours]   **[Max. Marks : 60]**

Note : This question paper contains two parts A and B. i) Part - A for 10 marks, ii) Part-B for 50 marks.

- Part-A is a compulsory question which consists of ten sub-questions from all units carrying equal marks.

- Part-B consists of ten questions (numbered from 2 to 11) carrying 10 marks each. From each unit, there are two questions and the student should answer one of them. Hence, the student should answer five questions from Part-B.

PART-A (10 Marks)

ANSWERS

1.   (a)   What is investment?   **(Unit - I, SQA-1**)

   (b)   Describe the concept of Margin trading.   **(Unit - I, SQA-8**)

   (c)   What is CAPM?   **(Unit - II, SQA-11**)

   (d)   Brief on Behavioral asset pricing models.

Ans :

  Behavioral asset pricing models incorporate insights from behavioral finance into traditional asset pricing frameworks. These models challenge the classical assumption that investors are fully rational and markets are always efficient.

(i)   **Behavioral Biases**

  Unlike traditional models which assume rational decision-making, behavioral asset pricing models account for biases such as overconfidence, loss aversion, and herding behavior. These biases can lead to deviations from expected utility maximization and affect asset prices.

(ii)   **Prospect Theory**

  This theory suggests that people value gains and losses differently, leading to inconsistent risk-taking behavior. For example, investors might avoid risk when they face potential gains but seek risk when facing potential losses.

   (e)   Illustrate the Yield to maturity.   **(Unit - III, SQA-1**)

   (f)   Describe the types of Bond   **(Unit - III, Q.No.4**)

   (g)   Brief on Dividend discount model.   **(Unit - IV, Q.No. 5**)

   (h)   What is market value?

Ans :

  In finance, the term "market value" refers to the current price at which an asset or company can be bought or sold in the open market.

(i)   Describe the types of derivatives.   **(Unit - V, Q.No. 1)**

(j)   Define the concept of Behavioral finance.

Ans :

Behavioral finance is a field of study that combines insights from psychology and economics to understand how cognitive biases and emotional factors influence investor behavior and financial markets. It challenges the traditional assumption of rational decision-making in classical finance theory, which posits that investors always act in their best interest based on complete information.

PART-B (50 Marks)

2.   (a)   Critically analyze the major challenges facing the Indian financial system today?

Ans :

The Indian financial system, which encompasses a broad range of financial institutions, markets, and instruments, faces several significant challenges. Here's a critical analysis of the major issues:

1.   Non-Performing Assets (NPAs)

Challenge

High levels of NPAs, particularly in public sector banks, have been a persistent problem. These are loans that borrowers have failed to repay, leading to financial stress for banks and impacting their profitability and lending capacity.

Analysis

(i)   Impact on Banks

NPAs reduce banks' ability to lend, which affects economic growth. They also increase the cost of capital for businesses.

(ii)   Regulatory Response

While the Insolvency and Bankruptcy Code (IBC) and other measures have been introduced to address NPAs, the resolution process can be slow and complex.

(iii)   Economic Impact

High NPAs can lead to tighter credit conditions, impacting both consumers and businesses, and potentially stifling economic growth.

2.   Financial Inclusion

Challenge

Despite progress, financial inclusion remains a significant issue, particularly in rural and under served areas. A large portion of the population still lacks access to formal banking services.

Analysis

(i)   Digital Divide

While digital banking has expanded access, technological barriers and low digital literacy in rural areas limit its effectiveness.

(ii) Policy Efforts

Initiatives like Jan Dhan Yojana have improved access, but there is still a need for better financial literacy and tailored financial products for under served segments.

(iii) Economic Impact

Limited financial inclusion can hinder economic participation and growth, particularly among marginalized populations.

3. **Regulatory and Compliance Issues**

    Challenge

    The Indian financial system faces complex regulatory requirements and frequent changes in compliance norms, which can be burdensome for financial institutions and businesses.

    Analysis

    (i) Regulatory Burden

    Frequent changes in regulations can create uncertainty and increase compliance costs for financial institutions.

    (ii) Innovation vs. Regulation

    Striking a balance between fostering innovation (e.g., fintech) and ensuring robust regulatory frameworks is challenging.

    (iii) Impact on Growth

    Overly stringent or poorly implemented regulations can stifle innovation and limit the growth potential of financial services.

4. **Systemic Risk and Financial Stability**

    Challenge

    The financial system is susceptible to systemic risks, including those arising from inter connectedness between financial institutions and market volatility.

    Analysis

    (i) Market Volatility

    Financial markets can be volatile due to both domestic and global factors, impacting investor confidence and financial stability.

    (ii) Institutional Risks

    Large financial institutions and their inter connected ness mean that problems in one institution can spread to others.

    (iii) Regulatory Measures

    While the Reserve Bank of India (RBI) and other regulators have taken steps to mitigate systemic risk, monitoring and managing these risks remains an ongoing challenge.

5.   Corporate Governance and Fraud

Challenge

Issues related to corporate governance and financial fraud have impacted investor confidence and the integrity of financial markets.

Analysis

(i)   High-Profile Cases

Scandals involving prominent companies and financial institutions have highlighted gaps in corporate governance and oversight.

(ii)   Regulatory Response

Measures such as stricter reporting requirements and improved auditing standards have been introduced, but enforcement and adherence remain key concerns.

(iii) Impact on Investment

Perceptions of weak governance can deter both domestic and foreign investors, affecting market performance and capital inflows.

(b)   Examine the roles of SEBI in Indian stock market.   **(Unit - I, Q.No. 22**)

3.   (a)   Analyze the various investment avenues available in the financial markets.   **(Unit - I, Q.No. 12**)

(b)   Describe the scenario of Indian security market.

Ans :

The Indian securities market is a vital component of the country's financial system, encompassing equity, debt, and derivatives markets. It plays a crucial role in capital formation, investment, and economic growth. Here's an overview of the current scenario in the Indian securities market:

1.   Equity Market

Structure and Participants:

(i)   Exchanges

The major stock exchanges in India are the Bombay Stock Exchange (BSE) and the National Stock Exchange (NSE). Both exchanges offer a platform for trading equities, derivatives, and other financial instruments.

(ii)   Listed Companies

India has a diverse set of listed companies across various sectors, with a mix of large-cap, mid-cap, and small-cap stocks.

(iii) Institutional Investors

Institutional investors, including mutual funds, insurance companies, and foreign institutional investors (FIIs), play a significant role in the equity market.

Current Trends

(i)   Market Performance

The Indian equity market has experienced periods of volatility but generally shows long-term growth trends. Key indices like the Nifty 50 and Sensex are barometers of market performance.

(ii)   IPO Activity

There has been significant activity in initial public offerings (IPOs), with numerous companies going public to raise capital. The IPO market reflects investor appetite and market sentiment.

Challenges

(i)   Volatility

Market volatility can be influenced by domestic economic conditions, global geopolitical events, and changes in investor sentiment.

(ii)   Regulatory Changes

Regulatory reforms and policy changes can impact market dynamics and investor behavior.

2.   Debt Market

Structure and Participants

(i)   Government Securities

The government securities market includes bonds issued by the central and state governments, which are used to finance public spending and manage fiscal deficits.

(ii)   Corporate Bonds

Corporates issue bonds to raise capital. The corporate bond market is less developed compared to the equity market but is growing.

Current Trends:

(i)   Interest Rates

The debt market is sensitive to changes in interest rates, which are influenced by monetary policy decisions of the Reserve Bank of India (RBI).

(ii)   Liquidity

Liquidity in the corporate bond market can be lower compared to government securities, affecting trading volumes and price discovery.

Challenges:

(i)   Market Depth

The corporate bond market lacks depth and liquidity compared to government securities, which can impact pricing and investor participation.

(ii)   Credit Risk

Investors face credit risk related to the creditworthiness of issuers, which requires effective credit assessment and risk management.

3.   Derivatives Market

Structure and Participants:

(i)   Products

The derivatives market includes futures and options on equities, indices, currencies, and commodities. These instruments are used for hedging, speculation, and arbitrage.

(ii)   Exchanges: Both the NSE and BSE offer derivatives trading platforms.

Current Trends:

(i)   Growth

The derivatives market has grown significantly, with increased participation from both institutional and retail investors.

(ii)   Innovation

New products and strategies continue to emerge, enhancing the market's sophistication and depth.

Challenges:

(i)   Complexity

Derivatives can be complex and require a high level of understanding from investors to manage risks effectively.

(ii)   Regulatory Oversight

Ensuring robust regulation and monitoring to prevent excessive speculation and market manipulation is crucial.

4.   Regulatory Environment

Key Regulator:

(i)   Securities and Exchange Board of India (SEBI)

SEBI is the primary regulator overseeing the securities market. It formulates regulations, supervises market participants, and ensures investor protection.

Current Developments:

(i)   Reforms

SEBI has introduced various reforms to enhance market transparency, governance, and investor protection. This includes measures to improve corporate disclosures, reduce insider trading, and enhance market efficiency.

Challenges:

(i)   Compliance Costs

Regulatory requirements can impose significant compliance costs on market participants, particularly smaller firms.

(ii)   Regulatory Adaptation

Keeping pace with rapid market developments and technological advancements requires continuous adaptation and updating of regulations.

5.   Market Sentiment and Economic Impact

Investor Sentiment:

(i)   Domestic Factors

Factors such as economic growth, inflation, and political stability influence investor sentiment and market performance.

(ii)   Global Factors

Global economic conditions, geopolitical events, and international trade dynamics also affect market sentiment and capital flows.

Economic Impact:

(i)   Capital Formation

The securities market facilitates capital formation by providing a platform for raising funds through equity and debt issuance.

(ii)   Economic Growth

A well-functioning securities market contributes to economic growth by enabling efficient allocation of resources and investment.

4.   (a)   Discuss the evolution of Modern Portfolio Theory.

Ans :

Modern Portfolio Theory (MPT) has significantly evolved since its inception, shaping how investors and financial professionals approach portfolio construction and risk management. Here's a detailed discussion of its evolution:

1.   Foundations of Modern Portfolio Theory

(a)   Early Concepts and Background

(i)   Pre-MPT Era

Before MPT, investment decisions were primarily based on individual securities rather than the overall portfolio. Investors focused on selecting stocks with strong fundamentals without considering how they interacted in a portfolio.

(ii)   Diversification

The concept of diversification was understood but not formalized in terms of risk and return trade-offs.

(b)   Harry Markowitz's Contribution (1952)

(i)   Key Work

Harry Markowitz's seminal paper, "Portfolio Selection" (1952), introduced the formal framework for MPT. Markowitz proposed that investors should consider not just the expected returns of individual assets but also their correlations with other assets.

(ii)   Efficient Frontier

He introduced the concept of the efficient frontier, which represents the set of optimal portfolios that offer the highest expected return for a given level of risk or the lowest risk for a given level of return.

(iii)   Mean-Variance Optimization

Markowitz's model is based on mean-variance optimization, where investors choose portfolios to maximize returns for a given level of risk or minimize risk for a given level of return.

2.   Development and Expansion

(a)   Capital Asset Pricing Model (CAPM)

(i)   Introduction

In the 1960s, William Sharpe, along with John Lintner and Jan Mossin, developed the Capital Asset Pricing Model (CAPM), which expanded MPT by incorporating market equilibrium and systematic risk.

(ii)   Beta

CAPM introduced the concept of beta, which measures an asset's sensitivity to market movements and helps in assessing its risk-adjusted return relative to the market.

(iii)   Security Market Line (SML)

CAPM introduced the Security Market Line, which represents the relationship between expected return and beta for individual securities.

(b)   Arbitrage Pricing Theory (APT)

(i)   Introduction

In the 1970s, Stephen Ross developed Arbitrage Pricing Theory (APT) as an alternative to CAPM. APT is based on the idea that asset returns can be explained by multiple factors rather than a single market factor.

(ii)   Factors

APT does not specify the exact factors but allows for a flexible model where various macroeconomic and financial factors can influence asset returns.

3.   Advancements and Criticisms

(a)   Behavioral Finance

(i)   Introduction

In the late 20th and early 21st centuries, behavioral finance emerged, challenging some assumptions of MPT. Behavioral finance incorporates psychological factors and biases that affect investor behavior, which MPT's rational assumptions do not account for.

(ii)   Key Insights

Research by psychologists like Daniel Kahneman and Amos Tversky showed that investors are often irrational, influenced by biases like overconfidence, loss aversion, and herding behavior.

(b) Post-Modern Portfolio Theory (PMPT)

(i) Introduction

PMPT, developed in the 1990s, extends MPT by incorporating downside risk rather than just variance. It focuses on managing downside risk and skewness in returns.

(ii) Value at Risk (VaR)

PMPT and other post-modern approaches often use metrics like Value at Risk to evaluate the potential for extreme losses, addressing some limitations of traditional MPT.

(c) Black-Litterman Model

(i) Introduction

Developed by Fischer Black and Robert Litterman, this model improves on MPT by incorporating subjective views of investors along with market equilibrium. It provides a more flexible approach to portfolio optimization and can adjust for differing opinions about market returns.

(b)   Illustrate the capital asset pricing model.   **(Unit - II, Q.No. 15)**

OR

5.   Asset A : Expected return = 10%, Standard deviation = 15%.

Asset B : Expected return = 8%, Standard deviation = 10%. Correlation : 0.5

The weight of a portfolio with 60% invested in Asset A and 40% invested in Asset B.

Calculate the expected return, variance and standard deviation of the portfolio.

Sol :

Asset A :

Expected return (RA) = 10%

Standard deviation (σA) = 15%

Asset B :

Expected return (RB) = 8%

Standard deviation (σB) = 10%

Correlation (ρ AB) = 0.5

Weight of Asset A (wA) = 60% = 0.6

Weight Asset B(wB) = 40% = 0.4

Step 1 : Calculate the Expected Return of the Portfolio

E(Rp) = wA × RA + wB × RB

E(Rp) = 0.6 × 10% + 0.4 × 8%

E(Rp) = 6% + 3.2% = 9.2%

Step2 : Calculate the Variance of the Portfolio

Var (Rp) = wA² × σA² + wB² × σB² + 2 × wA × wB × ρ AB × σA ×σB

Var (Rp) = (0.6² × 0.15)² + (0.4² × 0.10²) + (2 × 0.6 × 0.4 × 0.5 × 0.15 × 0.10)

Var (Rp) = (0.36 × 0.0225) + (0.16 × 0.01) + (0.48 × 0.5 ×0.015)

Var (Rp) = 0.0081 + 0.0016 + 0.0036

Var (Rp) = 0.0133 or 1.33%

Step 3 : Calculate the Standard Deviation of the Portfolio

$\sigma p = \sqrt{Var(RP)}$

$\sigma p = \sqrt{0.0133}$

σp = 0.1153 or 11.53%

6.   (a)   A 5-year bond with a face value of $ 1,000 pays an annual coupon of $50.

         If the bond is currently priced at $950, what is its Yield to Maturity (YTM)?

Sol :

Face value = $ 1000

Coupon amount = $ 50

Current price = $ 950

$$YTM = \frac{Coupon\ amount}{Price} \times 100$$

$$= \frac{50}{950} \times 100$$

$$= 5.26\%$$

   (b)   Brief on classification of fixed income securities.   **(Unit - III, Q.No. 1)**

7.   (a)   Discuss the various methods used to measure the return on fixed - income

         securities.   **(Unit - III, Q.No. 9)**

   (b)   Brief on the concepts of Bond Volatility and Bond Convexity.   **(Unit - III, Q.No. 16, 17)**

8.   (a)   DEF Corp. is expected to pay a dividend of $3 next year. The dividend

         growth rate is expected to 8% for the next 3 years and then settle at 4%

         indefinitely. If the required rate of return is 9%, what is the intrinsic value

         of DEF Corp.'s stock?

Sol :

The intrinsic value of DEF Corp.'s stock, a two-stage dividend discount model (DDM), the value of dividends during the high-growth phase and the value of dividends after the growth rate stabilizes.

1.   Dividends for the next 3 years

Dividend in Year 1 (D_1)

$D_1 = 3$

Dividend in Year 2 (D_2) :

$D_2 = D_1 \times (1 + g_1) = 3 \times (1 + 0.08) = 3.24$

Dividend in Year 3 (D_3) :

$D_3 = D_2 \times (1 + g_1) = 3.24 \times (1 + 0.08) = 3.50$

2.   Calculate the terminal value at Year 3

After Year 3, the dividend growth rate will stabilize at 4%. The terminal value (TV) at the end of Year 3 is calculated the Gordon Growth Model:

$$TV = \frac{D_4}{r - g_2}$$

Where $D_4 = D_3 \times (1 + g_2) = 3.50 \times (1 + 0.04) = 3.64$,

$r = 0.09$,

and $g_2 = 0.04$

$$TV = \frac{3.64}{0.09 - 0.04} = \frac{3.64}{0.05} = 72.80$$

3.   The present value of dividends and the terminal value to discount each dividend and the terminal value to the present the required rate of return (9%).

Present value of D_1 :

$$PV\ (D_1) = \frac{3}{(1 + 0.09)^1} = \frac{3}{1.09} = 2.75$$

Present value of D_2 :

$$PV(D_2) = \frac{3.24}{(1 + 0.09)^2} = \frac{3.24}{1.1881} = 2.73$$

Present value of D_3 :

$$PV(D_3) = \frac{3.50}{(1+0.09)^3} = \frac{3.50}{1.2950} = 2.70$$

Present value of terminal value

$$PV(TV) = \frac{72.80}{(1+0.09)^3} = \frac{72.80}{1.2950} = 56.23$$

4.   The intrinsic value of the stock

The intrinsic value is the present values of the dividends and the terminal value

Intrinsic value = 2.75 + 2.73 + 2.70 + 56.23 = 64.41

(b)   Brief on relative valuation techniques.   **(Unit - IV, Q.No. 7, 8, 9, 10)**

OR

9.   Identify the key components of fundamental analysis and brief on efficient market

hypothesis.   **(Unit - IV, Q.No. 12, 13, 15, 27)**

10.   (a)   Discuss various hedging strategies in different market conditions.

Ans :

Hedging strategies can vary significantly depending on market conditions, risk tolerance, and the specific assets involved. Here are some common strategies tailored to different scenarios:

1.   Bull Market Conditions

In a bullish environment where prices are rising, investors may want to protect their gains while still allowing for further upside.

(i)   Call Options

Buying call options can provide leverage while limiting potential losses.

(ii)   Protective Puts

Holding a long position and purchasing put options can protect against sudden downturns.

(iii)   Bull Spreads

Using bull call spreads (buying a call at a lower strike and selling another at a higher strike) can maximize gains while capping risk.

2.   Bear Market Conditions

In a bearish market, the focus shifts to preserving capital and minimizing losses.

(i)   Put Options

Purchasing put options allows investors to profit from declining asset prices.

(ii)   Short Selling

Selling assets short can hedge against declines in long positions.

(iii)   Inverse ETFs

Investing in inverse exchange-traded funds that rise when the market falls can provide a hedge.

3.   Sideways Market Conditions

In stagnant markets where prices do not show a clear direction, strategies that capitalize on volatility can be effective.

(i)   Straddles and Strangles

Buying both call and put options (straddles) or options at different strike prices (strangles) can profit from large price swings.

(ii)   Iron Condors

This strategy involves selling a call spread and a put spread, benefiting from low volatility and limited movement in the underlying asset.

4.   High Volatility Conditions

When market volatility spikes, protecting against price swings becomes crucial.

(i)   VIX Options or Futures

Trading volatility indices can hedge against sudden market movements.

(ii)   Dynamic Hedging

Adjusting hedge positions frequently based on volatility measures (like the VIX) can help manage risk effectively.

(iii)   Collars

Combining protective puts and covered calls can provide downside protection while still allowing for some upside.

5.   Low Volatility Conditions

In periods of low volatility, hedging strategies may focus on income generation.

(i)   Sell Covered Calls

Generating income by selling call options on owned stocks can provide some downside protection.

(ii)   Cash-Secured Puts

Selling put options can generate premium income while setting up potential stock purchases at a lower price.

(b)   Brief on an overview of Indian derivatives market.   **(Unit - V, Q.No. 2)**

11.   Portfolio A has an expected return of 15%, a beta of 1.5, and the risk-free rate is 3%.

Portfolio B has an expected return of 10%, a beta of 1.0, and the risk-free rate is 3%.

Which portfolio has a better performance according to the Treynor Ratio.

Sol :

Treynor Ratio

$$T_P = \frac{r_p - r_f}{\beta_P}$$

A = r_p = 15%,

β_P = 1.5%,

r_f = 3%

$$= \frac{15 - 3}{1.5} = \frac{12}{1.5} = 8$$

B = r_p = 10%,

β = 1.0,

r_f = 3%

$$= \frac{10 - 3}{1.0} = \frac{7}{1.0} = 7$$