NISM CERTIFICATION EXAMINATION WORK BOOK ★ XXI-B

Portfolio Managers



National Institute of Securities Markets
A Capacity Building Initiative of SEBI

Workbook for

NISM-Series-XXI-B: Portfolio Managers Certification Examination



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This workbook has been developed to assist candidates in preparing for the National Institute of Securities Markets (NISM) Certification Examination for Portfolio Managers.

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[1] The updates made in the workbook (version: Sep 2025) have been highlighted in YELLOW colour for easy identification. Kindly refer to the workbook (version: Sep 2025) for appearing in the Series XXI-B Certification Examination on or after Oct 10, 2025

Foreword

National Institute of Securities Market (NISM) is a leading provider of high-end professional education, certifications, training and research in financial markets. NISM engages in capacity building among stakeholders in the securities markets, through professional education, financial literacy, enhancing governance standards and fostering policy research.

The NISM certification programs aim at enhancing the quality and standards of professionals employed in various segments of the financial sector. NISM develops and conducts certification examinations and Continuing Professional Education (CPE) programs that aim at ensuring that professionals meet the defined minimum common knowledge benchmark for various critical securities market functions.

NISM certification examinations and educational programs service different securities market intermediaries focusing on varied product lines and functional areas. NISM certifications have established knowledge benchmarks for various market products and functions such as equities, mutual funds, derivatives, compliance, operations, advisory and research. NISM certification examinations and training programs provide a structured learning plan and career path to students and job aspirants, wishing to make a professional career in the securities markets.

NISM supports candidates by providing lucid and focused workbooks that assist them in understanding the subject and preparing for NISM Examinations. The book covers about basics of investments, securities markets, investing in stocks, fixed income securities, derivatives and mutual funds. This book also provides an understanding about the role of portfolio managers, operational aspects of portfolio management services, the portfolio management process, performance measurement and evaluation of portfolio managers. The taxation, regulatory, governance and ethical aspects of portfolio managers have also been discussed in this workbook.

Sashi Krishnan
Director, NISM

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While the NISM Certification examination will be largely based on material in this workbook, NISM does not guarantee that all questions in the examination will be from material covered herein.

Acknowledgement

This workbook has been developed jointly by the Certification Team of National Institute of Securities Markets (NISM), Dr. Rachana Baid, Professor, NISM and reviewed by Dr. Kishore Rathi, Subject matter expert, NISM and Dr. Kameshwar Rao, Subject matter expert, NISM. This book draws references from various NISM certification examinations workbooks and NISM acknowledges the contribution of those NISM Resource Persons.

NISM gratefully acknowledges the contribution of the Examination Committee for NISM-Series-XXI-B: Portfolio Managers Certification Examination consisting of industry experts.

About NISM Certifications

National Institute of Securities Markets (NISM) is a capacity building initiative of Securities and Exchange Board of India (SEBI), the securities market regulator. The Institute was established in 2006 pursuant to the Union Budget of 2005-06.

NISM is engaged in developing and administering Certification Examinations and Continuing Professional Education (CPE) Programmes for professionals employed in various segments of the Indian securities markets. These Certifications and CPE Programmes are being developed and administered by NISM as mandated under Securities and Exchange Board of India (Certification of Associated Persons in the Securities Markets) Regulations, 2007.

The skills, expertise and ethics of professionals in the securities markets are crucial in providing effective intermediation to investors and in increasing the investor confidence in market systems and processes. NISM seeks to ensure that market intermediaries meet defined minimum common benchmark of required functional knowledge through Certification Examinations and CPE Programmes on Mutual Funds, Equities, Derivatives, Securities Operations, Compliance, Portfolio Management etc.

These Certifications create quality market professionals and catalyzes greater investor participation in the markets. They also provide structured career paths to students and job aspirants in the securities markets.

About the Examination:

The NISM-Series-XXI-B: Portfolio Managers Certification Examination seeks to create a common minimum knowledge benchmark for principal officers and other employees of the Portfolio Management Services (PMS) firms. The exam aims to enhance the quality of Portfolio Management Services.

Examination Objectives

On successful completion of the examination, the candidate should:

- Know the basics of investments, securities markets, investing in stocks, understanding fixed income securities, derivatives and mutual funds.
- Understand about indices, concept of information efficiency, behavioural finance, modern portfolio theory, equity and fixed income portfolio management strategies.
- Understand the role of portfolio managers, operational aspects of portfolio management services and about the portfolio management process, performance measurement and evaluation of portfolio managers.
- Get oriented to the taxation aspects and regulatory, governance and ethical aspects of portfolio managers.

Assessment Structure

The examination consists of 90 independent multiple choice questions and 6 caselets with 5 questions in each caselet. The assessment structure is as follows:

Multiple Choice Questions [90 questions of 1 mark each]	90*1 = 90 marks
6 Case-based Questions [6 cases (each case with 5 questions of 2 mark each)]	6*5*2 = 60 marks
Total	150 marks

The examination should be completed in 3 hours. The passing score for the examination is 60 percent which is 90 marks out of the total 150 marks. There shall be negative marking of 25 percent of the marks assigned to a question.

How to register and take the examination

To find out more and register for the examination please visit *www.nism.ac.in*

Important

- Please note that the Test Centre workstations are equipped with either Microsoft Excel or OpenOffice Calc. Therefore, candidates are advised to be well versed with both of these softwares for computation of numericals.
- The sample caselets and multiple choice questions illustrated in the book are for reference purposes only. The level of difficulty may vary in the actual examination.

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SYLLABUS OUTLINE AND WEIGHTAGES

NISM Series XXI-B: Portfolio Managers Certification Examination		
Units	**Name of Units**	**Marks**
1	Investment Landscape	3
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3	Investing in Stocks	5
4	Investing in Fixed Income Securities	5
5	Derivatives	5
6	Mutual Funds	5
7	Role of Portfolio Managers	10
8	Operational Aspects of Portfolio Managers	10
9	Portfolio Management Process	10
10	Taxation	5
11	Regulatory, Governance and Ethical Aspects of Portfolio Managers	10
12	Introduction to Indices	5
13	Concept of informational Efficiency	5
14	Behavioural Finance	5
15	Introduction to Modern Portfolio Theory	5
16	Introduction to Capital Market Theory	5
17	Risk	10
18	Equity Portfolio Management Strategies	15
19	Fixed Income Portfolio Management Strategies	15
20	Performance Measurement and Evaluation of Portfolio Managers	10
21	Portfolio Rebalancing	5
	Total Marks	**150**

CHAPTER 1: INVESTMENTS

LEARNING OBJECTIVES:

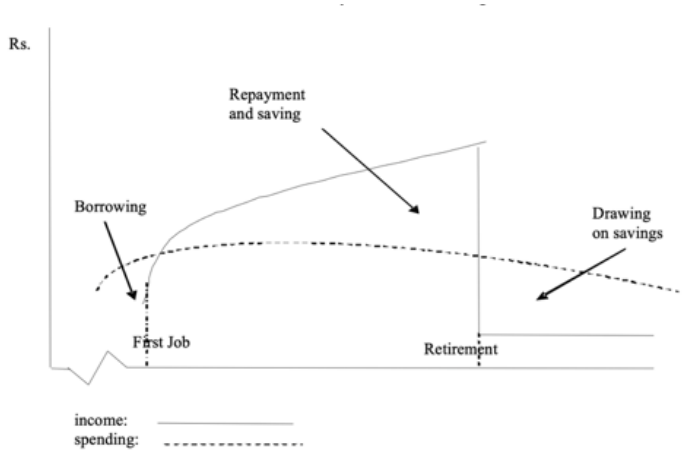
After studying this chapter, you should understand about:

- Meaning of Investments
- Difference between saving and investment
- Difference between investment and speculation
- Objectives of investments
- Components of required rate of return
- Relationship between risk and return
- Types of risks
- Types of investment opportunities

1.1 What is Investment?

People earn money and spend money. They pass through various phases in their life cycle. During some phases, they earn more money than they spend. In other phases, they earn less than they spend. Therefore, sometimes they have to borrow money to meet the shortfall and in other times they end up having surplus money. As can be seen in Exhibit 1.1, rarely the income and spending of individuals or households match.

Exhibit 1.1: The Life-Cycle Pattern of Savings for Households



People have, broadly, two options to utilise their savings. They can either keep it with them until their consumption requirements exceed their income, or, they can pass on their saving to those whose requirements exceed their income with the condition of returning it back with some increment. Therefore, those who consume more than their current income must be willing to repay more than what they received, to those who have provided the funds.

Essentially, people make a trade-off between postponing their current consumption, and an expected higher amount for future consumption. The difference between the two is referred as return.

1.1.1 Saving versus Investment

It is common to use the terms Savings and Investment interchangeably. However, they are not one and the same. Saving is just the difference between money earned and money spent. Investment is the current commitment of savings with an expectation of receiving a higher amount of committed savings. Investment involves some specific time period. It is the process of making the savings work to generate return.

Hence when people are saving, they use the short-term deposits/short-term securities which are highly liquid assets- on the other hand when people are investing they commit funds to real assets, capital market securities such as stocks and bonds, and other long-term commitments that may not be as liquid as short-term assets. See Box 1.1 to understand the difference between Financial and Real assets. Secondly, the objectives of savers and investors are different. Savers tend to accumulate funds to address short-term goals, whereas investors have longer-term goals, such as building retirement corpus or funding children's college education expenses. Those who save funds have the choice of investing. Hence, every investor is a saver but not vice versa.

Box 1.1: Financial Assets versus Real Assets

Assets can broadly be categorised as ***financial assets*** such as shares, debentures, bank deposits, public provident fund, mutual fund investments and others, and ***physical assets (tangible assets)*** such as gold, diamonds, other precious metals and real estate. Financial assets have the advantage of greater liquidity, flexibility, convenience of investing and ease of maintaining the investments. They are primarily income generating investments, though some of them, such as equity-oriented investments are held for long-term capital appreciation. There is greater ease of investing in such assets as it allows for small and frequent investments.

1.2 Investment versus Speculation

Another term which needs to be distinguished from “Investment” is “Speculation”. Investment and speculation activities are so intermingled that it is very difficult to distinguish and separate them. An attempt can be made to distinguish between speculation and

investment on the basis of criteria like investment time horizon and the process of decision making.

Financial transactions occur on a time continuum ranging micro milli-second, micro-second, second, minute, hour, day, week, month, year, decade, century and perpetual time period. There is a tendency to describe short-term activities as speculative in nature and long-term ownership of assets as investments, which is not appropriate.

Another popular way to define speculation is by extending the dictionary meaning of the same. Dictionary meaning of the term speculation is "the forming of a theory or conjecture without firm evidence". The activity of investment involves carrying out any exercise or process to determine the value of the asset and then buying the one whose value is determined to be higher than the current market price. However, while speculating, one is motivated to undertake risk which is not commensurate with the return, in anticipation of gaining higher returns, with minimum research and analysis on the true value of the asset.

1.3 Investment Objectives

Most of the investors invest with a goal in mind, regarding the value of the investment at the end of the investment period. Investment objectives are investors' goals expressed in terms of risk, return and liquidity preferences. Some investors may have the tendency to express their goals solely on the basis of return. They must be encouraged to state their goals in terms of both risk and return, as expressing goals only in terms of return may lead to inappropriate asset allocation and adoption of risky investment strategies. Given to themselves, an investor may want her wealth to double up by the end of the year. However, she must be made to understand that such a goal would entail excessive risk. The investor must be explained that the "risk leads return" and not the other way around. Hence a detailed analysis of the risk appetite of the investor i.e. her willingness and ability to take the risk should proceed any discussion of the desired return.

The return objective may be simplified as follows:

1.3.1 Capital Preservation means minimizing or avoiding the chances of erosion in the principal amount of investment. Highly risk averse investors pursue this investment goal, as this investment objective requires no or minimal risk taking. Also, when funds are required for immediate short term, investors may state for capital preservation as the investment objective.

1.3.2 Capital Appreciation is an appropriate investment objective for those who want their portfolio value to grow over a period of time and are prepared to take risks. This may be an appropriate investment objective for long term investors.

1.3.3. Current Income is an investment objective pursued when investor wants her portfolio to generate income at regular interval by way of dividend, interest, rental income rather than appreciation in the value of the portfolio. This investment objective is mostly pursued by people who are retired and want their portfolios to generate income to meet their living expenses.

1.3.4. Tax Saving: Sometimes investors do invest in some select investment alternatives, to reduce their tax burden. This is because the IT authorities provide tax benefits in terms of deductions from taxable income, or as tax rebate from the tax payable.

1.4 Estimating the required rate of return

Investment is the commitment of rupee for a period of time to earn a) pure time value of money – for investors who postpone their current consumption b) compensation for expected inflation during the period of investment for the change in the general price levels and c) risk premium for the uncertainty of future payments.

The price paid for the exchange between current and future consumption is the pure rate of interest. If an investor postpones consumption worth Rs. 1000 today for a guaranteed future consumption worth Rs. 1020 then the pure rate of interest in this exchange is 2%. ((1020-1000)/1000).

It is the rate of return, the investor demands even if there is no inflation and no uncertainty associated with future payments. In reality, prices level rarely remains the same. Hence, if the investor expects a rise in the price level, they will require an additional return to compensate for it. Further, if there is a risk associated with future payment, investor will demand compensation for bearing the risk.

The compensation for postponement of consumption is the pure time value of money. It is referred as real risk-free rate. Real risk-free rate when adjusted for inflation expectation is referred as nominal risk-free rate. Nominal risk-free rate plus risk premium is required rate of return.

Required rate of return is the minimum rate of return investors expect when making investment decisions. It is to be noted that required rate of return is not guaranteed return or assured return. It is also different from expected or forecasted return. It is also different from realized return.

1.4.1 Nominal risk-free rate, real risk-free rate, and expected inflation

The notion that money has time value is a fundamental concept in investments. It is the central theme in calculating the rate of return. It is better to receive a sum of money today than to receive the same sum tomorrow because it can be invested today and earn returns for tomorrow. Investors can invest in investment opportunities like risk-free bonds, where they are promised to receive an amount more than the amount they have invested.[2] For example if an investor invests Rs.100 today at a risk free rate of 5% per year, the value of this investment at the end of one year will be Rs.100 + (Rs.100*5%)=Rs. 105. Thus, Rs.105 is the future value of this current investment, one year from now. The value today is its present value. i.e. Rs.100. Conversely, if an investor is certain of receiving Rs.105, one year from today, then its present value can be calculated as Rs.105/(1+5%)=Rs.100. These calculations substantiate an old age saying that "a dollar today is worth more than a dollar tomorrow", or one needs more money to buy something tomorrow, than what it needs today.

The certainty of receiving the amount in future makes it a risk free investment. And the rate of return on the same is called a risk-free rate. In this case it is 5%. This risk-free rate is also referred as nominal rate of return. As can be seen, it ignores the potential change in the purchasing power of rupee. That is, though the investor is certain of receiving Rs.105 after one year, there is no guarantee that rupee will have the same purchasing power a year from now that it has today. From the nominal rate, inflation rate can be subtracted to calculate the real rate of return.

Hence Nominal Rate of Return(NRR) can be decomposed into: real rate of return and inflation rate.

Real risk free rate is the basic rate of return or interest rate, assuming no inflation and no uncertainty about future cashflows. It is the compensation paid for postponing the consumption.

For example, an investor gives up Rs. 100 today for more than Rs. 100 say Rs. 102 one year from today. If this is a risk-free investment and the real risk-free rate of interest is 2% ((102/100) – 1). The desire for current consumption influences this rate. The desire for current consumption is influenced by the investment opportunities available in the economy. The availability of investment opportunities is determined by the real growth rate of the economy. Hence, the real risk free rate is determined by an interaction between subjective factors like the desire for consumption and objective factors like the available investment opportunities and the growth rate of the economy.

[2] An investment avenue where there is certainty of receiving the promised amount in future. Example of risk-free investment is treasury (government) bond.

As noted above, if investors expect the price level to rise during the period of investment, they would require a compensation for the expected rate of inflation. Continuing with the above example, "What if the price level in the economy increases by 6%?" In such situation, the investors should increase the required rate of return by the expected rate of inflation. If they do not do so, then they would be losing money in the real sense rather than getting a real rate of return. To maintain a consumption of Rs.102, the interest earned must be 8.12 per cent. The required NRR would be as follows:

NRR = [(1+Real rate of return) x (1+Expected rate of inflation)] – 1

8.12% = [(1+ 2%) X (1+6%)] -1

Thus, 8.12% rate of return is required in place of 2%. This rate of interest (comprising real rate of return plus the compensation for inflation compensation) is called the nominal rate of return. It is also considered as the nominal risk-free rate of return.

1.4.2 Risk Premium

As discussed above, the nominal risk-free rate of return is the rate of return, an investor is certain of receiving on the due date. Investor is certain of the amount as well as the timing of the return. Hence, it is the risk-free rate of return. Some investment opportunities such as government securities (with some caveats) fit this pattern. The returns from most of the investment opportunities do not have certainty of the amount and the timing of cashflows. Further, the uncertainty of receiving the future cashflows vary amongst investments. In such cases, investors would require compensation for the uncertainty associated with future cashflows. This additional compensation over the nominal risk-free rate is called risk premium. If the investors perceive higher risk (more uncertainty with respect to the future payment), they would demand higher risk premium.

1.4.3 Types of risks

Risk is usually understood as "exposure to a danger or hazard", however it is not exposure to danger, rather the variability in impact when exposed to a danger. In investment, risk is defined as the possibility that the actual earnings could be different from what is expected to be earned. In more technical terms, the dispersion around the average expected return is defined as risk.

Similarly, people use risk and uncertainty interchangeably. This also is not correct. Risk is not uncertainty. When one does not have any knowledge about the future variability in the expected outcomes or their causal factors, then such a situation is known as "uncertainty". However, when there is some existing or developing theoretical or empirical knowledge about the factors leading to uncertainty, then such situation is considered as "risk". In summary, Risk is known uncertainty. As research evidence or scientific advancements

progress towards more clarity on the causal factors leading to some phenomena or event, then everyone begins to term that phenomenon as risk and no more uncertainty. There are various types of risk viz., business risk, financial risk, liquidity risk, political risk, exchange rate risk etc..

1.4.3.1 Business risk

Variability of income flows caused by the nature of a firm's business, is defined as business risk. Sales volatility and operating leverage determines the level of business risk. For example, an auto manufacturer incurs high operating costs viz-a-viz a retail food company. Earnings and sales of the auto manufacturer fluctuates substantially over the business cycle leading to high business risk.

1.4.3.2 Financial risk

Financial risk relates to the means of financing the assets with either debt or equity. When a firm borrows, it is required to make fixed payments to be paid ahead of payments to stockholders. Thus, the use of debt increases the volatility of stockholder's income. This increase in volatility because of use of fixed cost financing alternatives is referred to financial risk and also popularly known as financial leverage.

1.4.3.3 Liquidity risk

Liquidity has multiple connotations in the realm of finance. One such connotation is the ease of converting an asset into an amount of cash, nearer to its economic worth. The more difficult the conversion, the more is the liquidity risk. Liquidity risk is the uncertainty introduced by the secondary market of an investment. Treasury bills have almost no liquidity risk. They can be sold in a fraction of minute at a price worth their economic value. On the other hand, a piece of art may take longer to get converted into cash and the price may deviate significantly from its worth.

1.4.3.4 Exchange rate risk

Exchange rate risk is the volatility of return introduced by acquiring investments denominated in a currency different from that of the investor. Changes in exchange rates affect the investors return when converting an investment back into the "home" currency. As more and more investors want to reap the benefits of a globally diversified portfolio, this risk increases. As an example, suppose that an Indian investor purchases a dollar denominated bond. On such bond, interest will be paid in dollar. If the rupee has appreciated in value compared to USD, when the interest is received in dollar and converted into rupee, the investor will receive less in rupee than expected. The risk in this entire episode is arising due to the unpredictability of volatile and uncontrollable currency exchange rates.

1.4.3.5 Political Risk

Political risk is the volatility of returns caused by the possibility of a major change in the political or economic environment in a country. Individuals who invest in countries that have unstable political-economic systems must include an additional country risk-premium when determining their required rate of return.

1.4.3.6 Geopolitical Risk

Geopolitics is influence of geography and politics on the social and economic relationships between countries. Geopolitical risk is the risk associated with wars, terrorist acts, and tensions between states that affect the normal and peaceful course of international relations. An example of geopolitical risk could include a flare-up of tensions between China and USA and how it has impacted the global trade and economy. Another example is the border tensions between India and China that escalated in May 2020.

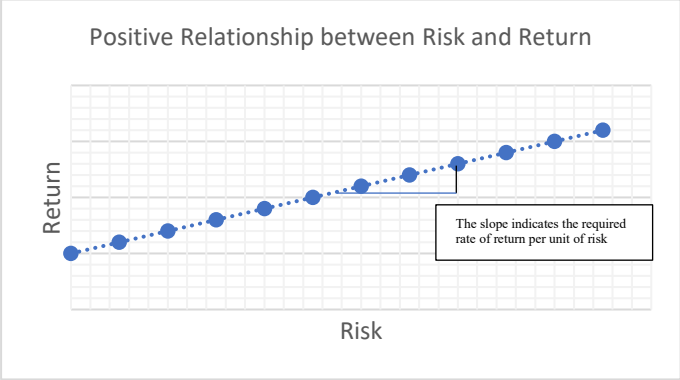
1.4.3.7 Regulatory risk

Regulatory risk is the risk associated with unpredictability about the regulatory framework pertaining to investments. It is the risk that existing regulations will become more stringent leading to higher transaction costs. Regulatory risk is higher in new investment opportunities and products than the matured and established ones.

1.4.4 Relationship between risk and return

Exhibit 1.1 plots the usual relationship between risk and return. A positive relationship exists between risk and return. The greater the risk, the higher the return. The graph demonstrates that investors increase their required rate of return as their expectation about future volatility of returns increases. As a result the risk premium goes up. The graph is just to convey the meaning of a positive relationship, however, in reality, the relationship between risk return is nonlinear, that is there is no proportionate increase in return for every unit increase of risk. Similarly this graph is also different for different individuals, due to their risk appetite or risk aversion.

Exhibit 1.1 Relationship between risk and required rate of return[3]



[3] Chapter 1, An overview of Investment Process, Analysis of Investments and Management of Portfolios, Reilly & Brown, 10th edition

1.5 Types of Investments

There are many investment avenues. Broadly, investments can be classified into financial or non-financial investments. Non-financial investments include real estate, gold, commodities etc. Non-financial investments are also called Real Investments. Financial instruments are essentially claims on future cash flows. On the basis of claims on the cash flows, there are two generic types of financial instruments—debt and equity. Financial investments can also be classified on the basis of transferability of ownership in the secondary market, as security and non-security form of investments. Security form of investments, like shares, bonds, notes, etc., are easily transferable in the secondary markets. Whereas non-security form of investments like, fixed deposits, insurance, etc., cannot be transferable to any other investor and they do not have secondary markets. Security form of financial investments are actively traded on both capital and money markets.

1.5.1 Equity Shares: Role and characteristics:

Equity Shares represent ownership in a company that entitles its holders a share in profits and the right to vote on the company's affairs. Equity shareholders are residual owners of firm's profit after other contractual claims on the firm are satisfied and they have the ultimate control over how the firm is operated. Investments in equity shares reward investors in two ways: dividend and capital appreciation.

Investments in equities have proven time diversification benefits and considered to be a rewarding long-term investment. Time diversification benefits refer to the notion that fluctuation in investment returns tend to cancel out through time, thus more risk is diversified away over longer holding periods. It follows that investment in equities offer better risk-adjusted return if held for long time periods.

The concept of listed versus unlisted equity/ investments are explained in Box 1.2.

Box 1.2: Listed versus Unlisted

Equities or for that matter any financial investment can also be classified on the basis of the trading platforms. Listed investments are traded on a stock exchange. Unlisted investments are bought and sold over the counter. The key difference between the two is the structure of buying or selling the securities. Listed investments follow the listing rules and requirements. The segment of listed investments is called public market. The mechanism of trading at exchange floors enhances liquidity in listed securities and also leads to continuous pricing. However, prices in the public markets are more prone to market sentiments. Both equity as well as fixed income securities trade in this segment. Unlisted investment space is referred as private market. Pricing of investment in unlisted space is not continuous. It is performed at regular intervals or when the need for the same arises for buying or selling. Since these investments do not trade in stock exchange, they are relatively less liquid in comparison to listed investments. Hence, investors in unlisted securities may demand extra compensation called "illiquidity risk premium". Buying and selling of unlisted investments takes longer time compared to the listed investments.

1.5.2. Fixed income securities: role and characteristics:

Debt instruments, also called fixed income instruments, are contracts containing a promise to pay a stream of cashflows during the term of the contract to the investors. The debt contract can be transferable (a feature specified in the contract that permits its sale to another investor) or non-transferable, which prohibits sale to another party.

Generally, the promised cashflow of a debt instrument is a periodic payment, but the parties involved can negotiate almost any sort of cashflow arrangement. A debt contract also establishes the financial requirements and restrictions that the borrower must meet and the rights of the holder of the debt instruments if the borrower defaults.

Debt securities are issued by companies, municipalities, states and sovereign governments to raise money to finance a variety of projects and activities. Debt instruments can further be classified on the basis of issuer into government debt securities and corporate debt securities where the issuer is a non-government entity. Government securities form the largest component of debt market in India as well as the world.

1.5.2.1: Government versus Corporate debt securities:

A Government Security (G-Sec) is a tradeable instrument issued by the Central Government or the State Governments. It acknowledges the Government's debt obligation. Such securities are short term (usually called treasury bills, with original maturities of less than one year) or long term (usually called Government bonds or dated securities with original maturity of one year or more). In India, the Central Government issues both, treasury bills and bonds or dated securities while the State Governments issue only bonds or dated securities, which are called the State Development Loans (SDLs). G-Secs carry practically no risk of default and, hence, are called risk-free gilt-edged instruments.

A key source of funds for corporates is debt financing. Companies issue debt securities of various maturity profiles. Many of these corporate debt papers are listed on stock exchanges. However, a bigger component of corporate borrowings lies in the unlisted space. Corporate fixed income securities pay higher interest rates than the government securities due to the default risk. The difference between the yield on a government security and the corporate security for the same maturity is called "credit spread". Higher the probability of default greater would be the credit spread. Credit Spread could also be understood as the "Risk Premium" which the companies are paying to raise the debt, or the investors are charging for bearing default risk.

1.5.2.2. High yield versus Investment grade fixed income securities:

The probability of default on a fixed income paper is captured by ratings given by rating agencies. Table 1.1 gives the rating symbols given by CRISIL (Credit Rating Information

Services of India Limited, a rating agency registered with SEBI). This is further discussed in Section 4.3.

Table 1.1 Rating scale and description

Rating	Description
CRISIL AAA (Highest Safety)	Instruments with this rating are considered to have the highest degree of safety regarding timely servicing of financial obligations. Such instruments carry lowest credit risk.
CRISIL AA (High Safety)	Instruments with this rating are considered to have the high degree of safety regarding timely servicing of financial obligations. Such instruments carry very low credit risk.
CRISIL A (Adequate Safety)	Instruments with this rating are considered to have the adequate degree of safety regarding timely servicing of financial obligation. Such instruments carry low credit risk.
CRISIL BBB (Moderate Safety)	Instruments with this rating are considered to have the moderate degree of safety regarding timely servicing of financial obligation. Such instruments carry moderate credit risk.
CRISIL BB (Moderate Risk)	Instruments with this rating are considered to have the moderate risk of default regarding timely servicing of financial obligation.
CRISIL B (High Risk)	Instruments with this rating are considered to have the high risk of default regarding timely servicing of financial obligation.
CRISIL C (Very High Risk)	Instruments with this rating are considered to have the very high risk of default regarding timely servicing of financial obligation.
CRISIL D **(**Default**)**	Instruments with this rating are in default or are expected to be in default soon.

As can be observed in the rating description, higher rating denotes lower default risk and vice versa. The convention in the market is to classify bonds with rating BBB and above as investment grade and bonds below the BBB as high yield or junk bonds. Many institutional investors are prohibited from investing in junk bonds as they involve high default risk.

1.5.3: Money Market versus Capital market:

Money market securities have maturities of one year or less than one year. Treasury bills, Commercial Papers, Certificate of Deposits up to one year maturity are referred as money market instruments. Capital market is a place for long term fund mobilization. Securities with maturities greater than one year are referred to as capital market securities. Stocks and bonds are capital market securities. Since the investment horizon in capital market is longer, the uncertainty about the future cash flows go up. Investors require extra compensation for the same. It is referred as “term premium”.

1.5.4 Commodities

Both soft commodities such as corn, wheat, soybean, soybean oil and sugar and hard commodities which are mined such as gold, silver, oil, copper and aluminium are other investment avenues available to investors.

Soft commodities are perishable hence they exhibit high volatility in their prices. These commodities are subject to higher business cycle risk as their prices are determined by the demand and supply of the end products in which they are consumed. Soft commodities historically have shown low correlation to stocks and bonds.[4] Hence, they provide benefits of risk diversification when held in a portfolio along with stock and bonds. Prediction of weather is an important factor while investing in soft commodities. Exposure to these commodities can be taken through derivative contracts like forwards or futures. Hence, investors must carefully understand the risk involved in the same.

Prices of hard commodities are determined by the interaction between global demand and supply. Hard commodities such as gold and silver have been the investments avenues for centuries, as reserve assets. Due to its global acceptability gold has acquired the status of a "safe haven" asset. It is viewed as an attractive investment in times of economic uncertainty and geopolitical crisis. Gold has shown diversification benefits historically. Unlike most of the financial investments, commodities do not generate any current income and the investor in these commodities would have to count only on capital appreciation.

1.5.5 Real Estate

Real estate is the largest asset class in the world. It has been a significant driver of economic growth. It offers significant diversification opportunities. It has been historically viewed as good inflation hedge. Investors can invest into real estate with capital appreciation as investment objective as well as to generate regular income by way of rents. It is usually a long-term investment. Real estate is classified into two sub-classes: commercial real estate or residential real estate. It can be further broken down into terms of tier I, tier II and tier III cities. Real estate investments often involve large commitments. Real estate funds or real estate investment trusts REITs have emerged as a good option to enable investors to take exposure to this asset class with smaller outflow commitments.

1.5.6 Structured products

Structured products are customized and sophisticated investments. They provide investors risk-adjusted exposure to traditional investments or to assets that are otherwise difficult to obtain. Structured products greatly use derivatives to create desired risk exposures. Many structured products are designed to provide risk-adjusted returns that are linked to equity market indices, sector indices, basket of stocks with some particular theme, currencies, interest rates, commodity or a basket of commodities. Structured products can be designed for a short term or for long terms. The terms can be customized to meet the requirements of the investing community. These products require investments in larger denominations.

[4] a technical term used to measure movement between two variables. The benefits of diversification rests on correlation between investments. Lower the correlation between investments, higher the benefits of diversification i.e. reduction in risk.

They may offer capital protection from 0% to 100% and/or attractive yields. The performance of the structured product is largely driven by the underlying strategy subject to market conditions. Hence, they must not be taken as guaranteed capital protection or assured return products.

1.5.7. Distressed Securities

Distressed securities are the securities of the companies that are in financial distress or near bankruptcy. Investors can make investments in the equity and debt securities of publicly traded companies. These may be available at huge discounts, however investments in them require higher skills and greater experience in business valuation than regular securities. These securities can be considered from the perspective of diversification of risk. These securities are also referred as 'fallen angels' and many types of funds and institutional investors are prohibited from holding these securities because of the high risk involved. It is a popular investment segment among hedge fund managers as they have deep experience in valuation and credit analysis.

1.5.8 Other investment opportunities

Art and paintings and rare collectibles are emerging as an attractive long-term investment opportunity. This category of investment has been generating moderate returns in the long term. It also has low correlation with financial investments such as equities and bonds. Hence, it provides good risk diversification benefit. However, these are big ticket investments. Also, art is not a standard investment product as each work is unique. The market for the same is unregulated. These investments do not provide any income and just like gold, capital appreciation is the only way of reward. In terms of liquidity, this category is relatively more illiquid. To make rewarding investment decisions, specialized knowledge in arts is more crucial than in traditional financial assets due to higher levels of information asymmetry and adverse selection problems. There are art and painting based investment funds. Investors can take exposure through these funds.

1.6 Channels for making investments

Investors can invest in any of the investment opportunities discussed above directly or through intermediaries providing various managed portfolio solutions.

1.6.1 Direct investments

Direct investments are when investors buy the securities issued by companies and government bodies and commodities like gold and silver. Investors can buy gold or silver directly from the sellers or dealers. In case of financial securities, a few fee-based financial intermediaries aid investors buy or sell investments viz. brokers, depositories, advisors etc., for fees or commission.

1.6.2 Registered Investment Advisers

Investors can take the advice from SEBI Registered Investment Adviser (RIAs). As per SEBI Regulation relating to RIAs which came in the year 2013, only qualified professionals who are licensed by SEBI as Registered Investment Advisers (RIAs) can act as 'advisers'. These advisers are paid fees by the investors who hire them for investment advice. After this regulation, the distributors of financial products like mutual fund distributors, share brokers and insurance agents who would earlier act as investment advisers, can no longer claim the title. These advisers, like other fee-based professionals, are accountable to their investors. They are required to follow a strict code of conduct and offer advice in the investors' best interests. They are also required to disclose any conflict of interest. Advisers do basic risk profiling, assess the needs and requirements of the investors, understand their financial health and develop 'financial plans'. They help in inculcating a sense of discipline in investors. Thus advisor can help investors create an optimum investment portfolio and help them in making rational investment decisions.

1.6.3. Investments through managed portfolios

Alternatively, investors can invest through investment vehicles which pool money from investors and invest in variety of securities and other investments on their behalf. In other words, investors make indirect investments. These investment vehicles are professionally managed. Through these managed portfolios they can avail the professional expertise at much lower costs.

The following are examples of managed portfolio solutions available to investors in India:

- Mutual Funds
- Alternative Investment Funds
- Portfolio Managers
- Collective Investment Schemes

1.6.3.1 Mutual Fund

A mutual fund is a trust that pools the savings of a number of investors who share a common financial goal. Money collected through mutual fund is then invested in various investment opportunities such as shares, debentures and other securities. The income earned through these investments and the capital appreciation realized are shared by its unit holders in proportion to the number of units owned by them. Mutual fund is a pass-through intermediary in the true sense.

The following are the benefits of investing through mutual funds:

- Professional investment management
- Risk reduction through diversification
- Convenience

- Unit holders account administration and services
- Reduction in transaction costs
- Regulatory protection
- Product variety

However, mutual fund products are not 'get rich quick' investments. They are not risk-free investments. Mutual funds are strictly regulated by SEBI under Mutual Fund Regulation 1996.

1.6.3.2 Alternative Investment Fund

Alternative Investment Fund or AIF is a privately pooled investment vehicle which collects funds from sophisticated investors, for investing them in accordance with a defined investment policy for the benefit of its investors. The words 'privately pooled' denote that the fund is pooled from select investors and not from the general public at large. These private investors are institutions and high net worth individuals who understand the nuances of higher risk taking and complex investment arrangements. The minimum investment value in AIF is one crore rupees.

AIFs are categorized into three categories under the SEBI AIF Regulations for the purposes of registration and other operational requirements. These categories are mentioned below.

Category I AIF – is an AIF that invests in start-up or early stage ventures or social ventures or SMEs or infrastructure or other sectors or areas which the government or regulators consider as socially or economically desirable and shall include venture capital funds, SME Funds, social venture funds, infrastructure funds, special situation funds and such other AIFs as may be specified under the regulations from time to time. Other funds that are considered economically beneficial and are provided special incentives by the government or any regulator are also considered as part of this category.

Category II AIF – is an AIF that does not fall in Category I and III and which does not undertake leverage or borrow other than to meet day-to-day operational requirements or as permitted in the regulations. For this purpose, AIFs such as private equity funds or debt funds for which no specific incentives or concessions are given by the government or any other Regulator are included under this category.

Category III AIF – is an AIF that employs diverse or complex trading strategies and may employ leverage including through investment in listed or unlisted derivatives. AIFs such as hedge funds or funds which trade with a view to make short term returns or such other funds which are open ended and for which no specific incentives or concessions are given by the government or any other Regulator are included under this Category.

Internationally, the investors in a hedge fund (AIF category III) are very popular among large institutional funds such as pension funds, investment funds, insurance companies,

endowment funds, investment banks, family offices and HNIs. All these investors have large pools of funds and look for varied investment options beyond traditional investments. Hedge funds cater to the needs of such investors through alternative asset classes.

1.6.3.3 Portfolio Management Services

A portfolio manager is a body corporate who advises or directs or undertakes on behalf of the investors the management or administration of a portfolio of securities. There are two types of portfolio management services available. The discretionary portfolio manager individually and independently manages the funds of each investor. The non-discretionary portfolio manager manages the funds in accordance with the directions of the investors.

The portfolio manager enters into an agreement in writing with the investor, clearly defining the relationship and setting out their mutual rights, liabilities and obligations relating to the management of funds or portfolio of securities.

Portfolio Management Services are regulated by SEBI under Portfolio Manager Regulations. The regulations have not prescribed any scale of fee to be charged by the portfolio manager to its clients. However, the regulations provide that the portfolio manager shall charge fee as per the agreement with the client for rendering portfolio management services. The fee so charged may be a fixed amount or a return based fee or a combination of both.[5] The portfolio manager is required to accept a minimum Rs.50 lakhs or securities having a minimum worth of Rs.50 lakhs from the client while opening the account for the purpose of rendering portfolio management service to the client. Portfolio manager cannot borrow on behalf of his clients. Portfolio managers provide investment solutions unique to the needs of the investors.

Mutual Funds Alternate Investment Funds and Portfolio Managers

Mutual Funds, Alternate Investment Funds (AIFs) and Portfolio Managers (PMs) are managed portfolios. All three provide indirect way of investing in securities and other investments to investors. All three are regulated by SEBI. However, Mutual funds are more stringently regulated compared to AIF and PMS as mutual funds cater to retail investors. In case of AIF, the minimum amount required for investment is Rs. 1 crore and in case of PMS it is Rs. 50 lakhs. AIF and PMS cater to institutional and high net worth investors. These investors are expected to understand complex investment strategy and risks involved. The investment restrictions of PMS and AIF are also relatively less compared to mutual funds. So though, there are some similarities between them, there are important differences too.

[5] The fees could also be AUM based fixed fees or carry profit sharing or a combo.

Chapter 1: Sample Questions

1. The additional return required by the investor over and above the normal rate of return, when the investment is risky is called _____.
   a) Alpha
   b) Risk free rate of return
   c) Risk premium
   d) Both b & c

2. Future value of the investment is influenced by _____.
   a) Time period
   b) Rate of return
   c) Both a & b
   d) None of the above

3. _____ represent ownership in a company that entitles its holders to participate in its profits and the right to vote on the company's affairs.
   a) Bonds
   b) Commercial Papers
   c) Equity Shares
   d) All the above

4. Financial assets are generically classified into two broad categories _____.
   a) Debt & Equity
   b) Bonds and deposits
   c) Real estate & gold
   d) Equity & gold

5. In India, the Central Government issues _____.
   a) Treasury bills
   b) Dated securities
   c) Both a & b
   d) Certificate of deposits

CHAPTER 2: INTRODUCTION TO SECURITIES MARKETS

LEARNING OBJECTIVES:

After studying this chapter, you should understand about:

- Meaning of securities and the functions of securities market
- Structure of Securities Markets--Primary and Secondary markets
- Ways to issue securities
- Functions of different market participants
- Institutional participants and retail participants

2.1 Securities Market

The securities market provides an institutional structure that enables a more efficient flow of capital in the economy. The savings of household can be deployed to fund the capital requirement of a business enterprise, through the securities markets. The businesses issue securities, raise money from the household through a regulated contract, list the securities on a stock exchange to ensure that the security is liquid (can be sold when needed) and provides information about its activities and financial performance to the household. This basic arrangement in the securities markets enables flow of capital from households to business, in a regulated institutionalised framework.

The term "securities" has been defined in Section 2 (h) of the Securities Contracts (Regulation) Act 1956 (SCRA). The Act defines securities to include:

a) shares, scrips, stocks, bonds, debentures, debenture stock or other marketable securities of a like nature in or of any incorporated company or a pooled investment vehicle or other body corporate;

b) derivative [6];

c) units or any other instrument issued by any collective investment scheme to the investors in such schemes;

d) security receipt as defined in clause (zg) of section 2 of the Securitisation and Reconstruction of Financial Assets and Enforcement of Security Interest Act, 2002 (SARFAESI);

e) units or any other such instrument issued to the investors under any mutual fund scheme (securities do not include any unit linked insurance policy or scrips or any such

[6]As per SCRA, derivatives includes a security derived from a debt instrument, share, loan, whether secured or unsecured, risk instrument or contract for differences or any other form of security; a contract which derives its value from the prices, or index of prices, of underlying securities; commodity derivatives; and such other instruments as may be declared by the Central Government to be derivatives. [Amended by the Finance Act 2017]

instrument or unit, by whatever name called which provides a combined benefit risk on the life of the persons and investment by such persons and issued by an insurer referred to in clause (9) of section 2 of the Insurance Act, 1938 (4 of 1938);

f) units or any other instrument issued by any pooled investment vehicle

g) any certificate or instrument (by whatever name called), issued to an investor by any issuer being a special purpose distinct entity which possesses any debt or receivable, including mortgage debt, assigned to such entity, and acknowledging beneficial interest of such investor in such debt or receivable, including mortgage debt, as the case may be;

h) government securities;

i) such other instruments as may be declared by the Central Government to be securities (including onshore rupee bonds issued by multilateral institutions like the Asian Development Bank and the International Finance Corporation, electronic gold receipts, zero coupon zero principal instruments);

j) rights or interest in securities.

A security represents the terms of exchange of money between two parties. Securities are issued by companies, financial institutions or the government. They are purchased by investors. Security ownership allows investors to convert their savings into financial assets which provide a return. The issuers of securities are able to reach out to a broader group of investors. For example, in the absence of a well-developed securities market, a household with surplus fund may have to hold all of their savings in a bank deposit even if they are willing to take on some risk for higher returns. But with the different types of equity and fixed income securities available with varying levels of risk and return, investors can choose to invest their surplus funds in the type of security that suits their specific preferences. Thus, the objectives of the issuer and the investor are complementary and the securities market provides a vehicle to mutually satisfy their goals.

The issuer of the security provides the terms on which the capital is being raised. The investor in the security has a claim to the rights represented by the securities. These rights may involve ownership, participation in management or claims on assets.

The market in which securities are issued, purchased by investors and subsequently transferred among investors is called the securities market.

2.2 Primary and Secondary market

The securities market has two interdependent and inseparable segments, viz., the primary market and the secondary market. The primary function of the securities market is to enable the flow of capital from the pockets of savings, with idle or surplus resources to the pockets with deficit of resources but rich with productive ideas. To state formally, securities market

provides channels for conversion of savings into investments and back. The investors in the Indian securities market have a wide choice of financial products to choose from depending upon their risk appetite and return expectations.

The securities market has two interdependent and inseparable segments:

Primary Market: The primary market, also called the new issue market, is where issuers raise capital by issuing securities for the first time to the investors.

Secondary Market: The secondary market facilitates trades in the securities that are already-issued in the primary markets, thereby enabling investors to exit from an investment or new investors to buy the already existing securities.

The primary market facilitates creation of financial assets, and the secondary market facilitates their marketability/tradability which makes these two segments of Financial Markets - interdependent and inseparable. We shall look at each of the markets in detail in the next section.

2.2.1 Primary Market

As stated above, primary market is used by companies (issuers) for raising fresh capital from the investors. Primary market offerings may be a public offering or an offer to a select group of investors in a private placement program. The shares offered may be new shares issued by the company, or it may be an Offer for Sale(OFS), where an existing large investor/investors or promoters offer a portion of their holding to the public. Let us understand various terms used in the primary market context.

Public issue: Securities are issued to the members of the public, and anyone eligible to invest can participate in the issue. This is primarily a retail issue of securities.

Initial Public Offer (IPO): An initial public offer of shares or IPO is the first sale of a corporate's common shares to investors at large. The main purpose of an IPO is to raise equity capital for further growth of the business. Eligibility criteria for raising capital from the public investors is defined by SEBI in its regulations and include minimum requirements for net tangible assets, profitability and net-worth. SEBI's regulations impose timelines within which the securities must be issued and also other requirements such as mandatory listing of the shares on a nationwide stock exchange and offering the shares in dematerialized form etc.

Further Public Offer (FPO): When an already listed company makes either a fresh issue of securities to the public or an offer for sale to the public, it is called a further public offer or FPO. When a company wants additional capital for growth or desires to redo its capital structure by retiring debt, it raises equity capital through a fresh issue of capital in a further public offer. An FPO may also be through an offer for sale, which usually happens when it is

necessary to increase the public shareholding in the company to meet the regulatory requirements.

Rights Issue: Shares offered to existing shareholders in proportion to their existing holding in the share capital of the company are termed as "Rights shares" popularly known as rights issue. In the rights issue, the shareholders have a pre-emptive right to participate in the issue. In this rights issue, the offer is required to be made to the existing shareholders in proportion to their existing holdings. The shareholders who are offered right shares may or may not subscribe to the same. They may subscribe partly or fully to the offer.

Private Placement: When an issuer makes an issue of securities to a select group of persons and which is neither a rights issue nor a public issue, it is called private placement. This is primarily a wholesale issue of securities to institutional investors. It could be in the form of a Qualified Institutional Placement (QIP) or a Preferential Allotment[7].

According to Companies Act 2013, an offer to subscribe to securities, made to less than 200 persons, is called private placement of securities. The requirements of SEBI's regulations with respect to a public issue does not apply to a private placement. A privately placed security can be listed on a stock exchange provided it meets the listing requirements of SEBI and the stock exchange. Private placement of securities can be done by a company irrespective of whether it has made a public offer of shares or not.

Preferential Issue: Preferential issue is when a listed issuer issues shares or convertible securities, to a select group of persons (promoters or non-promoters). The issuer is required to comply with various provisions defined by SEBI relating to pricing, disclosures in the notice, lock-in, in addition to the requirements specified in the Companies Act.

Qualified Institutions Placements (QIPs): Qualified Institutions Placement (QIP) is a private placement of shares made by a listed company to certain identified categories of investors known as Qualified Institutional Buyers (QIBs). QIBs include financial institutions, mutual funds and banks among others. SEBI has defined the eligibility criterion for corporates to be able to raise capital through QIP and other terms of issuance under QIP such as quantum and pricing etc.

Bonus Issues: A bonus issue of shares is made to the existing shareholders of a company without any consideration from them. The entitlement to the bonus shares depends upon the existing shareholding of the investor. A bonus issue in the ratio 1:3 entitles the shareholder to 1 bonus share for every 3 held. The company makes the bonus issue out of its free reserves built from genuine profits. A company cannot make a bonus issue if it has defaulted on the payment of interest or principal on any debt securities issued or any fixed deposit raised.

[7] Qualified Institutional Placement and Preferential Allotment are different processes to raise capital addressing two different sets of investors, and under two different sets of contexts.

A company has to get the approval of its board of directors for a bonus issue. In some cases, the shareholders of the company also need to approve the issue. A bonus issue once announced cannot be withdrawn. The record date for the bonus issue will be announced and all shareholders as on the record date will be entitled to receive the bonus.

Onshore and Offshore Offerings: While raising capital, issuers can either issue the securities in the domestic market and raise capital or approach investors outside the country. If capital is raised from domestic market, it is called onshore offering and if capital is raised from the investors outside the country, it is termed as offshore offering.

Offer for Sale (OFS): An Offer for Sale (OFS) is a form of share sale where the shares offered in an IPO or FPO are not fresh shares issued by the company, but an offer by existing shareholders to sell shares that have already been allotted to them. An OFS does not result in increase in the share capital of the company since there is no fresh issuance of shares. The proceeds from the offer go to the offerors, who may be a promoter(s) or other large investor(s). The disinvestment program of the Government of India, where the government offers shares held by it in Public Sector Undertakings (PSUs), is an example of OFS. It may be stated that OFS is a secondary market transaction done through the primary market route.

Employee Stock Ownership Plan (ESOP): Some companies offer employee stock ownership plans that enable employees to own a small stake in the share capital of the company, as an incentive to participate in making the business successful. The terms and conditions on which employees can exercise the rights would be mentioned in the ESOP scheme. The option given to the employees can be exercised after a certain lock in period, which is generally more than one year. The dates on which the employees become entitled to exercise the right to acquire the shares is called as “vesting date.” The rights may vest fully or partially over the vesting period. For example, an employee is given 1000 options on 31st March, 2016 which can be exercised in phases like 30% on completion of one year, 30% on completion of second year and the balance on completion of the third year from the date of such grant.

Foreign Currency Convertible Bonds (FCCBs): FCCBs are foreign currency (usually dollar) denominated debt raised by companies in international markets but which have the option of converting into equity shares of the company before they mature.

The payment of interest and repayment of principal is in foreign currency. The conversion price is usually set at a premium to the current market price of the shares. FCCBs allow companies to raise debt at lower rates abroad. Also, the time taken to raise FCCBs may be lower than what it takes to raise pure debt abroad.

An Indian company that is not eligible to raise equity capital in the domestic market is not eligible to make an FCCB issue either. Unlisted companies that have raised capital via FCCB in foreign markets are required to list the shares on the domestic markets within a stipulated time frame.

FCCBs are regulated by RBI notifications under the Foreign Exchange Management Act, 1999 (FEMA). The Issue of Foreign Currency Convertible Bonds and Ordinary Shares (Through Depository Receipt Mechanism), 1993 lays down the guidelines for such issues.

Depository Receipts(DRs) - ADR / GDR: Depository receipts (DRs) are financial instruments that represent shares of a local company but are listed and traded on a stock exchange outside the country. DRs are issued in foreign currency, usually dollars.

To issue a DR, a specific quantity of underlying equity shares of a company is lodged with a custodian bank, which authorizes the issue of depository receipts against the shares. Depending on the country of issue and conditions of issue, the DRs can be converted into equity shares.

DRs are called American Depository Receipts (ADRs) if they are listed on a stock exchange in the USA such as the New York Stock Exchange (NYSE). If the DRs are listed on a stock exchange outside the US such as London Stock Exchange (LSE), they are called Global Depository Receipts (GDRs). The listing requirements of stock exchanges can be different in terms of size of the company, state of its finances, shareholding pattern and disclosure requirements.

When DRs are issued in India and listed on Indian stock exchanges here with foreign stocks as underlying shares, these are called Indian Depository Receipts (IDRs). SEBI has laid down the guidelines to be followed by companies for IDRs.

Anchor Investor: In the year 2009, SEBI introduced the concept of anchor investor in public issues. The volume and value of anchor subscriptions serve as an indicator of the firm's soundness of the offer. It also sets a benchmark and gives a guideline for issue pricing and interest among QIBs. Anchor investor means a qualified institutional buyer who makes an application for a value of ten crore rupees or more in a public issue made through the book building process in accordance with Securities and Exchange Board of India (Issue of Capital and Disclosure Requirements) Regulations.

2.2.2 Secondary Market:

While the primary market is used by issuers for raising fresh capital from the investors through issue of securities, the secondary market provides liquidity to these instruments. An active secondary market promotes the growth of the primary market and capital formation, since the investors in the primary market are assured of a continuous market where they have an option to liquidate or exit their investments. Thus, in the primary market, the issuers have direct contact with the investors, while in the secondary market, the dealings are between investors only. Secondary market can be broadly divided into two segments:

Over-The-Counter (OTC) Market: OTC markets are the markets where trades are directly negotiated between two or more counterparties. In this type of market, the securities are traded and settled over the counter among the counterparties directly.

Exchange Traded Markets: The other option of trading in securities is through the stock exchange route, where trading and settlement is done through the stock exchange. The trades executed on the exchange are settled through a clearing corporation, which acts as a counterparty and guarantees the settlement of the trades to both buyers and sellers.

Trading: A formal contract to buy/sell securities is termed as trading. As defined above, trading can be done either in the Over-The-Counter (OTC) or Exchange Traded Market. Securities/stock exchanges in India feature an electronic order matching system that facilitates automatic, speedy and efficient execution of trades.

Clearing and Settlement: Clearing and settlement are post trading activities that constitute the core part of equity trade life cycle. Clearing activity is all about ascertaining the net obligations of buyers and sellers for a specific time period. Settlement is the next step of settling obligations by buyers and sellers by paying money (if transaction is a buy transaction) or delivering securities (if it is a sell transaction).

While OTC transactions are settled directly between the counterparties, clearing corporation is the entity through which settlement of securities takes place for all the trades done on stock exchanges. The details of all transactions performed by the members (and their brokers) are made available to the Clearing Corporation by the stock exchange. The Clearing Corporation gives an obligation report to members and custodians who are required to settle their money or securities obligations within the specified deadlines, failing which they are required to pay penalties. In practice, the clearing corporation provides full novation of contracts between buyers and sellers, which means it acts as buyer to every seller and seller to every buyer. As a result, the operational risk of the transaction is substantially reduced to a trading investor.

Risk Management: In OTC transactions, counterparties are expected to take care of the credit risk on their own. In exchange traded world, the clearing corporation, as defined above, gives settlement guarantee of trades to the counterparties (all buyers and sellers). This exposes the clearing corporation to the risk of default by the buyers and sellers. To handle this risk, the clearing corporation charges various kinds of margins, most prominent among these margins are Initial or upfront margin and mark to market (MTM) margins. Initial margin is a percentage of transaction value arrived at based on concept of “Value At Risk” philosophy and MTM margin is the notional loss which an outstanding trade has suffered during a specified period on account of price movements.

2.3 Market Participants and their Activities

Market Participants in securities markets include buyers, sellers and various intermediaries between the buyers and sellers. Some of these entities are discussed in brief below:

2.3.1 Market Infrastructure Institutions and other intermediaries:

Stock Exchanges -Stock Exchanges provide a trading platform where buyers and sellers can transact in already issued securities. Stock markets such as National Stock Exchange (NSE), Bombay Stock Exchange(BSE) and Metropolitan Stock Exchange of India(MSEI) are nationwide exchanges. Trading happens on these exchanges through electronic trading terminals which feature anonymous order matching. Stock exchanges also appoint clearing and settlement agencies and clearing banks that manage the funds and securities settlement that arise out of these trades.

Depositories - Depositories are institutions that hold securities (shares, debentures, bonds, government securities, mutual fund units) of investors in electronic form. Investors open an account with the depository through a registered Depository Participant. They also provide services related to transactions in the securities held in dematerialized form. Currently there are two Depositories in India that are registered with SEBI—Central Depository Services Limited (CDSL), and National Securities Depository Limited (NSDL).

Depository Participant- A Depository Participant (DP) is an agent of the depository providing depository services to the investors. Depository participants enable investors to hold and transact in securities in the dematerialized form. While the investor-level accounts in securities are held and maintained by the DP, the company level accounts of securities issued is held and maintained by the depository.

Depository Participants are appointed by the depository with the approval of SEBI. Public financial institutions, scheduled commercial banks, foreign banks operating in India with the approval of the Reserve Bank of India (RBI), state financial corporations, custodians, stock-brokers, clearing corporations, Non-Banking Financial Companies(NBFCs) and Registrar to an Issue and Share Transfer Agents complying with the requirements prescribed by SEBI, can be registered as a DP.

Trading Members/Stock Brokers :Trading members or Stock Brokers are registered members of a Stock Exchange. They facilitate buy and sell transactions of investors on stock exchanges. All secondary market transactions on stock exchanges have to be essentially conducted through registered brokers of the stock exchange. Trading members can be individuals (sole proprietor), Partnership Firms or Corporate bodies, who are permitted to

become members of recognized stock exchanges subject to fulfilment of minimum prudential requirements.

Trades have to be routed only through the trading terminals of registered brokers of an exchange, to be accepted and executed on the exchange electronic system. Brokers can trade on their own account using their own funds. Such transactions are called proprietary trades.

SEBI registration to a broker is granted based on factors such as availability of adequate office space, equipment and manpower to effectively carry out his activities, past experience in securities trading etc. SEBI also ensures the capital adequacy of brokers by requiring them to deposit a base minimum capital with the stock exchange and limiting their gross exposures to a multiple of their base capital.

Brokers receive a commission for their services, which is known as brokerage. Several brokers provide research, analysis and recommendations about securities to buy and sell, to their investors.

Authorized persons (AP): Authorised Persons are agents of the brokers (previously referred to as sub-brokers) and are registered with the respective stock exchanges.[8] APs help in taking the services of brokers to a larger number of investors. Several brokers provide various services such as research, analysis and recommendations about securities to buy and sell, to their investors. Brokers may also enable screen-based electronic trading of securities for their investors, or support investor orders over phone. Brokers earn a commission for their services.

Custodians: A Custodian is an entity that is vested with the responsibility of holding funds and securities of its large clients, typically institutions such as banks, insurance companies, and foreign portfolio investors. Besides safeguarding securities, a custodian also settles transactions in these securities and keeps track of corporate actions on behalf of its clients. It helps in:

- Maintaining a client's securities and funds account
- Collecting the benefits or rights accruing to the client in respect of securities held
- Keeping the client informed of the actions taken or to be taken on their portfolios.

Clearing Corporation - Clearing Corporations play an important role in safeguarding the interest of investors in the Securities Market. Clearing agencies ensure that members on the Stock Exchange meet their obligations to deliver funds or securities. These agencies act as a legal counterparty to all trades and guarantee settlement of all transactions on the Stock Exchanges. It can be a part of an exchange or a separate entity.

[8] Vide SEBI Circular: SEBI/HO/MIRSD/DoP/CIR/P/2018/117 dated August 3, 2018, all the registered Sub-Brokers needed to migrate to act as an AP and/ or Trading Member (TM).

Clearing Banks - Clearing Bank acts as an important intermediary between clearing members and the clearing corporation. Every clearing member needs to maintain an account with the clearing bank. It is the clearing member's responsibility to make sure that the funds are available in its account with clearing bank on the day of pay-in to meet the obligations arising out of trades executed on the stock exchange. In case of a pay-out, the clearing member receives the amount in their account with clearing bank, on pay-out day.

Merchant Bankers- Merchant bankers are entities registered with SEBI and act as issue managers, investment bankers or lead managers. They help an issuer access the security market with an issuance of securities.

They are single point of contact for issuers during a new issue of securities. They evaluate the capital needs of issuers, structure an appropriate instrument, get involved in pricing the instrument and manage the entire issue process until the securities are issued and listed on a stock exchange. They engage and co-ordinate with other intermediaries such as registrars, brokers, bankers, underwriters and credit rating agencies in managing the issue process.

Underwriters - Underwriters are intermediaries in the primary market who undertake to subscribe any portion of a public offer of securities which may not be bought by investors. They serve an important function in the primary market, providing the issuer the comfort that if the securities being offered to public do not elicit the desired demand from investors, they (underwriters) will step in and buy the securities.

When the underwriters make their commitments at the initial stages of the IPO, it is called hard underwriting. For example, if the shares are not subscribed by investors, then the underwriters have to bring in the amount by subscribing to the shares.

Soft underwriting is the commitment given once the pricing is determined. The shares that devolve are usually placed with other financial institutions, thereby limiting the risk to the underwriter. Soft underwriting also comes with a clause that provides the option to exit from the commitment in the event of certain events occurring. The risk in hard underwriting is much higher than in soft underwriting.

2.3.2 Institutional Participants:

Institutional participants comprises mutual funds, pension funds, insurance companies, hedge funds, alternative investment funds, foreign portfolio investors. Some of them are defined here in brief:

Mutual Funds: A mutual fund is a professionally managed collective investment scheme that pools money from many investors to purchase securities on their behalf. Mutual fund companies invest the pooled money in stocks, bonds, and other securities, depending upon the investment objective of the scheme which is stated upfront. A fund manager, with the

help of a research team, takes all the major decision in terms of which companies to invest in, the percentage of each stock in the portfolio, when to exit and so on.

Pension Funds: A fund established to facilitate and organize the investment of the retirement funds contributed by the employees and employers or even only the employees in some cases. The pension fund is a common asset pool meant to generate stable growth over the long term, and provides a retirement income for the employees. Pension funds are commonly run by a financial intermediary for the company and its employees, although some larger corporations operate their pension funds in-house.

Insurance Companies: Insurance companies' core business is to insure assets. Depending on the type of assets that are insured, there are various insurance companies like life insurance and general insurance etc. These companies have huge corpus and they are one of the most important investors in the Indian economy by investing in equity investments, government securities and other bonds. Like mutual funds, each insurance company also has designated people who are responsible for investment decisions.

Alternative Investment Funds: The SEBI (Alternative Investment Funds) Regulations 2012 (AIF Regulations) define the term 'Alternative Investment Fund' (AIF) as one which is primarily a privately pooled investment vehicle. Under the SEBI AIF Regulations 2012, we can list the following types of funds as AIFs: Venture Capital Fund, Angel Fund, Private Equity Fund, Debt Fund, Infrastructure Fund, SME Fund, Hedge Fund and Social Venture Fund.

Foreign Portfolio Investors (FPIs): A Foreign Portfolio investor (FPI) is an entity established or incorporated outside India that proposes to make investments in India. These international investors must register with the SEBI to participate in the Indian securities markets.

EPFO: EPFO (Employees' Provident Fund Organization) is a statutory body set up under the Employees' Provident Funds & Miscellaneous Provisions Act, 1952. EPFO comes under the purview of Ministry of Labor and Employment. From 2015, EPFO is allowed to invest up to 15 per cent of incremental deposits in equity or equity related schemes.[9]

National Pension System: National Pension System (NPS) is a pension cum investment scheme launched by Government of India to provide old age security to Citizens of India. This defined contribution pension system is regulated by Pension Fund Regulatory and Development Authority (PFRDA).[10] The Central Government had introduced the National Pension System (NPS) with effect from January 1, 2004. Subsequent to Central Government, various State Governments adopted this architecture and implemented NPS with effect from different dates. For the non-government category there are two categories available: corporate sector

[9] EPFO does not invest in shares and equities of individual companies. (Source: PIB Press release)

[10] The government's pension plan has moved from defined benefit structure, where all retired employees of a particular rank get the same pension with no contributions by the employee, to a defined contribution structure, where the employee and the employer contribute to the pension fund and the pension received on retirement will depend upon the fund accumulated.

and All Citizens of India. NPS Corporate Sector Model is the customized version of NPS to suit various organizations. NPS schemes invest in equity shares, corporate bonds and government securities.

Family Offices: Family office can be defined as the ecosystem which the family builds around itself to manage its wealth. Family offices provide administrative support to investment management services with a view to coordinate the family financial needs, life style goals, charitable givings, estate planning etc. Family offices generally serve multiple generations. These are investment management firms catering to ultra-high net worth households/individuals (UHNWI) providing them customized investment management solutions.

Corporate Treasuries: Corporate treasuries are increasingly seen as profit centres. Traditionally, the role of corporate treasury has been that of manager of financial risks and provider of liquidity. The focus area of corporate treasuries has been debt management to capital structure management with the key responsibility of raising long term funds and minimizing the cost of capital.

2.3.3 Retail Participants

Retail Investors include individual investors who buy and sell securities for their personal account, and not for another company or organization. As per the SEBI Issue of Capital and Disclosure Requirements (ICDR) Regulations, 2018: 'Retail individual investor' means an individual investor who applies or bids for specified securities for a value of not more than Rs.2 lakh.

Chapter 2: Sample Questions

1. **Offer for sale (OFS) is method of share sale for _____**

a. listed companies
b. unlisted companies
c. startups
d. all the above

2. **Which of the following is essential for the public issue of a debt security?**

a. The debt issue size should be greater than Rs. 5000 crs.
b. The debt instruments must be credit rated.
c. The debt issuer must stand as guarantor for the payment of principal and interest.
d. The debt instruments should have a minimum coupon specified.

3. **Which of the following is the function of the secondary markets?**

a. Provide liquidity for securities issued
b. Provide a platform for making public issues
c. Provide information about public companies
d. **All the above**

4. **The risk of default on obligations arising out of trading is controlled by the exchange by _____.**

a. Restricting types of investors
b. Blocking high value trades
c. Imposing circuit filters
d. Imposing margins

5. **A trade that is squared-off during the day _____.**

a. Does not require delivery of shares
b. Is not guaranteed by the exchange
c. Is cancelled by the exchange
d. Is not considered in calculating trading volumes

CHAPTER 3: INVESTING IN STOCKS

LEARNING OBJECTIVES:

After studying this chapter, you should understand about:

- Equity as an investment opportunity
- Types of risk involved in equity investment
- Management of risk through diversification
- The process of equity research and stock selection
- Fundamental and Technical analysis of equity investment

3.1 Equity as an investment

Securities markets enable investors to invest and disinvest their surplus funds in various securities. These securities are pre-defined for their features, issued under regulatory supervision, and in most cases have ready liquidity. Liquidity refers to the marketability (meaning existence of sellers when one needs to buy; and buyers when one needs to sell). There are two broad types of securities that are issued by seekers of capital from investors: Equity and Debt. Equity securities are issued by companies providing ownership to the investor in their company, and Debt securities are issued by companies providing the rights of a lender to the investor. The features of both these securities differ due to the inherent difference in the claim of the investors on the company.

Equity investors also known as shareholders have residual claim[11] in the business. Because they are the owners of the company and not lenders, the company which issues equity securities is not contractually obligated to repay the amount it receives from the shareholders. It is also not contractually obligated to make periodic payments to shareholders for the use of their funds, like interest payments in the case of lenders. Equity investors get voting rights. When equity investor own a sizeable amount of shares in a company, they get an opportunity to participate in the management of the business.

Investors who purchase equity shares look for capital appreciation and dividend income. There is no assurance of both by the company to the equity investor. While dividend payment depends on the profitability of the company, capital appreciation depends on the conditions of the stock market. Because all residual benefits of deploying capital in a business go to the equity investor, it is usually expected that the return to equity investor should be higher than that of the debt investors (lenders).

[11] Claim on the company's net assets, i.e. the value of assets after all liabilities have been paid.

Choosing between equity and debt is a trade-off for investors. Investors desiring lower risk choose debt, at the cost of lower but stable return. However, if they seek higher returns they choose equity investment, but they may not be able to earn it without taking on the additional risk of the equity investment. Most investors tend to allocate their capital between these two choices, depending on their expected return, their investing time period, their risk appetite and their needs.

3.2 Diversification of risk through equity instruments

Equity is inherently riskier compared to bonds and many other asset classes. However, there are ways to mitigate the risks in stocks. The most meaningful way to risk reduction is through diversification – both on cross sectional (i.e. across business sectors and industries) as well as on time series basis (i.e. across various time periods).

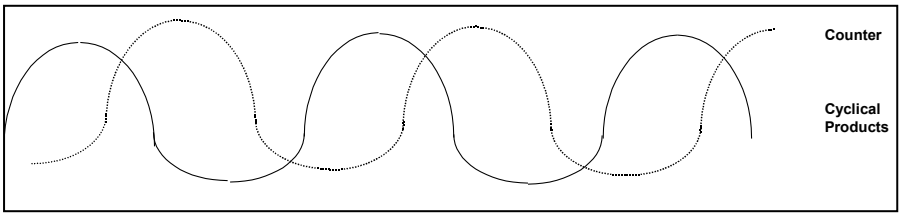
Empirical research has demonstrated that a significant portion of risk can be reduced through diversification. Conceptually, it is achieved due to the relatively less correlated behaviour of various business sectors which underlie each equity investment. This is what the old adage 'Don't put all your eggs in one basket' means.

Cross sectional risk diversification is reducing risk by holding equities in many different kinds of businesses at a point in time and also across various geographies of the world. Reaping the benefits of time diversification requires investing in equities for a long period of time. The belief is that bad times will get cancelled out by good times. This is why "time in the market" is suggested for equity investment as against "timing the market".

Underlying the word 'diversification' is the concept of business cycles and counter-cyclical businesses, and the phenomenon of lag and lead between the behaviour of investments returns and countries' economic performance.

In Exhibit 3.1, a business cycle is shown as a dark line. Some businesses may be at peak when the business cycle is in its trough, as shown by the broken line. These products or businesses are called 'counter-cyclical' or defensive businesses. Businesses that do better in a recession are called 'recession-proof' businesses. Some products, sectors or countries come out of a recession faster than others (these are called as leading sectors); other products, sectors or countries may go into recession later than others (these are called lagging sectors).

Exhibit 3.1 Counter-cyclical products



3.3 Risks of equity investments

Equities are often regarded as riskier than other asset classes. The main types of risks discussed in the context of equity investments are discussed below:

3.3.1 Market risk

Market risks arise due to the fluctuations in the prices of equity shares due to various market related dynamics. These factors affect all the listed, market traded assets, irrespective of their business sector. The degree of impact may be different. Beta is a proxy measure for market risk. Market risk cannot be diversified away, though it can be hedged.

3.3.2 Sector specific risk

Risks due to sector specific factors are not part of market risks. These risks can be diversified away by investing in different business sectors. Sector specific risks arise due to factors that affect the performance of businesses in a particular sector/industry. Factors affecting certain sectors might not impact certain other sectors. Such risks are also called “idiosyncratic risks”. Say for instance there are restrictions on the movement of international tourists, the airline industry and hospitality industry are going to be affected. But industries and business sectors dependent on domestic customers are not affected by such restrictions.

3.3.3 Company specific risk

Risks arising due to company specific factors are also non-market risks. These risks can also be diversified away by investing in different companies. Company specific risk arises due to factors that affect only the performance of a single company and other firms might not be affected by them. Though, overall, the airline industry goes through turbulent times, time and again, certain airlines withstood the rough weather and others exited helplessly. Such corporate debacles are due to company specific factors. Same is now being seen in telecom sector.

3.3.4 Liquidity risk

Liquidity risk is defined in Chapter 1. It is measured by impact cost. The impact cost is the percentage price movement - caused by a particular order size (let’s say an order size of Rs.1 lakh) - from the average of the best bid and offer price in the order book snapshot. The impact cost is calculated for both—the buy and the sell side. Less liquid stocks are more thinly traded, and a single large trade can move their prices considerably. Such stocks have high impact costs. A lower market impact implies the stock is more liquid.

3.3.5 Currency Risk

Prima facie, it appears that currency risk is not directly related to prices of equity. However, once the financial markets are open to the international investors, currency risk sets in. Currency risk arises due to uncontrollable, unpredictable and volatile exchange rates of various pairs of currencies. When a significant proportion of players in a financial market belong to the international institutional investors groups, then that financial market is bound to be related to exchange rate movements. Many times we hear that stock market reacts to FPIs' buy and sell pressure, and FPIs move in and move out of a country with changes in their home country interest rates, or due to sudden unfavourable exchange rate movements, like deep depreciations in their host countries or due to any other socio-politico-economic, industry or market shocks.

Apart from the above most prominent risks, all other macro-economic factors like inflation, fuel prices, interest rates, economic growth, economic slowdown, do influence stock markets.

3.4 Overview of Equity Market

Equity securities represent ownership claims on a company's net assets. A thorough understanding of equity market is required to make optimal allocation to this asset class. The equity market provides various choices to investors in terms of risk-return-liquidity profiles. There are opportunities in listed as well as unlisted equity space.[12] Investments in listed companies are relatively more liquid than investment in unlisted companies. Listed companies have to abide by the listing norms, making this investment space more regulated with better disclosures.

In addition to equity shares, companies may also issue preference shares. Preference Shares rank above equity shares with respect to the payment of dividends and distribution of company's net assets in case of liquidation. However, preference shares do not generally have voting rights like equity shares, unless stated otherwise. Preference shares share some characteristics with debt securities like fixed dividend payment. Similar to equity shares, preference shares can be perpetual. Dividends on preference shares can be cumulative, non-cumulative, participating, non-participating or some combination thereof (i.e. cumulative participating, cumulative non-participating, non-cumulative participating, non-cumulative non-participating). In case preference stock is cumulative, the unpaid dividends would accumulate to be paid in full at a later time, whereas in non-cumulative stocks the unpaid or omitted dividend does not get paid.

[12] Listing is a process through which the companies fulfilling the eligibility criteria prescribed by the Exchange(s) are admitted for trading on the Exchange.

A non-participating preference share is one in which a dividend is paid, usually at a fixed rate, and not determined by a company's earnings.

Participating preference share gives the holder the right to receive specified dividends plus an additional dividend based on some pre-specified conditions. Participating preference shares can also have liquidation preferences upon a liquidation event.

Preference shares can also be convertible. Convertible preference shares entitle shareholders to convert their preference shares into a specified number of equity shares. Since preference shares carry some characteristics of equity share and at the same time some of the debt securities, they are referred to as hybrid or blended securities.

The chief characteristic of equity shares is shareholders' participation in the governance of the company through voting rights. Generally companies issue only one kind of common shares, on the principle of 'one share, one vote'. Some companies, however issue share with differential voting rights (DVRs). Shares with DVRs can either have superior voting rights (i.e. multiple votes on one share) or inferior voting rights (i.e. a fraction of the voting right on one equity share) or differential rights as to dividend. Shares with DVRs are very popular in the western world for many decades. They have not really gained momentum in India. Though way back in 2000, the Companies Act, 1956, was amended to permit issuance of shares with DVRs, not many companies have issued shares with DVRs. Tata Motors was one of the first companies in India to issue DVRs in 2008. These DVRs carried 1/10 voting rights and 5% higher dividend than ordinary shares. Since then, Pantaloon Retails (currently Future Enterprises Ltd.), Gujarat NRE Coke Ltd., Jain Irrigation Systems Ltd. have issued DVRs.

Companies issuing equity shares can be classified on the basis of size—measured by way of their market capitalization as ultra large cap, large cap, mid-cap, small cap, micro-cap etc., each group represents a particular risk-return-liquidity profile. For example large cap companies as a group have lower variability in return than small cap companies.

Technological advancements and integration of global markets have expanded the investment opportunity set for the investors. They can invest in global equities within the restrictions placed by the RBI.

3.5 Equity research and stock selection

As there are thousands of opportunities available to investors in equity market, equity research and stock selection process plays a very important role in identifying stocks which suits the risk-return-liquidity requirements of the investors. Equity research involves thorough analysis and research of the companies and its environment. Equity research primarily means analysing the company's financials and non-financial information, study the

dynamics of the sector the company belongs to, competitors of the company, economic conditions etc..

The idea behind equity research is to come up with intrinsic value of the stock to compare with market price and then decide whether to buy or hold or sell the stock. There are many frameworks/methodologies available for stock selection. Analysts use fundamental analysis - top-down approach or bottom-up approach - quantitative screens, technical indicators etc., to select stocks.

3.5.1. Buy side research versus Sell Side Research

Though both Sell-side and Buy-side researchers and analysts take up similar works, they differ in terms of: for whom they work, how accurate they need to be, and for what are they paid.

Sell-side Analysts work for firms that provide investment banking, broking, advisory services for clients. They typically publish research reports on the securities of companies or industries with specific recommendation to buy, hold, or sell the subject security. These recommendations include the analyst's expectations of the earnings of the company and future price performance of the security ("price target"). In essence, the sell-side analysts are paid for providing useful information to be acted upon. In this regard, the expectations from the sell-side research is a broad guidance on multiple sectors, rather than accurate price predictions.

Buy-side Analysts work for fund managers like those of mutual funds, hedge funds, pension funds, or portfolio managers that purchase and sell securities for their own investment accounts or on behalf of their clients. These analysts generate investment recommendations for their internal consumption viz. use by the fund managers within organization. Research reports of these analysts are generally circulated among the top management/investment managers of the employer firms as these reports contain recommendations about which securities to buy, hold or sell. Therefore the buy-side researchers need to be more accurate and they are paid for their investment recommendations.

3.5.2. Fundamental Analysis

Fundamental analysis is the process of determining intrinsic value for the stock based on the fundamentals that drive its intrinsic value. These values depend on underlying economic factors such as future earnings or cash flows, interest rates, and risk variables. By examining these factors, intrinsic value of the stock is determined. Investor should buy the stock if its market price is below intrinsic value and do not buy, or sell, if the market price is above the intrinsic value, after taking into consideration the transaction cost. Investors who are engaged in fundamental analysis believe that, intrinsic value may differ from the market price but

eventually market price will merge with the intrinsic value. An investor or portfolio manager who can do a superior job of estimating intrinsic value will generate above-average returns by acquiring undervalued securities. Fundamental analysis involves economy analysis, industry analysis, company analysis.

Top Down approach versus Bottom up Approach

Analysts follow two broad approaches to fundamental analysis—top down and bottom up. The factors to consider are economic (E), industry (I) and company (C) factors. Beginning at company-specific factors and moving up to the macro factors that impact the performance of the company is called the bottom-up approach. Scanning the macro-economic scenario and then identifying industries to choose from and zeroing in on companies, is the top-down approach.

EIC framework is the commonly used approach to understanding fundamental factors impacting the earnings of a company, scanning both micro and macro data and information.

3.5.3. Stock Analysis Process

The value of an investment is determined by its expected cash flows and the investor's/analyst's required rate of return (i.e. its discount rate). The expected cashflows as well as required rate of return are influenced by the economic environment. The analyst needs to have good understanding of important economic variables and economic series. The macroeconomic analysis provides a framework for developing insights into sector and company analysis.

Economy Analysis

Macro-economic environment influences all industries and companies within the industry. Monetary and fiscal policy influences the business environment of the industries and companies. Fiscal policy initiatives such as tax reduction encourages spending while removal of subsidies or additional tax on income discourages spending. Similarly, monetary policy may reduce the money supply in the economy affecting the expansionary plans and working capital requirements of all the businesses. Hence a thorough macro-economic forecast is required to value a sector/firm/equity.

Any macro-economic forecast should include estimates of all of the important economic numbers, including gross domestic product, inflation rates, interest rates unemployment etc.

The most important thing an analyst does is to watch for releases of various economic statistics by the government, central bank and private sources. Especially, they keep a keen

eye on the Index of economic indicators like the Wholesale Price Index(WPI), Consumer Price Index(CPI), monthly inflation indices, Index of Industrial Production (IIP), Gross Domestic Product(GDP) growth rate etc. Analysts assess the economic and security market outlooks before proceeding to consider the best sector or company. Interest rate volatility affect different industries differently. Financial institution or bank stocks are among the most interest-sensitive of all sectors. Sectors such as pharmaceuticals are less affected by interest rate change.

The economy and the stock market have a strong and consistent relationship. The stock market is known as a leading economic indicator. A leading economic indicator is a measure of economic recovery that shows improvement before the actual economy does because stock price decisions reflect expectations for future economic activity, not past or current activity.

Industry/Sector Analysis

Industry analysis is an integral part of the three steps of top-down stock analysis. Industry analysis helps identify both unprofitable and profitable opportunities. Industry analysis involves conducting a macro analysis of the industry to determine how different industries relate to the business cycle.

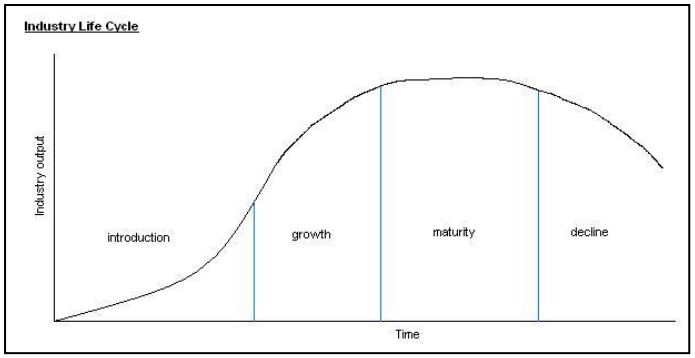
Performance of industries is related to the stage of the business cycle. Different industries perform differently in different stages of the business cycle. On the basis of the relationship different sectors share with the business cycles, they are classified as cyclical and noncyclical sectors. For example, banking and financial sector perform well towards the end of a recession. During the phase of recovery, consumer durable sectors such as producers of cars, personal computers, refrigerators, tractors etc. become attractive investments. Cyclical industries are attractive investments during the early stages of an economic recovery. These sectors employ high degree of operating costs. They benefit greatly during an economic expansion due to increasing sales, as they reap the benefits of economies of scale. Similarly, sectors employing high financial leverage also benefit during this phase, as debt is good in good times.

At the peak of business cycle, inflation increases as demand overtakes supply. Inflation impacts different industries differently. There are industries, which are able to pass on the increase in the costs of products to their consumers by increasing prices. Their revenue and profits may remain unaffected by inflation. Industries producing basic materials such as oil and metals benefits the situation. Rising inflation doesn't impact the cost of extracting these products. These industries can increase prices and experience higher profit margins. However, there are industries that are not able to charge the increased costs of production to their consumers. Their profitability suffers due to inflation.

During a recession phase also, some industries do better than others. Defensive industries such as consumer staples, pharmaceuticals, Fast Moving Consumer Goods(FMCG), outperform other sectors. In such times, even though the spending power of consumer may decrease, people still spend money on necessities.

Analysts also see the stage of the industry is in its life cycle. The number of stages in the life cycle of the industry are depicted in Exhibit 3.2.

Exhibit 3.2: Industry Life Cycle



Introduction: During this stage, industry experiences modest sale and very small or negative profit. The market of the products of the industry is small and the firms in the industry may have high development costs.

Growth: During this stage, market develops for the products or services of the industry. Number of firms in the industry is less during this phase and hence they may have little competition. Profit margins at this stage are generally high. This stage is followed by mature industry growth. The rapid growth of the earlier phase attracts competitors contributing profits margins go to normal levels.

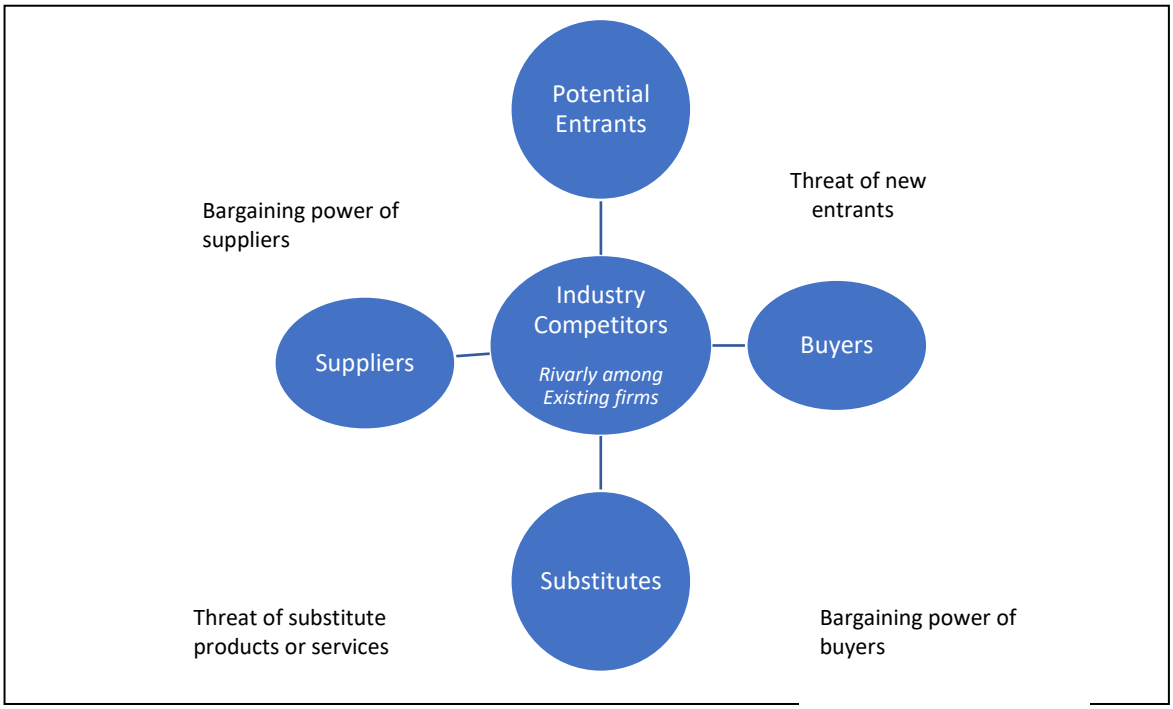
Maturity: This is generally the longest phase in the life cycle of the industry. During this stage, growth rate in the industry normally matches with the economy's growth rate. Firms in the industry differ from one another given their cost structure and ability to control costs. Competition is high during this stage reducing the profit margin to normal levels.

Deceleration of growth and decline: This stage observes decline in sales due to shift in demand. Profits margins are under pressure and some firms may even witness negative profits.

Similar to life cycle analysis, competitive structure of the industry is to be analysed by the analysts. It is a key factor affecting the profitability of the firms in the industry. Competition influences the rate of return on invested capital. If the rate of return is "attractive" it will encourage investment. Porter looked at forces influencing competition in an industry and the

elements of industry structure. He described these forces as industry's micro- environment. Porters model is presented in Exhibit 2.3.

Exhibit 3.3 Porter's Model



Michael Porter suggests that five competitive forces determine the intensity of competition in the industry, that in turn affects the profitability of the firms in the industry. The impact of these factors can be different for different industries.

The first factor is **rivalry among the existing competitors**. Every industry is analyzed to determine the level of rivalry amongst its firms. Rivalry increases when the industry has many firms of the same size. And hence firms may compete very hard to sell at full capacity. Generally, when rivalry is very high the rates of return would be low.

The second factor is **threat of new entrants**. The entry barriers influence the entry of new player to the industry. The analysts examine them, as they influence the future competitive structure of the industry and in turn profitability of existing firms. Generally, when an industry is well protected by high level of entry barriers, then the existing players can sustain higher growth rates and profitability.

The third factor is **threat of substitute products**. Substitute products influence the prices firms can charge for their products. Greater the substitutability of the product, lower the sustained earnings growth rate, and profit margins.

The fourth factor is **bargaining power of the buyers**. Buyers can influence the profitability of an industry when they are in position to demand lower prices or higher quality by showing a

susceptibility to switch among competitors. Higher the bargaining power lower the ability of the company to set the prices and hence profits.

The fifth factor is **bargaining power of the supplier**. Suppliers are more powerful if they are few and large in size. They can influence future industry returns if they increase prices or reduce the quality of the product. Hence higher the power of supplier, higher would be the cost of production and operation thereby decreasing profits.

Company Analysis

Company analysis is the final step in the top-down approach to stock analysis. Macroeconomic analysis prepares us to understand the impact of forecasted macro-economic environment on different asset classes. It enables us to decide how much exposure to be made to equity. Industry analysis helps us in understanding the dynamics of different industries in the forecasted environment. It enables us to identify industries that will offer above-average risk-adjusted performance over the investment horizon. If trends are favourable for an industry, the company analysis focusses on firms in that industry that are positioned to benefit from the economic trends. The final investment decision to be made is with regard to which are the best companies in the desirable industries? And are they attractive investments in terms of risk-adjusted returns.

Company analysis is to be differentiated from stock valuation. Company analysis is conducted to understand its strength, weaknesses, opportunities and threats. These inputs are used to determine the fundamental intrinsic value of the company's stock. Then this value is compared with the market price of the stock. If the intrinsic value is higher than the market price, the stock is bought and vice versa. It is very important to note that stocks of good companies need not make good investment opportunities. The stock of a good company with superior management and strong performance measured by current and future sales and earnings growth can be trading at a price much higher to its intrinsic value. It may not make a good investment choice.

Company analysis is needed to determine the value of the stock. There are many components to company analysis. Financial statement analysis of the company is often the starting point in analysing company. Analysing the profit and loss account, balance sheet and the cash flow statement of the company is imperative. The financial performance numbers of a company, as presented in the financial statements, can be used to calculate ratios that gives a snapshot view of the company's performance. The ratios of a company have to be seen in conjunction with industry trends and historical averages.

Another important component of company analysis is SWOT Analysis. SWOT analysis involves examination of a firm's, strengths, weaknesses, opportunities, and threats. Strengths and weaknesses deal with company's internal ability, like company's competitive advantage or disadvantages. Opportunities and threats deal with external situations and factors the

company is exposed to. Opportunities include a favourable tax environment, favourable change in consumer preference. An example of threat is stringent government regulation, or a big sized competitor, or changing technology etc..

Company analysis also involves analysing its competitive strategies. A firm may follow a defensive strategy. A defensive strategy is one where the firm positions itself in such a way that its capabilities provide the best means to deflect the effect of competitive forces in the industry. Alternatively, a firm may be following an aggressive strategy in which the firm attempts to use its strengths to affect the competitive forces in the industry.

Michael Porter suggests two major strategies: Cost Leadership and Differentiation.

Cost Leadership: Under this strategy the firm seeks to be the low-cost producer, and hence the cost leader in its industry. Cost advantages vary from industry to industry.

Differentiation Strategy: Under this strategy, the firm positions itself as unique in the industry. Again the possibilities of differentiation differ from industry to industry.

Another very important component of company analysis is understanding the business model of the company. As part of it, the following questions need to be asked.

- What does the company do and how does it do?
- Who are the customers and why do customers buy those products and services?
- How does the company serve these customers?

Almost all successful investors and fund managers repeat this thought that one must invest only in such firms where one understands the business. In the checklist for research, this is one of the most prominent questions – 'Do I understand the business?' No analyst should move to the next question if he/she can't address what a company does in a line with preciseness and clarity.

There are over 6000 companies listed on Indian exchanges. It is not possible to track and understand all of them. Investors should consider buying shares of few companies they understand rather than invest in a number of companies they don't understand.

Further, each sector has its own unique parameters for success, sales growth and profitability. For the retail sector, footfalls and Same Store Sales (SSS) are important parameters, whereas for banking it is Net Interest Income (NII)/ Net Interest Margin (NIM). For telecom, it is Average Revenue Per User (ARPU) and for hotels, it is average room tariffs and room occupancy etc. Analysts must possess an in-depth knowledge of the sectors while researching companies.

Further, each company will have its unique way of doing business. The efficiency with which products and services are produced and delivered to the customers may vary from one business to another and will significantly impact its earnings. Therefore, it becomes imperative for analysts to understand the entire business model of companies.

3.5.4. Estimation of intrinsic value

Once the analysis of economy, industry and company is completed, the analyst can go ahead with estimating intrinsic value of the firm's stock. Price and value are two different concepts in investing. While price is available from the stock market and known to all, value is based on the evaluation and analysis of the entity that is undertaking the valuation of the stock at a point in time. It may be noted that Price is a Fact but Value is an Opinion. There are various approaches to valuation. They are explained in the subsequent paragraphs. There are uncertainties associated with the inputs that go into these valuation approaches. As a result, with due diligence, the final output can at best be considered an educated estimate. That is the reason, valuation is often considered an art as well as a science. It requires the combination of knowledge, experience, and professional judgment in arriving at a fair valuation of any asset. The purpose of valuation is to relate market price of the stock to its intrinsic value and judge whether it is fairly priced, over-priced, or under-priced.

Three most popular approaches to valuation viz., discounted cashflow approach, asset based approach and relative multiple based approach are discussed below.

3.4.5.1. Discounted Cash Flow Model:

Conceptually, Discounted Cash Flow (DCF) approach to valuation is the most appropriate approach for valuations when three things are known:

- Stream of future cash flows
- Timings of these cash flows, and
- Expected rate of return of the investors (called discount rate).

Once these three pieces of information are available, it is simple mathematics to find the present value of these cash flows which a potential investor would be willing to pay today to receive the expected cash flow stream over a period of time.

Typically, any investment involves the outflow of cash. Later the investor expects, cash inflows during the investment horizon. Finally, at the time of disinvestment, the investor expects a large cash inflow - preferably larger than the original investment - representing the return of original investment with some appreciation. The same framework can be applied to valuing businesses. Popularly, profits are compared to the regular inflows from traditional investments. However, it should be appreciated that profits are accounting estimates rather than facts. Because accounting standards and tax authorities permit accrual accounting, there can be many valid adjustments to the figure of profit without any involvement of cashflows. Therefore profits in business and returns in the form of cashflows in financial investments are not comparable. This gave birth to the philosophy of estimating cashflows in business from the profit figures.

Business valuation professionals applied the philosophy of discounting to valuation of business entities, drawing from the postulates of time value of money and the fundamental framework, that ***"the intrinsic value of any asset, should be equal to the present value of future benefits that accrue from owning it***". For instance, when one holds a real asset, like land and buildings, its value should logically depend on the future rental income and resale value that could be generated from it, measured in present value terms. In case of a Bond, the intrinsic value of a bond should depend on the future coupons and the redemption value, measured in present value terms. In both the cases, the entity that estimated the intrinsic value, uses a particular discounting rate, which includes, the minimum risk free rate, the compensation for the term period of the investment, the premia for the asset specific risks, the transaction costs, and the taxes. The aggregate of all these components are referred to as required rate of return. However, in common parlance the transaction costs and taxes are taken as given, so they are ignored.

Extending the logic to business valuation or equity valuation, the investor should logically discount the future benefits accruing to the business or by being an equity investor. In case of a business that has not taken any debt in its capital structure, the entire profits belong to the owners. However when the company engages borrowed capital in the business, then the lenders also have a claim in the assets and profits of the business. If book profits are considered to be the future benefits, then Earnings Before Interest Tax Depreciation and Amortisation (EBITDA) are the profits left for both the lenders and owners before the company pays its corporate taxes, and recovers a desired capital expenditure through depreciation(tangible assets) and amortisation(intangible assets). Earnings After Tax or Profits After Tax(EAT or PAT) are the profits left for only the owners of the business, after having recovered a desired portion of capital expenditure, paid interest and corporate taxes. As discussed earlier, due to the inherent weaknesses with the EBITDA and EAT figures, valuation experts preferred cashflow versions of the two accounting figures mentioned above.

Free Cash Flow to the Firm (FCFF) represents the cashflow left for both the lenders and owners after the business keeps aside cash required for capital expenditure (CAPEX) and working capital. Therefore out of FCFF, lenders can take their interest and principal repayments, and the owners can take their dividends. Free Cash Flow to Equity (FCFE) represents the cashflow left only for the owners of the business. Therefore depending on the purpose of valuation, i.e. to value a firm or equity, either FCFF or FCFE is used, respectively.

FCFF for a future year is calculated as = Expected EBIT[13] (1-Tax Rate) + Expected Depreciation + Expected Non-Cash Expenses – Expected Capex[14] by the firm –Expected Increase in Working Capital

[13] EBIT = Earnings Before Interest and Tax
[14] CAPEX = Capital Expenditure (Huge, One time Expenditure which creates assets and infra to perform business operations)

FCFE for a future year is calculate as = [(Expected EBIT – INTEREST EXPENSE) * (1 – Tax Rate)] + Expected Depreciation + Expected Non-Cash Expenses – Expected Capex by the firm – Expected Increase in Working Capital – Expected Debt Repayments + Expected Fresh Borrowings

OR

FCFE = Expected FCFF – (Interest Expenses * (1- Tax Rate)) + (Expected Fresh Borrowings – Expected Debt Repayments)

OR

FCFE = Expected FCFF – (Interest Expenses * (1- Tax Rate)) + Expected Net Debt Issues

OR when the company has preference shares also in the capital, it is calculated as

FCFE = Expected FCFF – (Interest Expenses * (1- Tax Rate)) – Expected Preference Dividend + Expected Net Debt Issues + Expected Net Preference Share Issues

Apart from depreciation, other non-cash charges include amortization of intangible assets and loss on sale of assets, which are added back. Unrealised Gains on assets are deducted from the FCFF and FCFE calculations.

The FCFF and FCFE figures are known as "free" because all the other stakeholders, leaving the financiers of the business, are paid their dues before arriving at the figures. Further, the business is also treated as a stakeholder, and the funds required for its growth and sustenance are also provided in the form of Capital Expenditure(CAPEX), and working capital. Therefore what is left is for the financiers' to claim free of all encumbrances.

Rarely, FCFF may be negative, but there are reasonable chances that FCFE may be negative. In such cases the FCFF may be used for valuing the firm, and then the value of equity can be calculated by deducting the value of debt from it.

Valuation requires forecasting cashflows into the future. This can be done by applying historical growth rate exhibited by company or a rate estimated by the analysts based on their information and analysis. A firm may show a period of high growth in revenues, profitability, capex and other performance parameters, and then stabilize to a steady growth. It may be noted that growth rate in one parameter like sales, should not be considered as growth in assets, similarly the growth in assets cannot be considered as growth in profits or cashflows. However a good proxy that is used in the valuation industry for growth in profits is the product of ***retention ratio*** and ***return on equity*** as follows:

Growth in profits in a dividend paying firm = Retention Ratio * Return on Equity[15] OR (1 – DPR[16]) * ROE

Since equity is for perpetuity and it is not possible to forecast the cashflows forever, the practice is to calculate a terminal value of the firm. This terminal value is calculated as at the end of the year, till which time one could comfortably forecast the cash flows with all the available information. The terminal value may be calculated using the formula of a perpetually growing annuity. In this case cash flows are expected to grow, forever, at a steady, though, modest rate (usually referred to as stable growth rate). The average long term Gross Domestic Product growth rate or inflation rate is a good proxy for this growth rate. The terminal value is calculated by multiplying the cash flow for the last forecasted year, by (1+ Stable Growth rate) and dividing the resultant value by (Discounting rate[17] - Stable Growth rate). The terminal value is added as an additional independent component, to the stream of cash flows projected during the growth period or the projection period, and then aggregate of all these cashflows are discounted to the present usually the day of valuation).

Say for instance one could confidently forecast cashflows for the next 5 years. Then 5th year is the last year of the confident forecast, and from the 6th year onwards the cashflows are expected to grow constantly at the stable growth rate. The terminal value is calculated as at the end of 5th year and finally this value is discounted to the present, when the valuation exercise is undertaken.

The other method to calculate the terminal value is by applying a relevant multiple Enterprise Value (EV) / EBITDA or Price / Average Revenue per User (ARPU) to either a financial(EBITDA) or non-financial(ARPU) metric of performance of the firm, at the end of the confident forecasted year. Like in the 5th year as discussed in the previous paragraph.

The discount rate used in the DCF valuation should reflect the risks involved in the cash flows and also the expectations of the investors.

In most of the valuation exercises, cost of debt is taken at the prevailing interest rates in the economy for borrowers with comparable credit quality. And, cost of equity is the rate of return on investment that is required by the company's common shareholders. Capital Asset Pricing Model(CAPM), which establishes the relationship between risk and expected return forms the basis for cost of equity.

As per Capital Asset Pricing Model (CAPM) ,the cost of equity(Ke) is computed as follows:

$K_e = R_f + \beta * (R_m - R_f)$

[15] Return on Equity = ROE
[16] DPR = Dividend Payout Ratio
[17] Discounting Rate applicable will depend upon riskiness of the cashflows in the numerator, and who is entitled to them. In the following paragraphs we will learn that the discounting rate will be either Weighted Average Cost of Capital or Cost of Equity

where:

- R_f : Risk Free Rate (usually the ongoing 10 years government bond yield)
- $(R_m - R_f)$: Market risk premium (MRP) (which is a historical average value for a particular market or country)
- β = Beta (it is the sensitivity of a security's return to an index's return, which is chosen as a proxy for market portfolio)

The Weighted Average Cost of Capital of the firm (WACC) is then calculated as under:

WACC = [K_e * (Equity / (Equity+ Debt))] + [K_d * (1-Tax)* (Debt / (Equity+ Debt))] OR

WACC = [K_e * We] + [K_d * (1-Tx)*W_d]

where:

- K_e : Cost of Equity,
- K_d : Cost of Debt,
- W_d: Weight of Debt Capital
- W_e: Weight of Equity Capital

To calculate the value of the firm, its FCFF is discounted by the weighted average cost of capital (WACC). To calculate the value of equity, its FCFE is discounted using the cost of equity.

$$Value\ of\ Firm = \sum_{i=1}^{n} \frac{FCFF_i}{(1+WACC)^i} + \frac{TV}{(1+WACC)^i}$$

Where,
i = the period for which confident projections of cashflows are done, starting from 1 to n number of years in future
n = the last year for which the cashflows are projected year wise
'FCFF' and 'WACC' are as explained above

$$Terminal\ Value = \frac{FCFF_{n+1}}{WACC - g}$$

Where 'g' = is the stable growth rate of the FCFF in future.

The same equations are used to calculate the value of equity of the firm. The only changes are 'FCFF' is replaced with 'FCFE'; 'WACC' is replaced with 'ke'; 'g' is the stable growth rate of 'FCFE'

3.4.5.2. Asset Based Approach

Asset Based valuation methodology is used in some businesses where the business is asset heavy, and the assets are usually reflected in the financial statements at fair market value, like financial Institutions, firms in real estate and gold, gems and jewellery. Under this method, the value of the firm is equal to the "adjusted current market values of Net Tangible, Intangible, Financial, and Net Current Assets". Value of equity is "value of firm less value of all outsider liabilities". Significantly, the issue with this approach is that it does not recognise the value of future profits and cashflows of the firm, and all future possible value creation the firm can do due to its research and innovation.

3.4.5.3. Relative Valuation (Multiple Based)

When the entity that is undertaking the valuation, neither has adequate information to undertake an elaborate valuation exercise like the discounted cashflow approach, nor does it believe in the financial statement values of the assets and liabilities of a firm, it adopts Relative or Multiple based valuation.

Relative valuation arrives at the value of a firm or equity, by multiplying either a financial metric or a non-financial metric of a firm with some number. This number is called a "multiple". The multiple is created as a "ratio" by relating historical market values of either the firm, or its equity, to any chosen financial or non-financial metric. The multiple is calculated for the comparable firms, and then the average value of the same is chosen to value the target company. The value of the target firm is calculated as "the product of the target firm's financial or non-financial metric TIMES the comparable firm's multiple"

While choosing the multiple, the relative valuation approach believes that the value of a firm should very closely relate to the value of other firms in the same business sector. Such other firms are comparable on the basis of asset size, revenue size, business model, revenue model, and product line offering etc. The assumption of this approach is that "a company into confectionary products would not be worth more than any other similar confectionary company currently traded and operating in the market".

The numerator of the multiple in most of the cases is either the Price of the equity share of a comparable firm or its Enterprise Value(EV). Enterprise Value is the sum of "Market value of Equity and Market Value of Debt LESS the value of excess Cash in the business".

The denominator in the multiples are either various versions of Profits or Revenue or Cashflows or Book Value of Equity. Off late, the increasing start-up culture and their long gestations to experience profits in a growing firm, industry analysts have also started relating the value to non-financial metrics. The chosen metric is believed by the analyst to be a

significant value driver of the firm, in that business sector. This belief may appear to be like a subjective judgement call, however there are some fundamental relationships underlying the non-financial metric and the profits or revenues. For instance “Average Revenue per Mega Byte (ARMB)” “Average Revenue per User (ARPU)” in the case of Telecom companies, “Plant Load Factor” in the case of Power companies, “Occupancy Rates” in the case of Lodging Hotels, “Footfall” in the case of Retail sector, etc.,

The following are some of the popular multiples used in the valuation of equity and firm.

P/E Ratio

The most common stock valuation measure used by analysts is the price to earnings ratio, or P/E.

For computing this ratio, the stock price is divided by the EPS figure.

For example, if the stock is trading at Rs. 100 and the EPS is Rs. 5, the P/E is 20 times.

Historical or trailing P/Es are computed by dividing the current market price of the equity share by the sum of the last four quarters’ EPS. Forward or leading P/Es are computed by dividing the current mark price of the equity share by the sum of the expected next four quarters of EPS. Current P/E Ratio is current market price of the equity share divided by the current or the immediate recent annual EPS of a company.

For example, consider a company whose fiscal year ends in March every year. In order to compute the forward P/E for the financial year ending 2019 (technically called FY19), an investor would add together the quarterly EPS estimates for the future quarters ending June 2019, September 2019, December 2019 and March 2020. Then the current market price of equity is divided by this number aggregate number to get a forward P/E Ratio.

A stock's P/E tells us how much investor is willing to invest in an equity share, per rupee of earnings. Therefore a P/E ratio of 10 suggests that investors in the stock are willing to invest Rs. 10 for every Re. 1 of earnings that the company generates.

For judging whether the target firm is fairly valued, undervalued or overvalued, its PE ratio is compared with the market PE ratio (i.e. of Nifty 50, S&P Sensex, SX40, among others), or the average PE ratio of the industry to which it belongs, or with the PE ratios of peer group companies. For example the PE Ratio of the target company is 18, and that of the industry, market or the comparable firms is 22, then the firm is judged to be undervalued.

There are certain limitations to using the PE ratio as a valuation indicator. The projected P/E ratios are calculated based on analyst estimates of future earnings that may not be accurate. PE ratios of companies that are not profitable, and consequently have a negative EPS, are difficult to interpret. P/E ratios change constantly and the ratio needs to be recomputed every time there is a change in the price or earnings estimates. The average P/E ratio in the market and among industries fluctuates significantly depending on economic conditions.

As a general guidance one is advised to approach relation valuation in this manner. For example, all things being equal, a Rs.10 stock is enjoying a P/E of 75, then it is should be considered "expensive" than a Rs.100 stock with a P/E of 20.

Price to Book Value Ratio

Price to Book Value (P/BV) is another relative valuation ratio used by investors. It compares a stock's price per share (market value) to its book value of equity per share. The P/BV ratio is an indication of how the market is valuing the book value of equity or how much more less are the shareholders valuing the equity to be. The market price being above or below the book value is much to do with market players and investor's expectations of the value currently not recognised in the books.

$$\text{Price/Book Value Ratio} = \frac{\text{Stock Price per Share}}{\text{Shareholders' Equity per Share}}$$

The book value per share is calculated by dividing the reported shareholders' equity by the number of equity shares outstanding. Care should be taken, to exclude any existing miscellaneous assets in the balance sheet from the reported shareholder's equity value. Because the value equity has already been eroded as per books, to the extent of value of miscellaneous assets.

If a company's stock price (market value) is lower than its book value, it can indicate one of two possibilities. The first scenario is that the stock is being incorrectly undervalued by investors due to lack of information, and hence the company's stock represents an attractive buying opportunity. On the other hand, if the company is being correctly valued in the opinion of the investors, then it is due to the existence of some "value less" assets in the books or fictitious profits or reserves in the shareholder's equity.

The use of book value as a valuation parameter also has limitations because a company's assets are recorded at historical cost less depreciation. Depending on the age of these assets and their physical location, the difference between current market value and book value can be substantial. Also, assets like intellectual property are difficult to assess in terms of value. Hence, book value may undervalue these kinds of assets. Though P/B ratio has its shortcomings, is still widely used as a valuation metric especially in valuing financial services and banking stocks where the assets are marked to market.

P/S Ratio

The price-to-sales ratio (Price/Sales or P/S) is calculated by taking a company's market capitalization (the number of outstanding shares multiplied by the share price) and divide it by the company's total sales or revenue over the past 12 months. The logics applied for identifying the undervalued and overvalued shares are similar in this multiple too. Sometimes concerns are raised regarding the tendency of the firms to manipulate earnings. In such situations, price to sales ratio can be used instead of earning based ratios as sales are less prone to manipulation. Also in case of companies not earning profits yet, or companies in

high volume low margin businesses instead of earning based ratios investors can look at the P/S ratio to determine whether the stock is undervalued or overvalued. Typically the forward Price to Sales ratio is given as below

$$\frac{P}{S} = \frac{P_t}{S_{t+1}}$$

P_t = end of the year stock price for the firm
S_{t+1} = expected annual sales per share for the firm for the next year

Price Earnings to Growth Ratio

Price earnings to growth ratio (PEG Ratio) takes three factors into account—the price, earnings and earnings growth rates. The formula used to compute the PEG ratio is as below:

$$\text{PEG Ratio} = \frac{\text{Price/Earnings (P/E) Ratio}}{\text{Earnings Per Share (EPS) Growth}}$$

(EPS is calculated as Profit after tax (PAT)/Number of outstanding common shares of the company)

This ratio may be interpreted as the price that an investor is willing to pay for a company, as justified by the growth in earnings. The assumption with high P/E stocks is that investors are willing to buy at a high price because they believe that the stock has significant growth potential. The PEG ratio is an improvisation of the PE ratio using a companion variable called growth. Using either the industry or the comparable firms' PEG ratios one can decide whether the target firm's equity is overvalued or undervalued. The PEG ratio may show that one company, compared to another, may not have the growth rate to justify its higher P/E, and its stock price may appear overvalued.

The thumb rule is that if the PEG ratio is 1, it means that the market is valuing a stock in accordance with the stock's estimated EPS growth. If the PEG ratio is less than 1, it means that the stock's price is undervalued given its growth rate. On the other hand, stocks with PEG ratios greater than 1 can indicate just the opposite - that the stock is currently overvalued. This is based on an assumption that P/E ratios should approximate the long-term growth rate of a company's earnings.

The efficacy of the PEG ratio as a valuation measure will depend upon the accuracy with which the earnings growth numbers are estimated. Overestimation or underestimation of future earnings will lead to erroneous conclusions about the valuation of the share.

Economic Value Added (EVA) and Market Value Added (MVA)

There are many ways analysts can estimate the value of a company. EVA and MVA are some of the other common metrics used to determine a company's value.
Economic value added (EVA) attempts to measure the true economic profit produced by a company. It is also referred to as "economic profit". Economic profit can be calculated by taking a company's net after-tax operating profit and subtracting from it the product of the company's invested capital multiplied by its percentage cost of capital.

EVA provides a measurement of a company's economic success over a period of time. This measure is useful for investors who wish to determine how well a company has produced value for its investors.
Market Value Added (MVA) is the difference between the current market value of a firm and the original capital contributed by investors. If the MVA is positive, the firm has added value. If it is negative, the firm has destroyed value. The amount of value added needs to be greater than the firm's investors opportunity cost. The opportunity cost is calculated by estimating the return the investors would have got by investment in the market portfolio adjusted for the leverage of the firm.

EV/EBITDA Ratio

Enterprise Value (EV) is an important component of many ratios analysts use to compare companies, such as the EV/EBITDA multiple.

The EV of a business is: Market capitalization of equity + Market Value of Debt - Excess cash and cash equivalents

There can be two ways to understand EV. One is to understand how much capital is actually committed in the enterprise that is revenue generating. The other is when some entity is interested to acquire another firm, how much cash would be required to buy the target firm. The assumption is that no entity would be interested in paying cash to acquire cash.

EV can be related to Earnings/Cash from Operations available to the entire fund providers i.e. equity and debt holders. The appropriate financial metric would be Earnings before Interest and Taxes (EBIT). However EBIT is again influenced by the accrual mechanics of the accounting system, and hence to adjust it to make it nearer to a cashflow based measure, analysts have coined EBITDA (Earnings Before Interest Tax Depreciation and Amortisation).

The EV/EBITDA multiple is extremely useful in valuing firms which are highly capital intensive and they are not yet making book profits at PAT level or at EBIT level, however, at a gross level before recovering depreciation and amortisation (a form of capital recovery) the firm is generating surplus. If one goes by the P/E ratio, then unless the company is profitable

meaning it generates a positive PAT, the P/E ratio would not be meaningful at all for valuation. Though the company is listed and has a good price in the market, the earnings per share is negative, which is not intuitive to analysts and investors. Investors can still be bullish and positive about such companies, because they understand the need to wait till the company breaks-even or till the impact of capital expenditure on the revenues and profits kicks off. EV/EBITDA accommodates this thought process. It can be used to judge whether the firm is overvalued or undervalued by comparing its EV/EBITDA value with that of the industry average, or its relevant decile or quintile.

EV/S Ratio

Enterprise value-to-sales (EV/sales) compares the enterprise value (EV) of a company to its annual sales. The EV/sales multiple enables investors to value a company based on its sales, while taking account of both the company's equity and debt, and hence, comprehensive than Price to Sales Ratio. This ratio is more meaningful when the firm is highly capital intensive and its sales and profits cannot be ascribed only to equity investments.

Industry/sector specific valuation metrices

As discussed above, there are different valuation tools. No one method is perfect for all the sectors and companies. Different sectors are valued on different metrices. Non-cyclical sectors like FMCG and Pharma which generate predictable cashflows can be valued using discounted cashflow technique. Replacement cost method is applied for valuing businesses which are capital intensive like cement and steel. Relative valuation tools like P/E Ratio are used as add on metrics across all sectors. It is also popularly used to comment on the valuation of market, comparing it with other markets and also doing comparison over a period of time. Often newspapers and media report the P/E ratio of the market and comment that it is expensive or cheap, compared to other emerging markets. P/B ratio is very popular among banks and financial service sector. Investors/analyst should understand the characteristics and attributes of the sector before they select a particular valuation tool.

3.5.4.4. Combining Relative Valuation and Discounting Models:

Discounting models are used to estimate the intrinsic value of the stock. The relative valuation multiples arrive at the likely market value the firm would enjoy, by comparing it to similar firms or industry at large. Further the multiples can be categorised as transaction multiple or trading multiples, which provide a good handle for the valuation professionals to justify their valuation and also to adjust their intrinsic valuations according to the latest market sentiments. Trading multiples are based on the prices in the markets at which trades have consummated. Transaction multiples are based on the purchase considerations of the recent corporate acquisitions which depict the motivations and future prospects as seen by strategic acquirers, who are unlike the intraday or technical based traders in the markets.

Discounting models are dependent on the (1) the growth rates of whichever variable is chosen in the numerator and (2) the required rate of return as the discount rate. If Dividends are substituted in the DCF models that used FCFF or FCFE as discussed in the previous sections and with an assumption that dividends of a firm are going to be given eternally with a constant growth rate, then the formula for terminal value calculations can be applied to arrive at the intrinsic value of dividends as follows.

This ratio is also influenced by the same variables that influence the value under the discounted cash flow techniques. Price is calculated as follow. This is also the famous Dividend Discounting Model.

$$P = \frac{D_1}{k - g}$$

D_1= is the dividend that is expected one year hence. This can be as D_0*(1+g) where 'g' denote expected growth in dividend, and D_0 indicates current dividend. 'k' is the discount rate which is the proxy for the required rate of return of the equity investors. A deeper look into the formula that D_1 can be expressed as E_1 * DPR which is the expected Earnings Per Share a year hence multiplied by Dividend Payout Ratio (DPR). So the formula can be expressed as follows

$$P = (E1 * DPR)/(k - g)$$

Now, let us look at the P/E ratio to understand the connection between discounted techniques and relative valuation:

Forward P/E Ratio = Price / Expected Earnings Per Share or P / E_1

To convert the dividend discounting model depicted above to a P/E ratio, one can divide both the sides of the equation by $\boldsymbol{E_1}$(expected earning during the next time period) to get

$$\frac{P}{E_1} = \frac{DPR}{k - g}$$

Thus P/E Ratio is affected by three variables:

1. Required rate of return of the equity investors (k)

2. Expected growth rate of dividends (g)

3. The dividend payout ratio of the firm.

Higher the expected growth rate of dividends, higher would be the P/E ratio. Higher the required rate of return on equity, lower would be the P/E ratio. Higher the dividend payout ratio higher would be the P/E ratio. The above equation is usually known as "Fundamental P/E" of a company, which is derived based on how the firm is performing and the expectations of the equity investors. However this ratio appears to show its dependence on dividend

payout ratio, and hence it should be cautiously applied to only companies which are stable dividend paying and then compare with such companies only. This approach cannot be applied to start-ups, irregular dividend paying companies, and companies which are in a growth path and the markets are accounting for such a growth in the price.

3.6 Technical Analysis

Technical analysis is based on the assumption that all information that can affect the performance of a stock, the company fundamentals, the economic factors and market sentiments, are reflected already in its stock prices. Accordingly, technical analysts do not analyse the fundamentals of the business. Instead, the approach is to forecast the direction of prices through the study of patterns in historical market data—price and volume. Technicians (sometimes called chartists) believe that market activity will generate indicators/signals through price trends that can be used to forecast the direction and magnitude of stock price movements in future.

There are three essential assumptions in technical analysis about the price and volume behaviour:

1. The history of past prices provides indications of the underlying trend and its direction.
2. The volume of trading that accompanies price movements provides important inputs on the underlying strength of the trend.
3. The time span over which price and volume are observed influences the strength or weakness of the underlying trend.

Technical analysis integrates these three elements into price charts, points of support and resistance in charts and price trends. By observing price and volume patterns, technical analysts try to understand if there is adequate buying interest that may take prices up, or vice versa.

Technical Analysis is a specialized stream in itself and involves study of various trends- upwards, downwards or sideways, so that traders can benefit by trading in line with the trend. Identifying support and resistance levels, which represent points at which there is a lot of buying and selling interest respectively, and the implications on the price if a support and resistance level is broken, are important conclusions that are drawn from past price movements. For example, if a stock price is moving closer to an established resistance level, a holder of the stock can benefit by booking profits at this stage since the prices are likely to retract once it is close to the resistance level. If a support or resistance is broken, accompanied by strong volumes, it may indicate that the trend has accelerated and supply and demand situation has changed. Trading volumes are important parameters to confirm a trend. An upward or downward trend should be accompanied by strong volumes. If a trend is not supported by volumes or the volumes decrease, it may indicate a weakness in the trend.

Technical analysis converts the price and volume data into charts that represent the stock price movements over a period of time. Some of the charts used include line charts, bar charts, candlestick chart. The patterns thrown up by the charts are used to identify trends, reversal of trends and triggers for buying or selling a stock. Typically, chartists use moving average of the price of the stock to reduce the impact of day to day fluctuations in prices that may make it difficult to identify the trend.

3.6.1. Assumptions of technical analysis

From the above discussion on what technical analysts do, the following assumption are delineated:

1. The market price is determined by the interaction of supply and demand.
2. Supply and demand are governed by many rational and irrational factors.
3. Price adjustments are not instantaneous and prices move in trends
4. Trends persist for appreciable lengths of time.
5. Trends change in reaction to shifts in supply and demand relationships.
6. These shifts can be detected in the action of the market itself.

3.6.2. Technical versus Fundamental Analysis

Fundamental analysis involves determining the intrinsic worth of the stock and comparing it with the prevailing market price to make investment decisions. Fundamental analysts believe that prices will move towards their intrinsic value sooner or later. Technical analysis is not concerned whether the stock is trading at a fair price relative to its intrinsic value. It limits itself to the future movements in prices as indicated by the historical data. It is used for short-term trading activities and not necessarily long-term investing.

3.6.3 Advantages of technical Analysis

Technicians feel that the major advantage of their method is that it is not heavily dependent on financial accounting statements. They feel that a great deal of information is lacking in financial statements. They also contend that a lot of non-financial information and psychological factors do not appear in the financial statements.

Technicians also feel that unlike fundamental analysts, they do not need to collect information to derive the intrinsic value of the stocks. They only need to quickly recognize a movement to a new equilibrium value for whatever reason. Hence they save time in collecting enormous information and data which is a prerequisite for fundamental analysis.

3.6.4 Technical Rules and Indicators

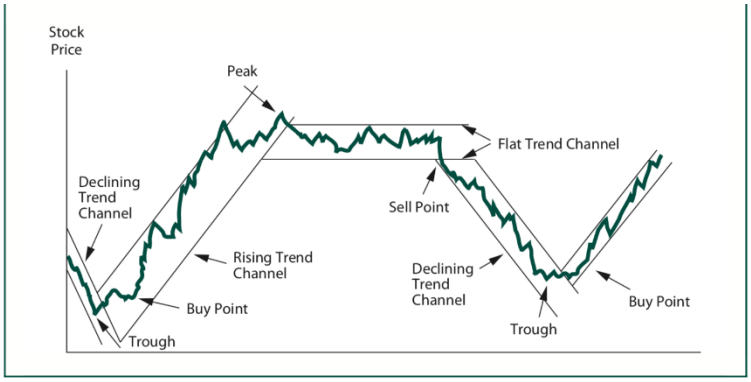
Technical analysts use past prices and trading volume or both to predict future prices. A broad range of techniques and indicators based on price and volume data such as chart analysis, moving averages, filters and oscillators are used to identify predictable patterns in stock prices. There are numerous trading rules and indicators. There are indicators of overall market momentum, used to make aggregate market decisions. There are trading rules and indicators to be applied for individual securities. Some of the popular ones are:

- Trend-line analysis
- Moving averages
- Bollinger-Band Analysis

Trend-Line Analysis

The graph (Exhibit 2.4) shows a peak and trough, along with a rising trend channel, a flat trend channel, a declining trend channel, and indications of when a technical analyst would ideally want to trade.

Exhibit 3.4: Stock price trend line



Moving-Average Analysis

Moving-Average Analysis is the most popular technical indicator. The moving average of a time series of past prices can provide a nonlinear graphic of price movements. Generally a 5, 10, 30, 50, 100, and 200 days moving averages are calculated. One simple strategy for using the moving-average analysis is to buy when the price is sufficiently below the moving average and sell when the price is sufficiently above the moving average.

Bollinger-Band Analysis

Bollinger bands use normal distribution to calculate the deviation of the market price from the moving average. For example, when the price goes two standard deviations above the moving average, the stock might be regarded as overbought. If the price goes two standard deviations below the moving average, the stock might be regarded as oversold.

3.6.5 Fixed income securities and Technical analysis

The techniques depicted above can also be applied to the fixed income securities as long as price and volume data is available. The theory and rationale for technical analysis of bonds are the same as for stocks, and many of the same trading rules are in fact used by analysts in bond markets.

3.7 Understanding Corporate Governance

While analysing companies, the qualitative aspects of the companies are equally important if not more. Corporate governance practice are the cornerstone in evaluating a business. Corporate governance has become a well-discussed topic in business world. Newspapers and media report detailed accounts of corporate fraud, accounting scandals, excessive compensation etc., some leading to even bankruptcy of the companies fraught in such mis- governance.

Corporate governance includes a wide array of mechanisms and expectations that are of importance to businesses, the economy, and society. World over economies are dominated by companies of different sizes. How these companies are governed affects not only the shareholders of the companies but also thousands of people who work with such companies, buy products of these companies or are affected by them implicitly. Governance aspects are reflected in acts, rules and regulations, contracts, and in important institutions such as stock exchange listing standards and the audit process.

The components of corporate governance vary by country, over time, and by company type, size, and ownership. Analysts and investors play a very important role in driving good practices and highlighting companies with poor governance practices. There are some important aspects analysts should look for. For example they should also pay attention to the quality of independent directors in a business. Analysts should focus on the qualifications and experiences of these independent directors, how many meetings they attend and what are their contributions to the business. It may be good practice to interact with some of them to understand them better. Good governance practices can also be used as filters for selecting the investment universe.

Chapter 3: Sample Questions

1. _____ industries rise and fall and very closely follow the general economic activity in comparison to other industries.

a) Cyclical
b) Consumer staples
c) Defensive
d) Financial

2. Under the typical assumption that a stock's dividend will grow at a constant rate, what will be the intrinsic value of the stock if D_1=Rs. 3, k = 9%, g=6%?

a) Rs. 95
b) Rs. 105
c) Rs. 110
d) Rs. 100

3. Under relative valuation techniques, value of a stock is estimated based upon its current price relative to variables considered to be significant in valuation, such as _____.

a) Earnings
b) cash flow
c) book value
d) All the above

4. …… ratio compares the price of the stock to the earning it generates.

a) P/E ratio
b) P/B Ratio
c) Price/Cash flow ratio
d) Price/sales ratio

5. Which of the following is an example of trading rules and indicators?

a) Trend-line analysis
b) Moving averages
c) Bollinger-Band Analysis
d) **All the above**

Sample Caselet

1. A company is expected to generate EBIT of Rs.200 crores next year. The estimated depreciation expense next year is Rs.50 crores. The company has a planned CAPEX of Rs.100 crores, also requiring Rs.50 crores towards additional working capital. As a policy the company always finances both CAPEX and working capital with a mix of debt and equity in the ratio of 1:1. The company plans to repay Rs.30 crores of its debt next year, pay Rs. 20 crores as interest, and it is in the marginal tax bracket of 30%. What is the estimated FCFE?
    a) Rs.71 crores
    b) Rs.46 crores
    c) Rs.101 crores
    d) Rs.70 crores

    Answer: a) Rs.71 crores
    Explanation: (200 - 20) * (1 - 0.3) + 50 - 100 - 50 + (75 - 30) = Rs.71 crores
    (EBIT-Interest) *(1-tax rate)+Depreciation-CAPEX-additional Working capital + (Net borrowings)
    Fresh Expenditure =Planned capex + additional working capital = (100+50=150)
    Out of which Debt=75 and Equity=75 (since debt to equity ratio is 1:1)
    Net borrowings=Debt - Repayment of debt

2. The expected FCFE of a firm for the next year is Rs.71 per share. The current market price of this firm's equity share is hovering around Rs.550. The consensus estimate of growth in cashflows into the foreseeable future is 5%. Analysts who follow the company regularly are of the opinion that this company's market beta would be 1.2. The 10 year Govt Bond Yield is 6% and the Indian markets are expected to generate a market risk premium of 8%. (NOTE: All calculations have to be rounded off to 2 decimal places). What is your opinion about the market valuation of this firm's equity share if you adopt the discounted cashflow model and no other perspective of your own?

    a) Undervalued
    b) Overvalued
    c) Correctly Valued
    d) Can't be estimated

    Answer: a) Undervalued
    Explanation: 71 / (0.156 - 0.05) = 669.80; discounting rate = 6 + (1.2 * 8) = 15.6%
    Discount rate: Risk free rate + Beta*(Market risk premium)
    Valuation using discounted cash flow method: FCFE/(discounting rate-growth rate)

CHAPTER 4: INVESTING IN FIXED INCOME SECURITIES

LEARNING OBJECTIVES:

After reading this chapter, the reader should understand about:

- Basic characteristics of fixed income securities
- Components of fixed income securities
- Relationship between bond price and yield
- Alternative yield measure like YTM, Coupon Yield, Current yield
- Interest rate risk
- Duration of the bond

4.1 Overview of Fixed Income Securities

Investors find it less exciting to talk about bonds or fixed income securities (bonds). A typical investor has more focus on equities when it comes to investment discussions. It is an irony because the global total market value of bonds is larger than the total market value of equity. As of 2020, global equity market capitalization was USD 105.8 trillion and global bond market outstanding was US$ 123.5 trillion.[18] Generally, Government is the single largest issuer of bonds. Not only the size but also in terms of number of issues, bonds overtake equities as unlike equity, companies can issue many different bond issues outstanding at the same time. Governments issue bonds of many kinds and varied maturity profile.

In India, the fixed income market is classified on the basis of the entities issuing fixed income securities. Fixed income securities are issued by legal entities such as the Central and State Governments, Public Bodies, Banks and Institutions, statutory corporations and other corporate bodies[19]. The fixed income instruments traded can be classified into the following segments on the basis of the issuer of these securities (Table 4.1):

Table 4.1: Types of Fixed Income Instruments

Market Segment	Issuer
Government Securities	Central Government
	State Governments
Public Sector Bonds	Government Agencies / Statutory Bodies
	Public Sector Undertakings

[18] https://www.sifma.org/wp-content/uploads/2021/07/CM-Fact-Book-2021-SIFMA.pdf

[19] In India, the long-term debt securities issued by the Government of India or any of the State Government's or undertakings owned by them or by development financial institutions are called as bonds. Instruments issued by other entities are called debentures.

Private Sector Bonds	Corporates
	Banks
	Financial Institutions

Government securities or G-Secs, constitute the largest segment of the Indian fixed income market. The next largest section of the rupee-denominated debt market is the corporate bond market. This segment has grown substantially in recent years .

The Indian primary market in corporate debt is basically a private placement market with most of the corporate bond issues being privately placed among the wholesale investors i.e. the banks, financial institutions, mutual funds, large corporate & other large investors. This situation has restricted the retail participation in the bond market. The share of retail investors in corporate bond market is very small.[20]

The issue and trading of fixed income securities by each of these entities are regulated by different bodies in India. Government securities and securities issued by banks, non-banking financial companies (NBFCs) are regulated by the RBI. The issue of non-government securities comprising basically issues of corporate debt is regulated by SEBI.

4.2 Bond Characteristics

Since bonds create fixed financial obligations on the issuers, they are referred as fixed income securities. The issuer of a bond agrees to 1) pay a fixed amount (known as coupon) periodically and 2) repay the fixed amount of principal (known as face value) at the date of maturity. The fixed obligations of the security are the most defining characteristic of bond. Mostly bonds make semi-annual coupon payments, though some may make annual, quarterly or monthly coupon payments. The coupon payment is always calculated as a fixed promised percentage applied on the face value of the bond.

There are however zero coupon bonds which do not make any coupon payments. Typically, a zero coupon bond is issued for less than its face value and the face value is paid on the maturity date. Bonds have fixed maturity date beyond which they cease to exist as a legal financial instrument. Perpetual bonds, which do not have any maturity date exist forever. On the basis of term to maturity, bonds with a year or less than a year maturity are termed as money market securities. Long-term obligations with maturities in excess of 1 year, are referred as capital market securities. Thus, long term bonds as they move towards maturity become money market securities.

The issue price, coupon, maturity period, face value, redemption value are important intrinsic features of a bond. The issue price would define the amount guaranteed capital gain a bond holder would enjoy if the bond is held till maturity. The coupon of a bond indicates the regular

[20]https://content.ftserussell.com/sites/default/files/research/ftse-sbi-indian-bond-index-series-jan-2019-final.pdf

income/coupon income that the bond holder will receive over the life (or holding period) of the bond.

The term to maturity is the time period before a bond matures. All G-Secs are normally coupon bearing and have semi-annual coupon or interest payments with a tenor of between 5 to 30 years. Maturity period is also known as tenor or tenure. Though not found in common, sometimes corporate bonds might promise some premium on redemption, hence making the redemption value different than the face value (or par value)

The face value or par value of the bond is the original value of the obligation. It is similar to the principal on a loan. Face value of the bond is different from bond's market price. This situation can arise when the interest rates prevailing in the market are different than the coupon rate promised on the bond. When coupons and the prevailing market rate of interest are not the same, market price of the bond can be lower or higher than principal value. If the market interest rate is above the coupon rate, the bond will sell at a discount to the par value. If the market rate is below the bond's coupon, the bond will sell at a premium to the par value. This behaviour is mathematically quite intuitive. Let's consider the example below.

Let's imagine that a bond with a face value of Rs.1000 has been issued for a period of 1 year, with a coupon rate of 12% p.a. and the coupon being paid on maturity. At the end of end of 1 year , i.e. on maturity the bond would repay the face value of Rs.1000. Therefore for any one who is interested to invest in this bond would have Rs. 1000 of outflow today and Rs. 1120 (Coupon of Rs.120 and Face Value of Rs. 1000) of inflow at the end of 1 year. Then the return in percentage to any investor who has invested in this bond would be (1120 – 1000) / 1000 = 12%. Because the investment was held for a period of 1 year, then the return is annual return.

Going by the basic tenets of time value of money and compounding an investor who is ready to invest Rs.1000 today and seeks a return of 12% would expected Rs.1120 at the end of 1 year, and hence this bond would exactly match his investment preference. Depicting it mathematically:

1000 * (1.12) ^ 1 = 1120;

where "(1.12)^1" is the future value interest factor, and this is compounding today's cashflow to future date. OTHER WISE it could also be depicted in a discounting format. This approach would help someone to calculate what is the maturity value of an investment which is promising some interest rate.

1120 / (1.12)^1 = 1000;

where "1/(1.12)^1" is the present value interest factor, and it is discounting a future cashflow to today. This approach would help someone to calculate what is the amount that needs to

be invested, in case an investment avenue is promising a definitive cashflow at the end of 1 year. That means an investor seeking 12% return should invest not more than Rs.1000 in this bond which is promising Rs.1120 at the end of 1 year.

Then what should be the maximum amount an investor who seeks 15% p.a. return pay for the same bond?

It would be Rs.1120 / (1.15)^1 = 973.91. Because only this amount would generate him a return of 15% p.a.

In the same manner, an investor who wants only 8% would be ready to pay upto Rs.1120 /(1.08)^1 = 1037.40. An investor is paying either less or more than the face value not because the bonds are different. In fact, the bond characteristics in terms of face value, coupon rate, date of coupon payment, and the date of maturity are all fixed. Therefore the only thing which was making the difference was the expected rate of return.

While the above example was that of an individual investor and the expected rate of return was clear in the investor's mind. What if many investors are participating in a market and bidding for this bond. Logically one consensus interest would naturally emerge when the bond is finally bought or sold. But the issue is that this interest rate is not visible directly. Hence the fixed income markets reverse calculates this hidden or implied expected rate of return in a fixed income security, from its traded prices. This is referred to as "yield".

It should be clear that Yield on a bond is a consensus interest rate that emerged due to the demand and supply forces of the investors in the market, and their required rate of return was definitely influenced by the ongoing government benchmark interest rates. This inverse relationship between interest rates and bond prices as explained above is underlying the bond theorems, that "with all other things remaining the same, an increase in the market interest rates would decrease the prices of fixed income securities".

Another interesting thing about bonds is that unlike equity shares, government or companies can have many different bonds outstanding at the same time, but each of them could have a different maturity period and a coupon rates. These features of the bonds will be part of the indenture.[21] Logically every new issue of a bond by a company would always provide coupon rates according to the then prevailing interest rates in the market rates.

4.2.1 Bonds with options

Bonds can also be issued with embedded options.[22] Some common types of bonds with embedded options are: bonds with call option, bonds with put option and convertible bonds.

[21] Indenture is the legal agreement between two parties, in case of bond indenture the two parties are the bond issuer (borrower) and the investors (lender).

[22] Options are financial derivatives that give buyers the right, but not the obligation, to buy or sell an underlying asset at an agreed-upon price at a future date, where the price is agreed upon today.

A callable bond gives the issuer the right to redeem all or part of the outstanding bonds before the specified maturity date. Callable bonds are advantageous to the issuer of the security but they present investors with a higher level of reinvestment risk than non-callable bonds. The issuer will call the bond before its maturity only when the interest rates for similar bonds fall in market. The investor will receive the face value of the bond before its maturity, and will be forced to reinvest that money for the remaining period lower interest rates. This is called reinvestment risk.

A put provision gives the bondholders the right to sell the bond back to the issuer at a pre-determined price on specified dates. Puttable bonds are beneficial to the bondholder by guaranteeing a pre-specified selling price at the redemption dates.

An optionally convertible bond is a combination of a plain vanilla bond plus an embedded equity call option. It gives the bondholder the right to exchange the bond for a specified number of common shares of the issuing company.

4.3. Determinants of bond safety

Bonds being fixed income securities, are expected to generate a pre-specified stream of cashflows in terms of coupon and principal payment. The previous discussion on return while investing in a bond and the price of a bond, are all dependent on a fundamental assumption, that the bonds are literally default risk free. Meaning the coupon and principal repayment would be as much as promised, and will occur at the same time which is promised. Therefore safety aspects of bonds are tied to their probability of defaulting on these payments or possibility of delaying in the payments. This probability and possibility is the underlying phenomenon of credit risk to which bond holders are exposed. Credit Risk is, the risk of loss resulting when the issuer fails to make full and timely payments of interest and/or repayments of principal.

The most important document to understand the safety aspects of the bond is its indenture. It is the legal agreement between the firm issuing the bond and the bondholders, providing the specific terms of the debt agreement. All the features of the bond i.e. its par value, coupon rate, maturity period, periodicity of coupon payments, collateral for the bond, seniority of the payments will be set forth in the indenture. Indenture also provides information on covenants. Covenants are clauses specifying the rights of the bond holders and restrictions on the bond issuers. Covenants are broadly of two kinds: Positive covenants and Negative covenants. Positive covenants are actions which issuers are required to do, whereas negative covenants specify what issuers are prohibited from doing. These are necessary to protect an investor’s investment in the debt security.

Companies issue different kinds of bonds. Some may be secured against some specified property of the issuer in the case of default. The value of the asset against which the bond is secured determines the quality of the bond. Some bonds are unsecured. These are backed by the promise of the issuer to pay coupon and principal on a timely basis. In such a situation, the credit worthiness of the issuer determines bond quality.

To understand the probability of default by the issuer, most bond investors rely on Rating Agencies. Rating agencies play an integral role in bond markets. These agencies are specialized firms that determine the ability and willingness of the issuers to meet their financial obligations on time and as promised.

The actual level of default risk faced on an investment depends on the financial situation of the borrower. Default risk can be assessed by tracking the credit rating of an investment. Credit rating agencies assign credit ratings after carrying out a detailed analysis of the issuer's financial ability to honour the payments on time. These ratings are in the form of alphanumeric symbols. Rating is given for an instrument and not to a firm; so two different instruments issued by the same firm can have different ratings. The higher the credit rating, the lower is the default risk. SEBI has standardized the rating symbols used by the credit rating agencies so that investors are able to easily gauge the level of credit risk assigned to an instrument. The rating symbols and their definitions are reproduced below in Box 4.1 and Box 4.2.

Rating agencies have their own methodology to gauge the creditworthiness of the issuer and also the probability that the particular instrument will not default. They use symbols to express their opinion. Typically, ratings are expressed as grades from 'AAA' to 'D' to communicate the relative level of credit risk. (See Box 4.1) Bonds with higher credit risk receive a lower credit rating from the bond rating firms and vice versa. Bond markets are also classified on the basis of creditworthiness reflected in the credit rating as investment grade and non-investment grade (speculative) bond market.

4.4. Valuation of Bonds

Since bonds are fixed income securities, generating a series of pre-specified cashflows, their value can be estimated adopting the discounting cashflow approach. The discounting cashflows approach uses the required rate of return of the investor and discounts all the future cashflows received from a bond, to arrive at the intrinsic value of the bond, at a particular point in time. The motivation to arrive at the value of a bond is to compare its intrinsic value with the ongoing market price, just like how an equity share is compared, and then judge whether it is overvalued or undervalued. Therefore, investment decisions in the bonds can also be taken by estimating their intrinsic values. When the intrinsic value of a bond is greater than the ongoing current market price, one could invest in it. Or else, if the investor is already holding the bond, then the bond could be sold.

Alternatively, the investment and disinvestment decisions can also be taken by comparing the implied yield by investing in the bond at the ongoing current market price. If the calculated yield is greater than the required yield or required rate of return of the investor, then the investor can buy the bond. Similarly, if the yield is lesser than what the investor requires, then the bond could be sold. The following sections would discuss these further.

Box 4.1: Credit rating symbols and Definitions for Long Term Instruments
Long term debt instruments: The instruments with original maturity exceeding one year
Rating symbols should have Credit Rating Agency's (CRA's) first name as prefix
AAA - Instruments with this rating are considered to have the highest degree of safety regarding timely servicing of financial obligations. Such instruments carry lowest credit risk.
AA - Instruments with this rating are considered to have high degree of safety regarding timely servicing of financial obligations. Such instruments carry very low credit risk.
A - Instruments with this rating are considered to have adequate degree of safety regarding timely servicing of financial obligations. Such instruments carry low credit risk.
BBB - Instruments with this rating are considered to have moderate degree of safety regarding timely servicing of financial obligations. Such instruments carry moderate credit risk.
BB - Instruments with this rating are considered to have moderate risk of default regarding timely servicing of financial obligations.
B - Instruments with this rating are considered to have high risk of default regarding timely servicing of financial obligations.
C - Instruments with this rating are considered to have very high risk of default regarding timely servicing of financial obligations.
D - Instruments with this rating are in default or are expected to be in default soon.
***Modifiers {"+" (plus) / "-"(minus)} can be used with the rating symbols for the categories AA to C*. The modifiers reflect the comparative standing within the category.**

Box 4.2: Credit Rating Symbols and Definitions for Short Term Debt instruments
Short term debt instruments: The instruments with original maturity of upto one year
Rating symbols should have CRA's first name as prefix
A1 – Instruments with this rating are considered to have very strong degree of safety regarding timely payment of financial obligations. Such instruments carry lowest credit risk.
A2 - Instruments with this rating are considered to have strong degree of safety regarding timely payment of financial obligations. Such instruments carry low credit risk.
A3 - Instruments with this rating are considered to have moderate degree of safety regarding timely payment of financial obligations. Such instruments carry higher credit risk as compared to instruments rated in the two higher categories.
A4- Instruments with this rating are considered to have minimal degree of safety regarding timely payment of financial obligations. Such instruments carry very high credit risk and are susceptible to default.
D - Instruments with this rating are in default or expected to be in default on maturity.
Modifier {"+" (plus)} can be used with the rating symbols for the categories A1 to A4. **The modifier reflects the comparative standing within the category.**

4.4.1. Intrinsic Value of a Bond

The intrinsic value of a bond is the sum of present value of all future cash flows of the bond discounted at a required rate of return.

$$IV_0 = \sum_{t=1}^{n*cf} \frac{Coupon\ Payment_t}{(1+\left(\frac{r}{cf}\right))^t} + \frac{Face\ Value\ or\ Redemption\ Value}{(1+\left(\frac{r}{cf}\right))^{n*cf}}$$

IVo = Intrinsic Value of a Bond

$Coupon_t$ = is the periodic cashflow paid by the bond as promised. It is not the annual payment, but the actual amount that is adjusted to the frequency of coupon payment.

Face Value or Redemption Value = It is the Par value of the bond which is promised to be repaid on the date of maturity. In case the bond promises an amount different than the face value, then it would be termed as redemption value.

r = discount rate which is either the investor's required rate or a comparable bond's yield to maturity calculated at its ongoing market prices. The discounting rate needs to be adjusted to the frequency of coupon payment, so that discounting is in tune with the principle.

t = is the time period when the coupon is paid. It is represented in the form of a digit.

n = the time period when the payment of last coupon and the face value takes place on the date of maturity. It is also represented in the form of a digit adjusted to the frequency of coupon payment.

cf = frequency of coupon payment in the bond. In case the bond pays coupons half-yearly, then the value it takes is 2, quarterly 4, monthly 12 and so on.

It may be noted that whenever a bond paying coupons more than once in a year is being evaluated, then both the discounting rate and the maturity period need to be adjusted accordingly. Where the time period is multiplied with the frequency of coupon payment, and the discounting rate is divided by the frequency of coupon payment.

The above equation needs to be solved using a mathematical calculator and one should be conversant with the aggregation operator used in the equation. Otherwise, the readymade interest rate factors can be used to calculate the intrinsic value. The interest rate factors are available as readymade tables where the rows are the periods and the columns are the discounting rates. Because coupons are annuities and the face value that is repaid at maturity is a lumpsum payment, the following representation can achieve the same objective as shown in the previous equation.

IVo = Coupon Payment (PVIFA r/cf, n*cf) + Face Value or Redemption Value (PVIF r/cf, n*cf)

Where,
PVIFA r, n*cf = It is the **present value interest rate factor for annuity** for discounting rate 'r' and for n * cf coupon payments.

PVIF r, n*cf = It is the **present value interest rate factor** for discounting rate 'r' and for n * cf time period.

Say for instance an investor with an expected rate of 14% p.a. is calculating the intrinsic value of a bond with a face value of Rs.1000, that is offering a semi-annual coupon of 12% p.a., and which has a remaining term to maturity of 5 years. The bond would be worth Rs.1000 at maturity. The intrinsic value of the bond can be calculated using the equation and the present value interest factors as follows.

$$IV_0 = \sum_{t=1}^{5*2} \frac{60_t}{(1+0.14/2)^t} + \frac{1000}{(1+0.14/2)^{5*2}}$$

Solving this would yield the answer 929.72. This can also be calculated using the interest rate factors as follows:

IVo = 60 (PVIFA $_{14\%/2,\ 5\ *\ 2}$) + 1000 (PVIF$_{14\%/2,\ 5\ *\ 2}$)

That is = 60 * (7.0236) + 1000 * (0.5083) = 421.42 + 508.30 = 929.72

Therefore the intrinsic value of the bond with the above face value, maturity date, and coupon payment is Rs.929.72. It may be noted that the value is lesser than the face value. This is in tune with the inverse relationship between interest rates and price of the bond discussed in the earlier paragraphs. Because the bond is paying a coupon of only 12% p.a., but the investor requires 14% p.a., based on the ongoing market interest rates, or the investor's personal risk appetite or perception, the bond is not worth the face value, but something lesser than that.

The intrinsic value of a bond can be also calculated using the excel "PRICE" function in the MS Excel as illustrated in Illustration 4.1. The intrinsic value of the same bond that is used the example above is also used for the illustration. The table represents the sheet in excel and columns A and B can be related to that in the excel sheet. The letters in red in column A exactly represent the inputs (according to syntax) of the "PRICE" function in MS Excel, and the values in column B need to be given as inputs into MS Excel to get the answer. The black letters in column A in parenthesis are explanations to understand what does the word in red colour mean. The column B in the last shows the syntax for the MS Excel function to be used to get the answer for the intrinsic value of a bond.

There might be a point of confusion when the words "YIELD" and "PRICE" are used in the function. However the clarity is "YIELD" should be considered as the required rate of return of the investor and not "YIELD TO MATURITY" of the bond. Similarly "PRICE" is the final output one would get, which is the intrinsic value of the bond at the required rate of return and not the "ONGOING CURRENT MARKET PRICE"

Illustration 4.1: Calculating Intrinsic Value of a Bond in excel

A	B
Settlement (the date on which the valuation is being done)	01-01-2022
Maturity (the date of maturity reckoned from date of valuation)	01-01-2027
Rate (Coupon rate depicted on per annum basis)	12%
Yield (Discount rate applied or required rate of return of the investor)	14%
Redemption (The value proportionately expressed per Rs.100)	100
Frequency (It takes a number 1 for yearly, 2 for half-yearly, 4 for quarterly, 12 for monthy)	2
Basis (indicates the day count convention that is used [**Day count basis:** 0 or omitted = US (NASD) 30/360; 1 = Actual/actual; 2 = Actual/360; 3 = Actual/365; 4 = European 30/360)	0

PRICE (The intrinsic value of a bond, which would be the answer) the result in column should be multiplied by 10, because the answer is for a bond with face value of Rs.100, and the face value of the bond in our illustration is Rs.1000. The values in column B would result into an answer 929.76 (Please input the values in MS Excel and verify by doing it yourself)	=PRICE(Settlement, Maturity, Rate, Yield, Redemption, Frequency, Basis)

4.4.2. Bond Yield Measures

Bond holders receive return from one or more of the following sources, when they buy bond:

1. The coupon payments made by the issuer;
2. The capital gain (or capital loss) when the bond is sold/matured; and
3. Income from reinvestment of the interest payments that is interest-on-interest.

There are yield measures commonly used to measure the return from investing in a bond are briefly described below:

Coupon Yield:

The coupon yield is the coupon payment as a percentage of the face value. It can be considered as a nominal interest payment on a fixed interest bond.

Coupon yield = (Coupon Payment / Face Value) * 100

Illustration:

Coupon: Rs. 8.24; Face Value: Rs. 100; Market Value: Rs. 103.00; Coupon yield = 8.24/100 = 8.24%

Current Yield:

The current yield is the coupon payment as a percentage of the bond's current market price.

Current yield = (Annual coupon rate / current market price of the bond) *100%

Illustration:

The current yield for a 10 year 8.24% coupon paying bond selling for Rs. 103.00 with a face value of Rs. 100 is calculated as below:

Annual coupon interest = 8.24% x Rs. 100 = ₹8.24

Current yield = (8.24/103) X 100 = 8.00%

Yield to Maturity:

Yield to Maturity (YTM) is that rate which discounts the future cash flows from a bond, and makes the sum of the present values of such cashflows equal to the current market price of the bond. It is the rate of return that can be expected in a bond investment, when purchased at the ongoing market price, and when it is held until its maturity. YTM can also be considered as the Implied Rate of Return, or Internal Rate of Return of the bond. Mathematically, when we substitute the IVo in the formula of intrinsic value of a bond with the current market price (Po), and then solve it to extract the 'r', then that 'r' would be the YTM.

$$P_0 = \sum_{t=1}^{n*cf} \frac{Coupon\ Payment_t}{(1 + r/cf)^t} + \frac{Face\ Value\ or\ Redemption\ Value}{(1 + r/cf)^{n*cf}}$$

P_o= Current Market Price of the of bond

All other variables are same as explained in the previous sections. Again a word of caution, that if the frequency of coupon payment is more than once in an year, then accordingly the 'r' that is extracted needs to be annualised by multiplying with the frequency of coupon payment. For instance if the solved 'r' is 5% for a semi-annual coupon paying bond, then YTM per annum basis would be 5% * 2 = 10%.

The calculation of YTM involves a trial-and-error procedure. Therefore one has to try by using different values in the 'r' and try to equate it to the current market price using the calculator. Because very rarely does a rate without decimal match the true YTM, so extrapolation is required to arrive at the accurate YTM. Instead MS Excel has a function 'YIELD' which calculates the YTM of a bond, given all its details and the current market price, for a face value of Rs.100. Continuing the above example used to calculate the intrinsic value, and by considering the current market price of the bond to be Rs.975, the YTM would be calculated in MS Excel as shown in illustration 4.2.

Illustration 4.2: Calculating Yield to Maturity of a Bond in excel

A	B
Settlement (the date on which the bond is going to be purchased)	01-01-2022
Maturity (the date of maturity reckoned from date of purchase)	01-01-2027
Rate (Coupon rate depicted on per annum basis)	12%
Price (Current Market Price of the Bond, expressed per Rs.100)	97.5
Redemption (The value proportionately expressed per Rs.100)	100
Frequency (It takes number 1 for yearly, 2 for half-yearly, 4 for quarterly, 12 for monthly)	2

Basis (indicates the day count convention that is used [**Day count basis:** 0 or omitted = US (National Association of Securities Dealers NASD) & INDIA 30/360; 1 = Actual/actual; 2 = Actual/360; 3 = Actual/365; 4 = European 30/360) [see box 4.3 for Day count convention]	0
YIELD (The Yield to Maturity would be 12.69%, when the cell is formatted to percentage with two decimals. (Please input the values in MS Excel and verify by doing it yourself)	=YIELD(Settlement, Maturity, Rate, Price, Redemption, Frequency, Basis)

Box 4.3: Day Count convention

Day count convention refers to the method used for arriving at the holding period (number of days) of a bond to calculate the accrued interest. As the use of different day count conventions can result in different accrued interest amounts, it is appropriate that all the participants in the market follow a uniform day count convention.

For example, the conventions followed in Indian market for bonds is 30/360, which means that irrespective of the actual number of days in a month, the number of days in a month is taken as 30 and the number of days in a year is taken as 360.

Whereas in the money market the day count convention followed is actual/365, which means that the actual number of days in a month is taken for number of days (numerator) whereas the number of days in a year is taken as 365 days. Hence, in the case of T-Bills, which are essentially money market instruments, money market convention is followed.

In some countries, participants use actual/actual, some countries use actual/360 while some use 30/actual. Hence the convention changes in different countries and in different markets within the same country (e.g. Money market convention is different than the bond market convention in India).

As previously discussed when market interest rates rise, the prices of a bonds fall. Conversely, if the market interest rates decline, the prices of bonds rise. In other words, the yield of a bond is inversely related to its price. The relationship between yield to maturity and coupon rate of bond may be stated as follows:

- When the market price of a bond is less than its face value, i.e., the bond is selling at a discount, then YTM would be > Coupon Yield.
- When the market price of a bond is more than its face value, i.e., the bond is selling at a premium, then YTM would be < Coupon Yield .
- When the market price of a bond is equal to its face value, i.e., the bond is selling at par, then YTM would be = Coupon Yield.

Yield to call

In the case of bonds with an embedded call feature another measure of Yield is also popularly calculated by the markets along with Yield to Maturity. It is known as Yield to Call. The name comes from the entitlement retained by the issuing entity to repay amounts on the bond prior to its maturity. The amount repaid might not be equal to the face value, because it is being paid prior to the date of maturity. Depending on the market interest rates forecasted by the issuer, the amount repaid, in a call may be higher or lower than the face value(par value). The price and date at which a bond can be called is mentioned at the time of issue. and it is referred to as "Call Price". Sometimes the issuing entities give a schedule of dates along with their respective Call Prices, when the decision to call can be taken any time within a given range of dates. Yield to call measures the estimated rate of return for bond held till the first call date. The formula used to calculate the Yield to Maturity can be used to calculate the Yield to Call too. In this formula the "Face Value or Redemption Value" variable is substituted with "Call Price". Then 'n' in the equation can be taken as the period till the date of the first call. Usually when there is nothing mentioned specifically, then the first call date is considered as the date on which Call would happen, and the Yield to Call at this date is calculated.

$$P_0 = \sum_{t=1}^{n*cf} \frac{Coupon\ Payment_t}{(1 + r/cf)^t} + \frac{Call\ Price}{(1 + r/cf)^{n*cf}}$$

Every other term in the equation means the same as discussed above.

For instance, a 20 year old bond paying 12% coupon, semi-annually, and redeeming at par value of Rs.1000 is currently selling at Rs. 1180. Suppose the first call date is 8 years from today, and the issuer is going to call it at Rs. 1050, then the r which will equate the cashflows to the current market price would be the Yield to Call.

$$1180 = \sum_{t=1}^{8*2} \frac{60}{(1 + r)^t} + \frac{1050}{(1 + r)^{8*2}}$$

The same can be solved easily with MS Excel by using the tweaking the "Yield Function" as shown in illustration 4.3.

Illustration 4.3: Calculating Yield to Call of a Bond in excel

A	B
Settlement (the date on which the bond is going to be purchased)	01-01-2022
Maturity (the date of maturity reckoned from date of purchase)	01-01-2030
Rate (Coupon rate depicted on per annum basis)	12%
Price (Current Market Price of the Bond, expressed per Rs.100)	118
Redemption (The value proportionately expressed per Rs.100)	105

Frequency (It takes number 1 for yearly, 2 for half-yearly, 4 for quarterly, 12 for monthly)	2
Basis (indicates the day count convention that is used [**Day count basis:** 0 or omitted = US (NASD) & INDIA 30/360; 1 = Actual/actual; 2 = Actual/360; 3 = Actual/365; 4 = European 30/360)	0
YIELD (The Yield to Call would be 9.21%, when the cell is formatted to percentage with two decimals.	=YIELD(Settlement, Maturity, Rate, Price, Redemption, Frequency, Basis)

4.5 Measuring Price Volatility of bonds

Market price of a bond is a function of four factors: (1) Face Value (Par value) of the bond; (2) Coupon rate of the bond; (3) Maturity period i.e. no. of years to maturity and (4) Prevailing market interest rate.

There are mathematical proofs that demonstrate the following relationships between yield (interest rate) changes and bond price behaviour:

1. Bond prices and the interest rates have inverse relationship.
2. Bond price volatility is inversely related to coupon. Bonds with higher coupons show smaller percentage price fluctuation for a given change in interest rates . For example, if many bonds with same maturity period of 10 years are taken, experiencing the same change in interest rates by say +1% , the smaller coupon bond will experience the larger percentage price change. If a zero coupon bond is also included in the example, it will experience the largest percentage price change.
3. Bond price volatility is directly related to term to maturity, longer maturity bonds experience larger price changes for a given change in yields. Bond price volatility increases at a diminishing rate as the term to maturity increases.
4. Bond price movements resulting from equal absolute increases or decreases in yield are not symmetrical. A decrease in yield raises bond prices by more than an increase in yield of the same amount lowers prices.

4.5.1. Interest rate risk

Interest Rate Risk is defined as the risk emanating to bond holders from changes in the market interest rates. As discussed above, market price of the bond reflects the present value of all future cash flows of the bond. The discount rate used to calculate the present value is the function of prevailing interest rates over various maturities. If the interest rate in the economy increases, the discounting factor to find out the present value of the future cash flows also increases, resulting in the fall in the value of the bond.

A related concept to interest rate risk is reinvestment rate risk. Reinvestment risk is when the investor may not be able to reinvest the intermittent cash flows (coupons) at yields prevalent at the time of making the investment due to either decrease or increase in interest rates prevailing at the time of receipt of cash flows by investors. Yield to maturity computation implicitly assumes that all coupon cash flows will be reinvested at yield to maturity. If, after the purchase of the bond, interest rates decline, the coupon cash flows will be reinvested at rates below the yield to maturity. Conversely, if interest rates increase, the coupon cash flows will be reinvested at rates above yield to maturity.

4.5.2. Concept of Duration

One of the popular measures of measuring interest rate risk in a bond is Macaulay's Duration and another derived indicator from it is Modified Duration. By construct Macaulay's Duration is expressed in number of years. Hence the popular understanding that Duration is some kind of time period in which the bond investor would recoup the initial investment, from the cashflows from the bond. However theoreticians caution this interpretation of Duration. Alternatively they suggest, that it could be transformed into a good measure of price sensitivity of a Bond for a given change in the market interest rates, yields, or required rates of return of the bond investor(Modified Duration). Duration also shares the same properties of a bond as discussed in the Price Volatility segment in Section 4.5.1

Modified Duration is calculated as

Macaulay's Duration in Years / (1 + YTM adjusted to frequency of coupon payment)

Say for instance the Macaulay's Duration is 5 years and the YTM p.a. is 12%, and the frequency of coupon payment is half-yearly. Then the Modified Duration is

5 / (1 + 0.12/2) OR 5 / (1.06) = 4.72

The approximate change in price of a bond for a given change in market interest rates can be estimated using the modified duration as follows

% change in the price = - Modified Duration * Change in market interest rates in decimals.

Therefore modified duration is more like an elasticity coefficient without any units of measurement, unlike Macaulay's duration, which is measured in years. Continuing the above example, if the modified duration of a bond is 4.72 and there is a change in the market interest rates or yields from 2.5% to 2.7%. The expected percentage change in the price of the bond will be

- 4.72 * 0.002 = - 0.944%. i.e. due to the negative relationship between interest rates and the bond prices, an increase in interest rates would decrease the prices of the bond.

4.5.2.1. Determining Macaulay's Duration

Duration (also known as Macaulay Duration) of a bond is popularly known as a measure of time taken to recover the initial investment in present value terms. Duration is expressed in number of years. Based on the calculation involved, it is interpreted as Weighted Average Time to recover the initial investment in the bond (the current market price). It is always less than or equal to the overall life (to maturity) of the bond in years. Only a zero coupon bond (a bond with no coupons) will have duration equal to its remaining maturity. Theoreticians also believe that the price sensitivity of a bond to changes in interest rates can be approximated by the bond's duration. The significance of duration is that greater the duration, more volatile is bond's price or return on bond investment, for given changes in the level of interest rates. Duration of a bond can be calculated in two ways one is Manually and the other using MS Excel

Calculating Duration in MS Excel:

Duration can be calculated in MS Excel using the "DURATION" function in the finance functions. The syntax is = DURATION (Settlement date, Maturity date, Coupon Rate, Yield to Maturity, Frequency of Coupon payments, Basis)

Illustration 4.4: A bond is currently selling at Rs.1168.51 generating a yield to maturity of 9%, when the bond is paying a coupon of 12%, its face value is Rs.1000, and the balance term to maturity is 8 years. The YTM of the bond can be calculated as 9% p.a., using the bond data.

A	B
Settlement (the date on which the bond is going to be purchased)	01-01-2022
Maturity (the date of maturity reckoned from date of purchase)	01-01-2030
Rate (Coupon rate depicted on per annum basis)	12%
Yield (Yield to Maturity at Current Market Price of the bond)	9%
Frequency (It takes number 1 for yearly, 2 for half-yearly, 4 for quarterly, 12 for monthly)	2
Basis (indicates the day count convention that is used [**Day count basis:** 0 or omitted = US (NASD) & INDIA 30/360; 1 = Actual/actual; 2 = Actual/360; 3 = Actual/365; 4 = European 30/360)	0
DURATION (The answer is in years, and it will be 5.569 years)	=YIELD(Settlement, Maturity, Rate, Yield, Frequency, and Basis)

Manual Calculation of Macaulay's Duration of Bond: To calculate the duration of a bond, one needs the current market price, the coupon rate, the face value of the bonds, the balance term to maturity, and the YTM of the bond at the ongoing market price, and the frequency of coupon payment. Later the following step by step approach can be followed to arrive at the Duration of the bond.

1. Calculate the YTM of a bond using the current market price, balance term to maturity, coupon rate, and face value, and the final redemption value (Usually at par)
2. Calculate the coupons for each time period when the bond pays the coupons, till the bond's maturity date
3. Arrive at the present values of the coupons and the final repayment value of the bond, using the interest rate factors calculated using YTM adjusted for the frequency of coupon payment.
4. Now multiply each of the cashflow at each point in time, with the digit representing the time when the cashflow is received. For instance, when calculating the duration of a semi-annual coupon paying bond with remaining life of 5 years, the digits representing the time periods would be 1 to 10.
5. Add all the products of the present value of cashflows and their respective time periods.
6. Finally divide the sum of the weighted present value of cashflows with the current market price of the bond. This gives the Duration in days.

Time	Coupon/Cashflow	PV interest factor @ 4.5%	PV of Coupons/Cashflows	Time * PVCFs
1	Rs.60	0.9569	57.4163	57.4163
2	Rs.60	0.9157	54.9438	109.88
3	Rs.60	0.8763	52.5778	157.733
4	Rs.60	0.8385	500.3137	201.255
5	Rs.60	0.8024	48.1471	240.735
6	Rs.60	0.7679	46.0737	276.442
7	Rs.60	0.7348	44.0897	308.628
8	Rs.60	0.7032	42.1911	337.529
9	Rs.60	0.6729	40.3743	363.368
10	Rs.60	0.6439	38.6357	386.357
11	Rs.60	0.6162	36.9719	406.691
12	Rs.60	0.5897	35.3798	424.558
13	Rs.60	0.5643	33.8563	440.132
14	Rs.60	0.5399	32.3984	453.577
15	Rs.60	0.5167	31.0032	465.048
16	Rs.60	0.49447	29.6682	474.691
16	Rs.1000	0.49447	494.47	7911.52
		Total	1168.51	13015.60

Sum of PV of Cashflows = 1168.51 (Which is nothing but the current market price)
Sum of Weighted PV of Cashflows = 13015.60
Duration = (Sum PV of Weighted Cashflows / Sum of PV of Cashflows) / Frequency of Coupon Payment

Macaulay's Duration = (13015.60 / 1168.51) / 2 = 5.569 yrs (We can see that both manual and MS Excel answers are the same).
Modified Duration = 5.569 Years / (1.0450) = 5.33

Chapter 4: Sample Questions

1) Government securities carry practically no risk of_____ and, hence are called risk-free or gilt-edged instruments.

a) Tradability
b) liquidity
c) default
d) negotiability

2) _____ risk arises from the fact that income flows received from an investment at the coupon rate may not be able to earn the same interest.

a) Re-investment
b) Default risk
c) Credit risk
d) None of the above

3) The feature that allows the issuing firms to retire the bonds before the maturity by paying a prescribed price is called _____.

a) Callability (call option)
b) Putability (put option)
c) Convertibility
d) Redemption

4) Typical putability (put option) feature of a bond _____.

a) Gives the bond holders the option to convert the bond into another security, typically the common stock of the firm issuing the convertible bonds
b) Gives the holder the right, under certain circumstances to sell the bond back to the issuer
c) Allows the issuing firms to retire the bonds before the maturity by paying a prescribed price
d) Allows the investor to redeem the bond

Sample Caselets

1. A bond with a face value of Rs.1000 is currently sold at Rs.950. The coupon of this bond is 12%, which is paid once in a year, and the balance term to maturity of this bond is 10 years. If it has a callable feature and its first call can be invoked at the end of 7 years at a premium of 5% on the face value, then what is the Yield to Call of this bond?

a) 13.62%
b) 13.2%
c) 12.28%
d) 12.49%

Answer: a) 13.62%
Explanation: YIELD (Settlement, Maturity, Coupon Rate, Current Market Price, Call Price, Frequency of Coupon Payment, Day Count Convention)

2. A bond with a face value of Rs.1000 is currently sold at Rs.975. The coupon of this bond is 8%, which is paid twice a year. If the bond is going to be redeemed at the end of 10 years at a premium of 5% on the face value, then what is the Yield to Maturity of this bond?

a) 8.70%
b) 8%
c) 9.02%
d) 8.72%

Answer: a) 8.70%
Explanation: YIELD (Settlement, Maturity, Coupon Rate, Current Market Price, Redemption Price, Frequency of Coupon Payment, Day Count Convention)

3. A bond with a face value of Rs.1000 is currently sold at Rs.950. The coupon of this bond is 12%, which is paid once a year. If the bond is going to be redeemed at the end of 10 years at a premium of 5% on the face value, then what is the Duration of this bond?

a) 6.20 years
b) 5.8 years
c) 7 years
d) 8.5 years

Answer: a) 6.20 years
Explanation: Initially using the details, the YTM has to be found out later using this YTM in the Yield variable of the EXCEL function DURATION (Settlement, Maturity, Coupon Rate, Yield, Frequency of Coupon Payment, Day Count Convention)

4. A portfolio manager receives a mandate to manage funds of a trust requiring 14% return per annum. Keeping in view the risk appetite of the trust, the portfolio manager identifies two bonds A and B for investment. They are currently priced at Rs.880 and Rs.1000 respectively. Both bonds have a face value of Rs.1000, have similar number of years to maturity of 10 years, and are going to be redeemed at 5% premium, but have differing coupon rates of 11%(A) and 15%(B), which are paid once in a year. Which of the bonds was overvalued when the portfolio manager purchased them?

a) Bond A
b) Bond B
c) Both of them
d) None of them

Answer: a) Bond A
Explanation: Calculate the intrinsic value of the Bonds using PRICE function of EXCEL and then compare with the current market price PRICE (Settlement, Maturity, rate, yield redemption, frequency, [basis])

CHAPTER 5: DERIVATIVES

LEARNING OBJECTIVES:

After reading this chapter, the reader should understand about:

- Underlying concepts in derivatives
- Types of derivative products
- Structure of derivative markets
- Purpose of Derivatives
- Costs, benefits and risk of derivatives

5.1 Definition of Derivatives

Derivative is a contract or a product whose value is derived from value of some other asset known as underlying. Derivatives are based on wide range of underlying assets. These include:

- Metals such as gold, silver, aluminum, copper, zinc, nickel, tin, lead etc.
- Energy resources such as oil (crude oil, products, cracks), coal, electricity, natural gas, etc.
- Agri commodities such as wheat, sugar, coffee, cotton, pulses etc.
- Financial assets such as shares, bonds and foreign exchange.

In the Indian context the Securities Contracts (Regulation) Act, 1956 [SC(R)A] defines "derivative" to include-

1. A security derived from a debt instrument, share, loan whether secured or unsecured, risk instrument or contract for differences or any other form of security.
2. A contract which derives its value from the prices, or index of prices, of underlying securities.

Derivatives are securities under the SC(R)A, 1956 and hence the trading of derivatives is governed by the regulatory framework under the SC(R)A, 1956.

The term derivative has also been defined in section 45U(a) of the RBI act 1934 as follows:

An instrument, to be settled at a future date, whose value is derived from change in interest rate, foreign exchange rate, credit rating or credit index, price of securities (also called “underlying”), or a combination of more than one of them and includes interest rate swaps, forward rate agreements, foreign currency swaps, foreign currency-rupee swaps, foreign currency options, foreign currency-rupee options or such other instruments as may be specified by RBI from time to time.

5.2 Types of derivative products

The four commonly used derivative products are:

- Forwards
- Futures
- Options
- Swaps

5.2.1 Forwards

Forward contract is an agreement made directly between two parties to buy or sell an asset on a specific date in the future, at the terms decided today. Forwards are widely used in commodities, foreign exchange, equity and interest rate markets.

Let us understand with the help of an example. What is the basic difference between cash market and forwards? Assume on March 9, 2018 you wanted to purchase gold from a goldsmith. The market price for gold on March 9, 2018 was Rs.30,425 for 10 gram and goldsmith agrees to sell you gold at market price. You paid him Rs.30,425 for 10 gram of gold and took gold. This is a cash market transaction at a price (in this case Rs.30,425) referred to as spot price.

Now suppose you want to agree to buy gold on March 9, 2018, but take delivery of the same and pay for the same only after 1 month. Goldsmith quotes you Rs. 30,450 for 10 grams of gold to be delivered after 1 month. You agree to the forward price for 10 grams of gold and go away. There is no exchange of money or gold on March 9th, 2018. After 1 month, you come back to the goldsmith pay him Rs.30,450 and collect your gold. This is a forward, where both the parties are obliged to go through with the contract irrespective of the value of the underlying asset (in this case gold) at the point of delivery. Here, in this example, you have bought forward or you are ***long forward***, whereas the goldsmith has sold forwards or ***short forwards***.

In other words, Forwards are bilateral over-the-counter (OTC) transactions where the terms of the contract, such as price, quantity, quality, time and place are negotiated between two parties to the contract. Any alteration in the terms of the contract is possible if both parties agree to it. Corporations, traders and investing institutions extensively use OTC transactions to meet their specific requirements. The essential idea of entering into a forward is to fix the price and thereby avoid the price risk. Thus, by entering into forwards, one is assured of the price at which one can buy/sell an underlying asset.

5.2.1.1 Major limitations of forward contracts

Liquidity Risk

As forwards are tailor made contracts i.e. the terms of the contract are according to the specific requirements of the parties, other market participants may not be interested in these contracts. Forwards are not listed or traded on exchanges, which makes it difficult for other market participants to easily access these contracts or contracting parties.

Counterparty risk:

Counterparty risk is the risk of an economic loss from the failure of counterparty to fulfil its contractual obligation. For example, A and B enter into a bilateral agreement, where A will purchase 100 kg of rice at Rs.20 per kg from B after 6 months. Here, A is counterparty to B and vice versa. After 6 months, if price of rice is Rs.30 in the market then B may forego his obligation to deliver 100 kg of rice at Rs.20 to A. Similarly, if price of rice falls to Rs.15 then A may purchase from the market at a lower price, instead of honouring the contract. Thus, a party to the contract may default on his obligation if there is incentive to default. This risk is also called default risk or credit risk.

In addition to the illiquidity and counterparty risks, there are several issues like lack of transparency, settlement complications as it is to be done directly between the contracting parties. Simple solution to all these issues lies in bringing these contracts to the centralized trading platform. This is what futures contracts do.

5.2.2 Futures

Futures markets were innovated to overcome the limitations of forwards. A futures contract is an agreement made through an organized exchange to buy or sell a fixed amount of a commodity or a financial asset on a future date at an agreed price.

Simply, futures are standardised forward contracts that are traded on an exchange. Exchange becomes counterparty to both buyer and seller of a futures contract through a clearing house. Futures create an obligation on both buyer and seller's part. The terms of the contract are specified by the exchange and are subjected to change as and when necessary. The clearing corporation associated with the exchange guarantees settlement of these trades. A trader, who buys futures contract, takes a long position and the one, who sells futures, takes a short position. The words buy and sell are figurative only because no money or underlying asset changes hand, between buyer and seller, when the deal is signed.

Features of futures contract

In futures market, exchange decides all the contract terms of the contract other than price. Accordingly, futures contracts have the following features:

- Contract between two parties is through Exchange
- Centralised trading platform i.e. exchange
- Price discovery through free interaction of buyers and sellers
- Margins are payable by both the parties
- Quality decided today (standardized)
- Quantity decided today (standardized)

5.2.3 Options

An Option is a contract that gives its buyers the right, but not an obligation, to buy or sell the underlying asset on or before a stated date/day, at a stated price, for a premium (price). The party taking a long position i.e. buying the option is called buyer/ holder of the option and the party taking a short position i.e. selling the option is called the seller/ writer of the option. The option buyer has the right but no obligation with regards to buying or selling the underlying asset, while the option writer has the obligation to its commitment in the contract.

Therefore, option buyer/ holder will exercise his option only when the situation is favourable to her, but, when she decides to exercise, option writer is legally bound to honour the contract. Options are of mainly two types—call and put option.

Option, which gives buyer a right to buy the underlying asset, is called Call option and the option which gives buyer a right to sell the underlying asset, is called Put option.

Option Terminology

Arvind buys a call option on the Nifty index from Salim, to buy the Nifty at a value of Rs.10,000, three months from today. Arvind pays a premium of Rs.100 to Salim. What does this mean?

- Arvind is the buyer of the call option.
- Salim is the seller or writer of the call option.
- The contract is entered into today, but will be completed three months later on the settlement date.
- Rs.10,000 is the price Arvind is willing to pay for Nifty, three months from today. This is called the strike price or exercise price.
- Arvind may or may not exercise the option to buy Nifty at Rs.10,000 on the settlement date.

- But if Arvind exercises the option, Salim is under the obligation to sell Nifty at Rs. 10,000 to Arvind.
- Arvind pays Salim Rs.100 as upfront payment. This is called the option premium. This is also called as the price of the option.
- On the settlement date, Nifty is at Rs.10,200. This means Arvind's option is "in-the-money." He can buy the Nifty at Rs.10,000, by exercising his option.
- Salim earned Rs.100 as premium, but lost as he has to sell Nifty at Rs.10,000 to meet his obligation, while the market price was Rs.10,200.
- On the other hand, if on the settlement date, Nifty is at Rs.9,800, Arvind's option will be "out-of-the-money."
- There is no point paying Rs.10,000 to buy the Nifty, when the market price is Rs.9,800. Arvind will not exercise the option. Salim will retain the Rs.100 he collected as premium.

The options can be given names like In-The-Money, At-The-Money, and Out-of-The-Money, depending on whether the strike price of the option is greater, equal, or lesser than the underlying asset's market price, respectively. When the underlying asset's price is greater than the strike price, in the case of a call option, the investor would benefit by exercising the option and buy the asset at the strike price, and immediately sell it in the market at a higher price to enjoy the gain. In the same manner there is no gain in the case of At-The-Money and there would be a loss in the case of Out-Of-the-Money.

Similarly, there are two connotations of value, namely intrinsic value and time value. Time value is the excess price a buyer of an option is ready to pay over and above the intrinsic value of that option. This is with an intention that the value of the option would increase in the future, especially when there is adequate time for maturity. Intrinsic value is the excess of the current price over and above the strike price. Essentially In-The-Money options have positive intrinsic value and hence can generate gains for option holders.

Option Premium = Time Value + Intrinsic Value;
Time Value = Option Premium – Intrinsic Value

5.2.4 Swaps:

A swap is a contract in which two parties agree to a specified exchange of cash flows on a future date(s). Interest Rate Swaps and Currency Swaps are most common swaps.
Example:

A borrower has to pay a quarterly interest rate defined as the Treasury bill rate on that date, plus a spread. This floating rate interest payment means that the actual obligation of the

borrower will depend on what the Treasury bill rate would be on the date of settlement. The borrower however prefers to pay a fixed rate of interest.

She can use the interest rate swap markets to get into the following swap arrangement:

- Pay a fixed rate to the swap dealer every quarter
- Receive T-bill plus spread from the swap dealer every quarter

The swap in this contract is that one party pays a fixed rate to the other, and receives a floating rate in return. The principal amount on which the interest will be computed is agreed upon between counterparties and is never exchanged. Only the interest rate on this amount is exchanged on each settlement date (every quarter) between counterparties. The principal amount is also known as notional amount.

The borrower will use the floating rate that she has received from the swap market and pay the floating rate dues on her borrowing. These two legs are thus cancelled, and her net obligation is the payment of a fixed interest rate to the swap dealer. By using the swap market, the borrower has converted his floating rate borrowing into a fixed rate obligation.

Swaps are very common in currency and interest rate markets. Though swap transactions are OTC, they are governed by rules and regulations accepted by Swap Dealer Associations. In India, we have Fixed Income Market and Derivatives Association of India(FIMMDA). It is an association of commercial banks, financial institutions and primary Dealers. FIMMDA is a voluntary market body for the bond, money and derivatives markets.

The objectives of FIMMDA are:

1. To function as the principal interface with the regulators on various issues that impact the functioning of bond, money and derivative markets.
2. To undertake developmental activities, such as, introduction of benchmark rates and new derivatives instruments, etc.
3. To provide training and development support to dealers and support personnel at member institutions.
4. To adopt/develop international standard practices and a code of conduct in the above fields of activity.
5. To devise standardized best market practices.
6. To function as an arbitrator for disputes, if any, between member institutions.
7. To develop standardized sets of documentation.
8. To assume any other relevant role facilitating smooth and orderly functioning of the said markets.

5.3 Structure of derivative markets:

A derivative market is formed when different market players interested to manage their price risks come together and try to secure themselves from the prospective risks that they fear.

In India, the following derivative products are available on various stock exchanges:

- Equity index options
- Equity index futures
- Individual stock options
- Individual stock futures
- Currency options and futures on select currency pairs
- Interest rate futures
- Commodity futures for a select set of commodities

Apart from the above, forward markets for agricultural commodities and swap markets for interest rates are available in the OTC markets.

OTC Markets

Some derivative contracts are settled between counterparties on terms mutually agreed upon between them. These are called over the counter (OTC) derivatives. They are non-standard and they depend on the trust between counterparties to meet their commitment as promised. These are prevalent only between institutions, which are comfortable dealing with each other.

Exchange Traded Markets

Exchange-traded derivatives are standard derivative contracts defined by an exchange, and are usually settled through a clearing house. The buyers and sellers maintain margins with the clearing-corporations, which enables players that do not know one another (anonymous) to enter into contracts on the strength of the settlement process of the clearing house. Forwards are OTC derivatives; futures are exchange-traded derivatives.

5.4 Purpose of Derivatives

A derivative is a risk management product used commonly in financial investments where there is market based price risk resulting in an unknown future value of the investment. Derivatives are typically used for three purposes—Hedging, Speculation and Arbitrage.

Hedging

When an investor has an investment in any asset or portfolio of assets, and further she also has a desired return or any specific investment objective, then she can use the derivative markets to protect the desired value of that investment from the risk of future price movements.

Speculation

A speculative trade in a derivative is not supported by an underlying existing investment in asset or portfolio. It simply involves implementation of an investment or trading strategy based on a view about the future prices of the relevant asset underlying the specific derivative product. For instance, a buyer of a futures contract carries the view that the price of the underlying asset would move up, and she would gain having bought the futures contract at a lower price, as of now, because such a view is not reflecting in the current futures price. In the process the investor has to bear the cost of this long position, which is related to cost incurred in the management of margins required in the futures contracts.

Arbitrage

The law of one price states that two goods (assets) that are identical, cannot trade at different prices in two different markets. If not, one would buy from the cheaper market and sell at the costlier market, and make riskless profits. However, such buying and selling itself will reduce the gap in prices. The demand in the cheaper market will increase prices there and the supply into the costlier market will reduce prices, bringing the prices in both markets to the same level. Arbitrageurs are specialists who identify such price differential in two markets and indulge in trades that reduce such differences in price. Prices in two markets for the same tradable asset will be different only to the extent of transaction costs. These costs can include transportation, storage, insurance, interest costs and any other cost that impacts the activities of buying and selling.

5.5 Commodity and Currency Futures and Options

The basic concept of a derivative contract remains the same for all the underlying assets, whether the underlying happens to be a commodity or currency. When the underlying asset is a commodity, e.g. Oil or Wheat, the contract is termed a “commodity derivative”. When the underlying is an exchange rate, the contract is termed a “currency derivative”. Both future and options contracts are available on commodities and as well as on currencies.

Commodity derivatives

Derivatives have become an integral part of today’s commodity trading and are used for various types of risk protection and in innovative investment strategies. Commodity derivative markets play an increasingly important role in the commodity market value chain by performing key economic functions such as risk management through risk reduction and risk transfer, price discovery and transactional efficiency. Commodity derivatives markets allow market participants such as farmers, traders, processors, etc. to hedge their risk against price volatility through commodity futures and options.

Commodity futures contracts are highly uniform and are well-defined. These contracts explicitly state the commodities (quantity and quality of the goods) that have to be delivered at a certain time and place (acceptable delivery date) in a certain manner (method for closing the contract) and define their permissible price fluctuations (minimum and maximum daily

price changes). Therefore, a commodity futures contract is a standardized contract to buy or sell commodities for a particular price and for delivery on a certain date in the future.

For instance, if a Biscuit manufacturer wants to buy 10 tonnes of wheat today, he can buy the wheat in the spot market for immediate use. If he wants to buy 10 tonnes of wheat for future use, he can buy wheat futures contracts at a commodity futures exchange. The futures contracts provide for the delivery of a physical commodity at the originally contracted price at a specified future date, irrespective of the actual price prevailing on the actual date of delivery.

Futures trading in commodities can be conducted between members of an approved exchange only. Futures trading in commodities is organized by these exchanges after obtaining a certificate of registration from the SEBI. The national exchanges in which commodity derivatives are currently traded in India are: Multi Commodity Exchange of India Limited (MCX), National Commodity & Derivatives Exchange Limited (NCDEX), Indian Commodity Exchange Limited (ICEX), National Stock Exchange of India Limited (NSE) and BSE Limited (Bombay Stock Exchange).

Commodities that are traded on Indian exchanges can be grouped into four major categories: Bullion, Metals, Energy and Agriculture. An indicative list of commodities traded in the Indian derivatives exchanges are:

Bullion: Gold, Silver, Diamond

Metals: Aluminium, Brass, Copper, Lead, Nickel, Steel, Zinc

Energy: Crude Oil, Natural Gas

Agriculture: Barley, Chana, Maize, Wheat, Guar Seed, Guar Gum, Isabgul Seed, Pepper, Cardamom, Coriander, Jeera, Turmeric, Sugar, Copra, Rubber, Jute, Cotton, Cotton Seed Oilcake, Castor Seed Oil, Mentha Oil, Soy Bean, Soy Bean Oil, Refined Soy Oil, Degummed Soy Oil, Rape/Mustard Seed, Crude Palm Oil, RBD Palmolein.

Commodity options in India devolve into Commodity Futures. That means, buyers of commodity options would get a right to have a position in underlying commodity futures rather than getting a right to out-rightly buy/sell the actual commodity on expiry. Therefore, the underlying for a commodity options contract is a commodity futures contract of a specified month traded on the corresponding exchange. This is one example where a derivative has another derivative as underlying. Such an instrument is also called Exotic Option in this case.

Currency derivatives

Unlike any other traded asset class, the most significant part of currency market is the concept of currency pairs. In currency market, while initiating a trade you buy one currency and sell another currency. Every trade in FX market is a currency pair: one currency is bought with or

sold for another currency. In case of currency derivatives, the underlying is an exchange rate. Currency risks could be managed through any of the currency derivatives i.e. forwards, futures, swaps and options. Each of these instruments has its role in managing the currency risk.

A currency future, also known as FX future, is a futures contract to exchange one currency for another at a specified date in the future at a price (exchange rate) that is fixed on the purchase date. Currency Options are contracts that grant the buyer of the option the right, but not the obligation, to buy or sell underlying currency at a specified exchange rate during a specified period of time. For this right, the buyer pays a premium to the seller of the option.

Currency Derivatives are available on four currency pairs viz. US Dollars (USD), Euro (EUR), Great Britain Pound (GBP) and Japanese Yen (JPY). Cross Currency Futures & Options contracts on EUR-USD, GBP-USD and USD-JPY are also available for trading in Currency Derivatives segment.

5.6 Underlying concepts in derivatives

Zero Sum Game

In a futures contract, the counterparties who enter into the contract have opposing views and needs. The seller of gold futures thinks prices will fall, and benefits if the price falls below the price at which she entered into the futures contract. The buyer of gold futures thinks prices will rise, and benefits if the price rises beyond the price at which she has agreed to buy gold in the future. On maturity the market price of the underlying would be same for both the futures contracts, leading to profits to only of them. But when the net positions of the both the buyer and seller are considered, it always amounts to zero. Hence the word Zero Sum Game suits appropriately to describe the net positions of derivative instruments. However there are the two usual assumptions to this conclusion, that there are no taxes and no transaction costs.

Settlement Mechanism

Earlier most derivative contracts were settled in cash. Cash settlement is a settlement method where upon expiration or exercise of the derivatives contract, the counterparties to the contract settle their position through exchange of the price differentials and do not deliver the actual (physical) underlying asset. However, SEBI has mandated physical settlement (settlement by delivery of underlying stock) for all Individual stock derivatives and commodity derivatives. Derivative Contracts on indexes (Nifty, Bank Nifty etc) are still settled in Cash.

Arbitrage

The law of one price states that two goods (assets) that are identical, cannot trade at different prices in two different markets. If not, it will be easy to buy from the cheaper market and sell at the costlier market, and make riskless profits. However, such buying and selling itself will

reduce the gap in prices. The demand in the cheaper market will increase prices there and the supply into the costlier market will reduce prices, bringing the prices in both markets to the same level. Arbitrageurs are specialists who identify such price differential in two markets and indulge in trades that reduce such differences in price. Prices in two markets for the same tradable asset will be different only to the extent of transaction costs. These costs can include transportation, storage, insurance, interest costs and any other cost that impacts the activities of buying and selling.

In the derivative market, the underlying asset is the same as it is in the cash market. But the price to buy the same asset in the derivative market can be different from that of the cash market due to the presence of other costs such as physical warehousing or interest costs. The pricing of derivatives takes into account these costs.

Margining Process

Margin is defined as the funds or securities which must be deposited by Clearing Members as collateral before executing a trade. The provision of collateral is intended to ensure that all financial commitments related to the open positions of a Clearing Member can be offset within specified period of time. There are different kinds of margins. The initial margin is charged to the trading account on the assumption that the position will be carried out till the expiry of the contract. The initial margin has two components; Standard Portfolio Analysis of Risk (SPAN)[23] margins and Extreme Loss Margins (ELM margins) based on exposure. Both margins have to be mandatorily deposited before taking a trade. The initial margin should be large enough to cover the loss in 99 per cent of the cases. The greater the volatility of the stock, greater the risk and, therefore greater is the initial margin. In addition to Initial Margin, a Premium Margin is charged to trading members trading in Option contracts. The premium margin is paid by the buyers of the Options contracts and is equal to the value of the options premium multiplied by the quantity of Options purchased.

Open Interest

Open interest is commonly associated with the futures and options markets. Open interest is the total number of outstanding derivative contracts that have not been settled. The open interest number only changes when a new buyer and seller enter the market, creating a new contract, or when a buyer and seller meet—thereby closing both positions. Open interest is a measure of market activity. However, it is to be noted that it is not trading volume. Open interest is a measure of the flow of money into a futures or options market. Increasing open interest represents new or additional money coming into the market while decreasing open interest indicates money flowing out of the market.

[23] The margin calculation is carried out using a software called - SPAN® (Standard Portfolio Analysis of Risk). It is a product developed by Chicago Mercantile Exchange (CME) and is extensively used by leading stock exchanges of the world.

5.7 Investment in Derivatives in Portfolio Managers

Portfolio managers are permitted to invest in derivatives, including transactions for the purpose of hedging and portfolio rebalancing, through recognised stock exchanges. Portfolio managers can invest in derivatives on the terms specified in the Portfolio Management Agreement. The Agreement should contain complete details pertaining to the manner and terms of usage in derivatives product including quantum of exposure to derivatives (in absolute terms and as a percentage of investment in other securities in the portfolio), type of derivative instruments, purpose of using derivatives, type of derivative position and the exposure thereof, terming of valuing and liquidating derivative contracts in the event of liquidation of portfolio management scheme, prior permission from the investors in the event of any changes in the manner or terms of usage of derivative contracts etc.

The total exposure of the portfolio client in derivatives should not exceed his portfolio funds placed with the Portfolio Manager and Portfolio Manager should, in essence, invest and borrow on behalf of his clients. Investment in derivatives is only on the terms mutually agreed between the Portfolio Managers and the client through Portfolio Management agreement. In the event of any violation of the terms of the agreement, the portfolio manager shall be responsible. Portfolio Managers are required to provide necessary disclosures in the Disclosure Document in terms of the PM Regulations.

Portfolio Managers are permitted to participate in Exchange Traded Commodity Derivatives on behalf of their clients subject to the regulatory stipulations.

Chapter 5: Sample Questions

1. In a Nifty 50 futures contract ,the underlying is _____.
a. the top traded stocks of the Nifty 50 index
b. the average price of the stocks of the Nifty 50 index
c. the value of the Nifty 50 index
d. all of the above

2. The counterparty risk in a futures contract is mitigated primarily through _____.
a. collateralisation by one of the parties to the contract
b. settlement on gross basis between two parties
c. the functions of the clearing corporation
d. the limits on positions and trading volumes

3. The settlement price for determining daily mark-to-market margins for a futures contract is _____.
a. the last traded price
b. the average of the high, low and closing prices
c. the weighted average price of last 30 minutes of trading
d. the average of the last 60 minutes of trading

4. Arbitrage opportunities can exist between _____.
a. Spot and futures prices
b. Two futures prices
c. Futures and options prices
d. All of the above

CHAPTER 6: MUTUAL FUND

LEARNING OBJECTIVES:

After reading this chapter, the reader should understand about:

- Concept and Role of Mutual Fund
- Benefits of investing through mutual funds
- Legal Structure of Mutual Fund in India
- Working of mutual funds
- Types of Mutual fund products
- Reading mutual fund information through factsheet

6.1 Concept and Role of Mutual Fund

Mutual fund is a vehicle (in the form of a "trust") to mobilize money from investors, to invest in different markets and securities, in line with stated investment objectives. In other words, through investment in a mutual fund, an investor can get access to equities, bonds, money market instruments and/or other securities and avail of the professional fund management services offered by an asset management company. When someone says that one has invested in a mutual fund scheme, often, the scheme is perceived to be competing with the traditional instruments of investment, viz. equity shares, debentures, bonds, etc. Rather, the reality is that a mutual fund scheme is not competing, but channelizing investor's money into the traditional instruments.

Mutual funds offer different kinds of schemes to cater to the need of diverse investors. Various investors have different investment preferences and needs. In order to accommodate these preferences, mutual funds mobilize different pools of money. Each such pool of money is called a mutual fund scheme. Every scheme has a pre-announced investment objective. In line with the objectives that the scheme would decide the investment universe i.e. the types of securities to invest in. Investors choose a mutual fund scheme whose investment objectives reflects their own needs and preference.

The money mobilized from investors is invested by the mutual fund scheme in a portfolio of securities as per the stated investment objective. Profits or losses, as the case might be, belong to the investors or unitholders. No other entity involved in the mutual fund in any capacity participates in the scheme's profits or losses. They are all paid a fee or commission for the contributions they make to launch and operate the schemes.

6.2 Benefits of investing through mutual funds

Mutual fund investment simplifies the process of investing and holding securities. Mutual funds offer investors the opportunity to earn an income or build their wealth through professional management of their investible funds. There are several aspects to such professional management viz. investing in line with the investment objective, investing based on adequate research, and ensuring that prudent investment processes are followed. Mutual fund benefits are not restricted to research and selection of securities to construct a portfolio of investments, but also to take care of various administrative tasks like collection of corporate benefits (for example: interest payments, dividends, rights issues, buybacks, etc.), or follow up on the same. The calculation and publishing of Net Assets Value (NAV) on a daily basis means that the accounting of the entire portfolio is done on a daily basis. The investor managing one's portfolio independently needs to take all this efforts. All these benefits come at a very low cost and are available even for the smallest investments through mutual fund investments. Some of these benefits are elaborated below:

Affordable Portfolio Diversification

Investing in the units of a scheme provide investors the exposure to a range of securities held in the investment portfolio of the scheme in proportion to their holding in the scheme. Thus, an investor can get proportionate ownership in a diversified investment portfolio even for a small investment of Rs. 500 in a mutual fund scheme.

With diversification, an investor ensures that "all the eggs are not in the same basket". Consequently, the investor is less likely to lose money on all the investments at the same time. Thus, diversification helps reduce the risk in investment. This kind of diversification is neither economically viable nor achievable by an individual investor. Instead, they can achieve the diversification through an investment of less than thousand rupees in a mutual fund scheme.

Economies of Scale

Pooling of large sums of money from many investors makes it possible for the mutual fund to engage professional managers for managing investments. Individual investors with small amounts to invest cannot, by themselves, afford to engage such professional management.

Large investment corpus leads to various other economies of scale. For instance, costs related to investment research and office space gets spread across investors. Further, the higher transaction volume makes it possible to negotiate better terms with brokers, bankers and other service providers.

Transparency

An investor is well served if relevant information is available on time. Availability of such information is critical for taking informed investment decision. The structure of mutual funds and the regulations by SEBI have ensured that investors get such transparency about their investments. There are three essential places from where the investor can get enough

information for taking informed decisions, viz., scheme related documents (Scheme Information Document (SID)[24], Statement of Additional Information (SAI), and Key Information Memorandum (KIM), portfolio disclosures, and the Net Assets Value(NAV) of the scheme. Incidentally, even a prospective investor can access all this information.

Tax benefits

Specific schemes of mutual funds like Equity Linked Savings Schemes (ELSS) give investors the benefit of deduction of the amount subscribed (upto Rs. 150,000 in a financial year), from their income that is liable to tax. This reduces their taxable income, and therefore the tax liability.

Convenient Options

The options offered under a scheme allow investors to structure their investments in line with their liquidity preference and tax position. There are also transaction conveniences like the ability to withdraw only part of the money from the investment account, ability to invest additional amount to the account, etc.

Regulatory Comfort

The regulator, Securities and Exchange Board of India (SEBI), has mandated strict checks and balances in the structure of mutual funds and their activities. Mutual fund investors benefit from such protection.

6.3 Legal Structure of Mutual Fund in India

SEBI (Mutual Fund) Regulations, 1996 define "mutual fund" as "a fund established in the form of a trust to raise monies through the sale of units to the public or a section of the public under one or more schemes for investing in securities, money market instruments, gold or gold-related instruments, silver or silver related instruments, real estate assets and such other assets and instruments as specified by SEBI from time to time." The firm must set up a separate Asset Management Company (AMC) to run mutual fund business.

Key features of a mutual fund that flow from the above definition are:

- It is established as a trust
- It raises money through sale of units to the public or a section of the public
- The units are sold under one or more schemes

[24] Candidates are advised to read: https://www.sebi.gov.in/legal/circulars/dec-2024/upload-of-draft-scheme-information-documents_90097.html

- The schemes invest in securities (including money market instruments) or gold or gold-related instruments or real estate assets.

SEBI has stipulated the legal structure under which mutual funds in India need to be constituted. The structure, which has inherent checks and balances to protect the interests of the investors, can be briefly described as follows:

- Mutual funds are constituted as Trusts. Therefore, they are governed by the Indian Trusts Act, 1882
- The mutual fund trust is created by one or more Sponsors, who are the main persons behind the mutual fund business.
- Every trust has beneficiaries. The beneficiaries, in the case of a mutual fund trust, are the investors who invest in various schemes of the mutual fund.
- The operations of the mutual fund trust are governed by a Trust Deed, which is executed between the sponsors and the trustees. SEBI has laid down various clauses that need to be part of the Trust Deed.
- The Trust acts through its trustees. Therefore, the role of protecting the interests of the beneficiaries (investors) is that of the Trustees. The first trustees are named in the Trust Deed, which also prescribes the procedure for change in Trustees.
- To perform the trusteeship role, either individuals may be appointed as trustees or a Trustee company may be appointed. When individuals are appointed as trustees, they are jointly referred to as 'Board of Trustees'. A trustee company functions through its Board of Directors.
- Day to day management of the schemes is handled by an Asset Management Company (AMC). The AMC is appointed by the sponsor or the Trustees.
- The trustees execute an investment management agreement with the AMC, setting out its responsibilities.
- Although the AMC manages the schemes, custody of the assets of the scheme (securities, gold, gold-related instruments & real estate assets) is with a Custodian, who is appointed by the Trustees.
- Investors invest in various schemes of the mutual fund. The record of investors and their unit-holding may be maintained by the AMC itself, or it can appoint a Registrar & Transfer Agent (RTA)

6.4 Working of mutual funds

Day to day operations of mutual fund are handled by the AMC. The sponsor or, the trustees if so authorized by the trust deed, shall appoint the AMC with the approval of SEBI.

Chart 6.1: Organisation Structure of Asset Management Company

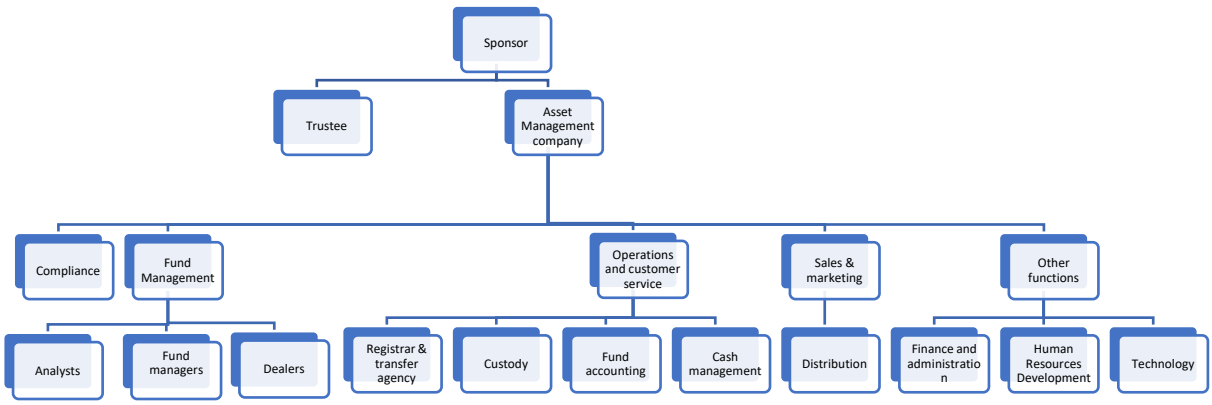


Chart 6.1 is used for explanation of various functions within an AMC. Individual AMCs may have some differences in the structure.

Compliance Function

Compliance Officer needs to ensure all the legal compliances. In the scheme documents of new issues, the Compliance Officer signs a due-diligence certificate to the effect that all regulations have been complied with, and that all the intermediaries mentioned in the scheme related documents have the requisite statutory registrations and approvals. To ensure independence, the Compliance Officer reports directly to the head of the AMC. The Compliance Officer works closely with the Trustees on various compliance and regulatory issues. It is the responsibility of the compliance officer to report any issue of non-compliance directly and immediately to the trustees.

Fund management

Fund management is the most critical function in an Asset Management Company. It is at the core of the value proposition offered by the firm. The main function of this team is to invest the investors' money in line with the stated objective of the scheme, and to manage the same effectively.

Normally, the team can be broken into three sub-teams, viz., the analysts, the fund managers, and the dealers.

The analysts analyse various opportunities, be it individual securities, or sectors, or the state of the markets, or the economy. Some of them may analyse the stock markets, whereas some may analyse debt markets. Within debt markets, some may evaluate credit opportunities, whereas some may analyse the interest rate movements. Their job is to identify investment opportunities.

The fund managers evaluate the opportunities presented to them by the analysts, the brokers, and other research firms. They may also identify opportunities by themselves. Performance of the scheme is the fund manager's responsibility.

The third sub-team is that of the dealers, whose responsibility is to place orders with securities brokers based on the instructions of the fund managers.

Operations and customer services team

When a customer visits a branch office of an AMC, s/he is attended to by the customer services team. Such a team is also called the front office team. Apart from this front office team, there is also a team in the back office to help investors by resolving various queries. Both these together are part of the Customer Services Team. Many AMCs have adopted information technology solutions and have set up call centres and chat bots to answer customer queries and to resolve service issues.

The Registrar and Transfer Agency (RTA), which is a big part of this unit, maintains investor records as well as allots or redeems units, processes purchase/redemption/switch requests, dividends, etc.. It also generates the account statement that an investor receives.

There is a Custody Team within this group that interacts with the custodian for the purpose of settlement of various transactions that the fund management team initiates.

Fund accounting team maintains books of accounts of each individual mutual fund scheme and calculates NAV on a daily basis.

Cash management team works as an interface between the banks and the fund management team–they ensure that money received in the bank when investors purchase units are passed on to the fund managers for further investment in securities and the investors get the redemption proceeds when they submit the redemption request.

Sales and Marketing Team

This team reaches out to the investors through mass media, marketing campaigns and through distribution channel. Their major responsibilities include branding, advertising, management of various events, and distribution of mutual fund products through various distribution channels. Mostly, it is this team that would interact with the mutual fund

distributors, and take care of relationship management and engagement. This team also helps in the growth of the distribution network through various interactions and training programs.

Other functions

These functions are largely support functions to run the AMC operations smoothly. These include Finance/Accounts, Administration, Human Resources (HR) and Development, Information Technology. They perform various tasks that ensure smooth functioning of the AMC, as well as improve customer experiences.

- The Accounts team handles the finances of the AMC. This unit is different from the fund accounting team.
- There is an Administration Department that takes care of various facilities, offices, and other infrastructure. In many AMCs, the administration reports to the finance function.
- The HR department is responsible for attracting, nurturing and retaining talent within the firm. They take care of learning and development requirements of the personnel.
- The Information Technology department, also referred as the Technology team, takes care of the IT infrastructure required by various functions and departments. This may also include the AMC website, as well as many facilities offered to investors and distributors with the help of technology.

6.5 Types of Mutual fund products

Mutual funds can be classified into multiple ways. Funds can be classified based on the investment objective like growth funds, income funds, and liquid funds. The names of the categories suggest the investment objectives of the schemes. The other ways in which the mutual funds can be classified have been discussed below.

By the structure of the fund – open ended and close ended schemes and interval schemes

Mutual fund schemes are structured differently. Some schemes are open for purchase and repurchase on a perpetual basis. Once the scheme is launched, the scheme remains open for transactions, and hence the name of this category of schemes is open-ended funds. On the other hand, some schemes have a fixed maturity date. This means that these schemes are structured to operate for a fixed period till the maturity date and cease to exist thereafter. Since the closure of the scheme is pre-decided, such schemes are known as close-ended schemes.

Open-ended funds allow the investors to enter or exit at any time, after the New Fund Offer(NFO). Investors can buy additional units in the scheme any time after the scheme opens for on-going transactions. Prospective investors can also buy units. At any time, the existing investors can redeem their investments, that is, they can sell the units back to the scheme to get their money back.

Close-ended funds have a fixed maturity. Investors can buy units of a close-ended scheme, from the fund, only during its NFO. The investors cannot transact with the fund after the NFO is over. At the end of the maturity period, the scheme is wound up, units are cancelled and the money is returned to the investors. The fund makes arrangements for providing liquidity, post-NFO through listing of the units on a stock exchange. Such listing is compulsory for close-ended schemes to provide liquidity to the investors.

Interval funds combine features of both open-ended and close-ended schemes. They are largely close-ended but become open-ended at pre-specified intervals. For instance, an interval scheme might become open-ended between January 1 to 15, and July 1 to 15, each year. The benefit for investors is that, unlike in a purely close-ended scheme, they are not completely dependent on the stock exchange to be able to buy or sell units of the interval fund. However, to provide liquidity to the investors between these intervals, the units must be compulsorily listed on stock exchanges to allow investors an exit route. The periods when an interval scheme becomes open-ended, are called 'transaction periods'; the period between the close of a transaction period, and the opening of the next transaction period is called 'interval period'. Minimum duration of transaction period is 2 days, and maximum duration of interval period is 15 days. No redemption/repurchase of units is allowed except during the specified transaction period (during which both subscription and redemption may be made to and from the scheme).

By the management of the portfolio – active funds and passive funds

Actively managed funds are funds where the fund manager has the flexibility to choose the investment portfolio, within the broad parameters of the investment objective of the scheme. Since this increases the role of the fund manager, the expenses for running the fund turn out to be higher. Investors expect actively managed funds to perform better than the market.

Passive funds invest on the basis of a specified index; whose performance it seeks to track. Thus, a passive fund tracking the Standard & Poor's Bombay Stock Exchange Sensex (S&P BSE Sensex) would buy only the shares that are part of the composition of the S&P BSE Sensex. The proportion of each share in the scheme's portfolio would also be the same as the weightage assigned to the share in the S&P BSE Sensex. Thus, the performance of these funds tends to mirror the concerned index. They are not designed to perform better than the market. Such schemes are also called index schemes. Since the portfolio is determined by the index itself, the fund manager has no role in deciding on investments. Therefore, these schemes have low running costs.

By the investment universe: equity funds, fixed income funds, money market funds, gold funds, international funds

This type of classification looks at the investment universe where the scheme may invest money. There are equity funds, fixed income funds, money market funds, gold funds,

international funds, etc. Here, the category names indicate where the money could be invested.

This classification may get further specific depending on narrowing the investment universe. For example, within equity funds, we have large-cap funds, mid-cap funds, etc. Similarly, within debt funds, we have Government Securities funds, and corporate debt funds.

Specialized Investment Fund

SEBI in its recent amendment to SEBI (Mutual Funds) Regulations, has introduced a new product line under mutual funds known as Specialized Investment Fund (SIF). The minimum required investment amount is Rs. 10 lakhs from the investors across all investment strategies.[25] This is created essentially in the segment between Mutual Fund and Portfolio Management Services, to provide more flexibility in the investment style.

6.6 Processes of investing in mutual funds

SEBI regulations prescribe the categories of investors who are eligible to invest in mutual fund in India. This includes resident individuals, Non Resident Indians (NRIs), Persons of Indian Origin (PIOs), Foreign nationals, Institutions and Trusts. Eligible investors in a mutual fund have to undergo a 'Know Your Customer' (KYC) procedure prescribed by SEBI to be able to invest in mutual funds. All investors in mutual funds must have a Permanent Account Number or PAN. The PAN is mandatory information that has to be provided at the time of applying for units. The only exception where PAN need not be provided is where investments made by an individual investor, either as lump sum or systematic investment plans, do not exceed Rs. 50,000 per annum per mutual fund.

Purchasing units of a mutual fund

Units of a mutual fund are first available for investing when the scheme is launched in a New Fund Offer (NFO). The NFO will be open for a period of 15 days during which the investor has to make the application. Payment for the units can be made only through approved payment modes that are mentioned in the offer document. These include cheque and online payment facilities like internet banking (National Electronic Fund Transfer (NEFT) and Real Time Gross Settlements(RTGS), Application Supported by Blocked Amount (ASBA) etc. Investors can invest in open-ended funds after the NFO period also. Sale of units on an ongoing basis by an open-ended fund is called continuous offer. The price of units in the continuous offer depends on the NAV of the fund, and is declared for every business day.

[25] Vide SEBI (Mutual Funds) (Third Amendment) Regulations, 2024 w.e.f. December 16, 2024 https://www.sebi.gov.in/legal/regulations/dec-2024/securities-and-exchange-board-of-india-mutual-funds-regulations-1996-last-amended-on-december-16-2024-_90131.html

Units of close ended mutual funds are mandatorily listed on the stock exchange. Both purchase and redemption of both close ended and open ended schemes can be done using this channel. The units need to be held in dematerialised form to be able to conduct transactions through this channel.

Redemptions of units

Redemption refers to encashing or withdrawing the investment made in a mutual fund by selling the units back to the mutual fund. Investments made in an open-ended fund can be redeemed at any time at the current applicable NAV. Units of a closed-ended fund can be redeemed with the mutual fund only when the fund matures. Alternatively, they can be sold at stock exchange where they are listed.

6.6.1. Systematic transaction

Transactions with mutual funds can be automated by signing on for the facility of systematic transactions offered by mutual funds. This can be for purchases (Systematic Investment Plan), redemptions (Systematic Withdrawal Plan) or transfers from one scheme to another (Systematic Transfer Plan). Investors specify the details of the periodic transactions to be done at the time of initiating the facility. The mutual fund will periodically execute the systematic transactions as directed. The details that have to be specified are:

- Type of transaction: Purchases, redemptions, transfers.
- Period: Length of time for which the transactions will run, say one year.
- Periodicity of transactions: The frequency of transactions, say monthly, quarterly, half yearly.
- Day of transaction: the day of the month on which each transaction will be executed, say 15^{th} of the month.
- Amount: For each transaction and the total amount intended to be invested over a defined period.

6.7 Legal and Regulatory Framework – Key SEBI Regulation

A mutual fund is authorised by regulations to pool funds from investors and invest the funds on their behalf. The Securities and Exchange Board of India (SEBI) is the primary regulator of mutual funds in India. Only entities registered with SEBI under the SEBI (Mutual Fund) Regulations, 1996 can conduct the business of a mutual fund. The regulatory provisions are designed to protect the interests of the investors who invest in a fund.

The following are the key features of Mutual Fund Regulation**:**

1. A mutual fund is created as trust. The investors' funds and investments are held in this trust. The trust has trustees who are responsible for ensuring that the fund's managers manage the funds in the investors' interest and according to the stated objectives and

regulations. Investor's money is held independently and not in the AMC's balance sheet.

2. The track record and capital that the promoters of AMCs should have and the role and responsibilities of the trustees and AMC have been defined in the regulations.
3. Mutual fund schemes cannot be offered to the public before the approval of the trustees and SEBI. The format and details of disclosures to be provided in the offer documents is defined in the regulations.
4. The investment portfolio has to adhere to the scheme objectives and be well diversified. The regulations specify limits on investments that the fund manager can make in a portfolio so that the risk to the investor is managed. The valuation of securities held in a portfolio and accounting for income and expenses are defined by SEBI regulations. This ensures that investors get a correct representation of the value of their investments.
5. The types of expenses that a mutual fund can charge to a scheme and the limits on these expenses are subject to SEBI regulations. This is to ensure that investors do not pay an unreasonably high fee for the services of the fund managers.
6. SEBI regulation prescribes periodic reporting of the fund's performance and investment details to the investors. The content and format of reporting information is specified by SEBI. For example, an equity fund has to publish its returns along with the return of the benchmark indices with which the AMC and trustees would compare the performance of the scheme so that investors are able to assess how the fund has performed relative to the markets in which the fund has invested.
7. The AMC has to make periodic reports and disclosures to SEBI, trustees and the Board of Directors of the AMC.

6.8 Fact Sheet - Scheme Related Information

One of the most popular document from the mutual fund is the monthly Fund Factsheet. This document is extensively used by investors, fund distributors, fund rating agencies, research analysts, media and others to access information about the various schemes of the mutual fund. While it is not a regulatory requirement to publish the monthly fact sheet, it is a market practice followed by all the fund houses, on a voluntary basis. Since fund factsheet is a marketing and information document, various SEBI regulations pertaining to information disclosure are applicable to it.

6.8.1. Reading mutual fund information

The fund factsheet contains the basic information of each scheme such as the inception date, corpus size (Assets Under Management(AUM)), current NAV, benchmark and a pictorial depiction of the fund's style of managing the fund. The fund's performance relative to the benchmark is provided for the different periods along with the benchmark returns, as

required by SEBI's regulations. The factsheet also provides the SIP returns in the scheme, portfolio allocation to different sectors and securities. However, some fund houses do not disclose the entire portfolio but only the top 10 holdings.

In the factsheet, security wise as well as sector wise allocation is provided for equity schemes. Some factsheets also disclose the derivatives exposure taken by the mutual fund schemes. In the debt funds, the factsheet discloses the rating profile of the various securities, and a snapshot of exposure of the scheme to various rating baskets.

Portfolio features such as the Price-Earnings ratio (PE Ratio), Beta and risk measures such as standard deviation and Sharpe ratio (in case of equity funds), credit rating profile, average maturity and duration (in case of debt funds) are also available in the factsheet. The factsheet also provides investment details such as the minimum investment amount, the plans and options available in the scheme, the loads and expenses and systematic transaction facilities available in the fund.

6.9 Net Asset Value, Total Expense Ratio, Pricing of Units

Net Asset Value : Mutual fund pools the money contributed by investors to a scheme and invests them in a portfolio of securities. The investments made by the fund belong to the investors, who will share the profits or losses made and the costs incurred in proportion to their investment.

An investor's investment in a mutual fund is represented by the number of units holding and a mutual fund investor is called a unit holder. The money contributed by investors in a mutual fund is invested in a portfolio of securities. The value of these securities will fluctuate and lead to an increase or decrease in the value of the portfolio. A mutual fund has to calculate and declare to its investors the current market value of each unit every day by taking the current market price of the securities held in the portfolio.

The NAV is the current value of a mutual fund unit. This will depend upon the current mark to market (MTM) value of the securities held in the portfolio of the fund and any income earned such as dividend and interest. From this value, the costs and expenses charged for managing the fund are deducted. The value remaining is called the net assets of the fund. The net assets divided by the number of outstanding units give the NAV of the fund.

Pricing of Units: In case of open-ended funds, transactions are priced using the NAV to ensure parity among investors that buy new units, investors that stay in the fund, and investors that move out of a fund. Whereas close ended units are listed at the stock exchange, and price of those units is determined by the demand and supply of the units, which of course is influenced by the NAV of the units.

Total Expense Ratio: All types of expenses incurred by the Asset Management Company have to be clearly identified and appropriated for all mutual fund schemes. The most important expense is the **Investment and Advisory Fees** charged to the scheme by the AMC.

6.10 Mutual Fund Scheme Performance

The portfolio is the main driver of performance for mutual fund scheme. The asset class in which the fund invests, the segment or sectors of the market in which the fund will focus on, the styles adopted to select securities for the portfolio and the strategies adopted to manage the portfolio determines the risk and return in a mutual fund scheme. The underlying factors are different for each asset class. In case of equity based portfolios, market risk, sector specific risk and company risk drive the performance. In case of debt portfolios, interest rate risk and credit risk are the driving factors. Investors need to remember that return performance of a fund is driven by underlying risk factors.

6.11 Key performance measures

As per the Advertisement Guidelines for Mutual Funds by SEBI, the performance of the mutual fund schemes need to be disclosed as follows:

- When the mutual fund scheme has been in existence for more than three years:
  - Performance advertisement of mutual fund schemes shall be provided in terms of CAGR for the past 1 year, 3 years, 5 years and since inception along with their respective benchmark.
  - Point-to-point returns on a standard investment of Rs. 10,000 shall also be shown in addition to CAGR for the scheme to provide ease of understanding to retail investors.
- In the case of money market schemes or cash and liquid schemes, wherein investors have very short investment horizon, the performance can be advertised by simple annualization of yields if a performance figure is available for at least 7 days, 15 days and 30 days. Further, it should not give an unrealistic or misleading picture about the performance or future performance of the scheme.

  For measuring the risk, variance, standard deviation, beta and tracking errors are calculated. In addition to these measures, in the factsheets of the mutual funds, the following performance measures are disclosed:
  - Sharpe Ratio
  - Treynor Ratio
  - Information Ratio
  - Alpha
  - Tracking error (in case of Index funds)

  All these measures are discussed in detail in Chapter 10.

Chapter 6: Sample Questions

1. A _____ is a trust that pools the savings of a number of investors who share a common financial goal.

    a. Custodian
    b. Depository
    c. Bank
    d. Mutual Fund

2. The following is/are the benefits of investing through mutual funds:

    a. Professional investment Management
    b. Risk reduction through diversification
    c. Convenience of making transactions and record keeping
    d. All the above

3. The types of securities purchased by the fund, depends on _____.

    a. the investment objectives of the fund
    b. decisions of SEBI about the fund
    c. decisions of RBI about the fund
    d. Decisions of the fund advisors

4. The following schemes have the features of:

    - Continuous sale and purchase of units at NAV or NAV related prices,
    - Investor can enter and exit the scheme any time during the life of a fund
    - The scheme does not have specific time frame

    a. Open ended scheme
    b. Close ended scheme
    c. Interval scheme
    d. All the above

5. The SEBI (Mutual Funds) Regulations came in the year:

    a. 1996
    b. 1998
    c. 2000
    d. 1964

CHAPTER 7: ROLE OF PORTFOLIO MANAGERS

LEARNING OBJECTIVES:

After reading this chapter, the reader should understand about:

- Different kinds of portfolio management services
- Organisation Structure of PMS in India
- Registration requirements of a Portfolio Manager
- Responsibilities of a Portfolio Manager
- Administration of the portfolio
- Dos and don'ts for the portfolio managers

7.1 Overview of portfolio managers in India

Risk and return are the two important aspects of financial investment. Portfolio management involves selecting and managing a basket of assets that minimizes risk, while maximizing return on investments. A portfolio manager plays a pivotal role in designing customized investment solutions for the clients.

A portfolio manager is a body corporate which, pursuant to a contract or arrangement with a client, advises or directs or undertakes on behalf of the client (whether as a discretionary portfolio manager or otherwise), the management or administration of a portfolio of securities or the client's funds. Portfolio managers are registered and regulated under SEBI (Portfolio Managers) Regulations, 2020. According to SEBI guidelines, portfolio management services (PMS) can be offered only by SEBI registered entities.

January 1993, marked the beginning of Portfolio Management Service when SEBI issued Securities and Exchange Board of India (Portfolio Managers) Regulations, 1993. These were one of the first few regulations issued by the regulators. These regulations came even before the mutual fund regulations. This shows the importance of the sector to the regulator.

In India, the major providers of portfolio management services are big brokerage firms, asset management companies and independent experts.

7.2 Types of portfolio management services

On the basis of provider of the services PMS can be classified as:

1. PMS by asset management companies
2. PMS by brokerage houses

3. Boutique (independent) PMS houses

They can further be classified on the basis of product class as:

1. Equity based PMS
2. Fixed Income based PMS
3. Commodity PMS
4. Mutual Fund PMS
5. Multi Asset based PMS

Portfolio managers may classify their clients on the basis of their net-worth.

Another way which also finds mention in the regulation also is on the basis of the services provided by the portfolio managers. The following are the types of portfolio management services:

7.2.1 Discretionary Services

As per SEBI's Portfolio Managers Regulations, 2020 "discretionary portfolio manager" means a portfolio manager who under a contract relating to portfolio management, exercises or may exercise, any degree of discretion as to the investment of funds or management of the portfolio of securities of the client, as the case may be.

In other words, discretionary portfolio manager individually and independently manages the funds of each investor as per the contract. This could be based on an existing investment approach or strategy which the portfolio manager is offering or can be customized based on client's requirement.

7.2.2 Non-Discretionary Services

Non-discretionary portfolio manager manages the funds in accordance with the directions of the client. The portfolio manager does not exercise his/her discretion for the buy or sell decisions. The portfolio manager has to consult the client for every transaction. Decisions such as 'What to buy/sell?' and 'When to buy/sell?' vests with the investor. The execution of trade is done by the portfolio manager. So in this case, the Portfolio Manager provides investment execution services but not investment management services.

7.2.3 Advisory Services

In advisory role, the portfolio manager suggests the investment ideas or provides non-binding investment advice. The investor take the decisions. The investors also executes the transactions. These kind of services are typically used for institutional clients, who manages portfolio's on their own, but typically hires country experts in each country.

7.3 Organizational structure of PMS in India

A portfolio manager is a body corporate who, pursuant to a contract or arrangement with a client, advises or directs or undertakes on behalf of the client (whether as a discretionary portfolio manager or otherwise), the management or administration of a portfolio of securities or the funds of the client.

Body corporate broadly means a corporate entity which has a legal existence.

The Companies Act has provided an extensive definition of the term body corporate. The term "body corporate" is defined in Section 2(11) of the Companies Act, 2013.
“Body corporate” or “Corporation” includes a company incorporated outside India, but does not include—
(i) a co-operative society registered under any law relating to co-operative societies; and
(ii) any other body corporate (not being a company as defined in this Act), which the Central Government may, by notification, specify in this behalf;

In simple terms, the term body corporate includes a private company, public company, one persona company, small company, Limited Liability Partnerships, foreign company etc.

A body corporate means any entity that has its separate legal existence apart from the persons forming it. It enjoys a completely different legal status apart from its members.

7.4 Registration requirements of a Portfolio Manager

To act as a portfolio manager, obtaining certificate of registration from SEBI under the Portfolio Managers Regulations is a mandatory requirement. All entities desirous to be registered as a portfolio manager are required to file an online application on SEBI Intermediary Portal.

The application for obtaining the certificate needs to be made to SEBI along with non-refundable fee.

The application needs to be made in *Form A* of Schedule I.[26]

Form A is a very detailed form. It requires mainly the following information.

No.	Part	Details required to be given
1	Particulars of the applicants	Name of the Applicant: PAN Address of Registered office Address for Correspondence. Address - Principal place of business (Where PMS activity shall be carried out)

[26] Candidates are advised to refer to the latest application form available on SEBI website.

No.	Part	Details required to be given
		If PMS activity is proposed to be carried out from any branch offices, details of such Branch Offices, including address, name of contact person, mobile number of contact person, email of contact person etc.
2	Organization Structure	The objectives of the entity seeking registration, (Memorandum and Articles of Association/ Partnership Deed to be enclosed). (Copy of Board Resolution to be enclosed) **Date and Place of Incorporation:** (date/month/year/place/ROC Registration No.) **Status of the Applicant**: (e.g. Limited Company-Private/Public, LLP etc. If listed, names of the recognized stock exchanges to be given.) **Organization Chart:** [separately showing functional responsibilities (names and designations) of portfolio management activities to be enclosed] **Particulars of all Directors/ Partners** Name; Address; Qualification; Date of Appointment; DIN; PAN (Copy of PAN Card); Telephone No.; Mobile; Email; Experience (Entity name, designation, area of work, nature of work, experience (in years); other directorship/partnerships (entity name, date of appointment, no. of shares, percentage of shareholding) **Key Management Personnel** [Name; Address; Qualification; Date of Appointment; DIN; PAN (Copy of PAN Card); Telephone No.; Mobile; Email; experience (Entity name, designation, area of work, nature of work, experience (in years); other directorship details (name of entity, date of appointment, no. of shares, percentage of shareholding) **Particulars of Promoters** (Type (Individual/Corporate); Name, PAN, Address, Telephone, Mobile, Email) **Particulars of Compliance Officer** (Name, PAN (Copy of PAN card), Address, Qualification, Date of appointment, Address, Experience (company name, designation, area of work, nature of work, experience (in years). **Particulars of Principal Officer** [Name; Qualification; Date of Appointment; PAN (Copy of PAN Card); Certification details (date of test, result, percentage, certificate no., validity from (date) and validity till date)

No.	Part	Details required to be given
		Number of employees and number of employees for Portfolio Management services **Name and activities of associate companies/ entities** **Details of registration with SEBI or any other Govt. Regulatory body (Name of the regulator, Registration No., Registration start/end date, Registration status, details of action taken in the past (if any).List of major shareholders/ partners of the Applicant** (holding 5% or more voting rights)
3	Infrastructural Facilities	Principal Place of Business and for branch office • Office Space • Office Equipment • Furniture and Fixtures • Communication Facilities • Data Processing Capacity: in-house and others • Computer facility : hardware and software • Details of Disaster Recovery Set up / Business Continuity Plan
4	Business Plan (for three years)	**History, Major events and present activities** **Proposed business plan and means of achieving the same.** Projected Profitability (Next three years) (Targets, *modus operandi* to achieve targets, Resultant Income)
5	Financial Information	**Capital Structure** : Paid-up capital & Free Reserves (excluding revaluation reserves) for Year prior to the preceding year of current year, Preceding year, Current Year **Net worth of Applicant** (Net worth certificate not older than 3 months from the date of application to be enclosed) **Deployment of Resources** in Fixed assets, plant machinery and office equipment, investments etc., for Year prior to the preceding year of current year, Preceding year, Current Year **Major Sources of Income** for Year prior to the preceding year of current year, Preceding year, Current Year **Net Profit** for Year prior to the preceding year of current year, Preceding year, Current Year **Particulars of Principal Banks** **Particulars of Auditors**
6	Other Information	**Details of all settled and pending disputes** of previous 3 years **Indictment of involvement in any economic offences** in the last three years.

No.	Part	Details required to be given
		Any other information considered relevant to the nature of services rendered by the company. **Details of Membership with the recognized Stock Exchanges**
7	Business Information	Indicate **type of activity** carried on/ proposed to be carried on. Indicate the **facilities for making decision on portfolio investment**. Details of **risk profiling procedure** to be followed by the Portfolio Manager. Details of **grievance redressal and dispute resolution mechanism** to be followed by the Portfolio Manager. Provide **list of approved share brokers** through whom orders shall be placed, involved for Portfolio Management activities and state whether any of them were suspended/had defaulted with any Stock Exchange authority. Describe **Accounting system** followed/to be followed for Portfolio Management Services. Indicate various **research and database facilities** provided. Details of **activities proposed to be outsourced**.
8	Experience	Experience in financial services rendered: details of activity etc.,
9	Additional Information	Copy of **Draft Agreement** with Client to be provided Copy of Draft Disclosure Document to be provided **Details of Custodian:** (Name, Address, SEBI Registration No., Date of Appointment) **Details of Registration** with other Regulatory bodies.
10	Declaration	a) Declaration of **compliance** with **Regulation 7 (2)** signed by at least Two Directors or designated partners. b) Declaration for **Fit and Proper Person** as specified in SEBI (Intermediaries) Regulations, 2008. c) Declaration of Compliance with **clause 12 (b)** of Schedule III of the Regulations. d) Declaration of Compliance with SEBI circular on **fees and charges**. e) Declaration of **type and frequency of reports sent**/ proposed to be sent to clients. f) Declaration of **time taken for transfer of securities into client accounts**. g) Declaration of **submission of periodic reports and Disclosure Document to SEBI**. h) Declaration of compliance with clause (e) of sub-regulation (1) of Regulation 27 regarding maintenance of records for Investment rationale.

No.	Part	Details required to be given
		Declaration of availability of Disclosure document on website of Portfolio Manager

In addition to the information required to be furnished as discussed above, the regulator may require the applicant to furnish further information or clarification regarding matters relevant to his activity of a portfolio manager. The applicant or its principal officer if required, need to appear before the regulator for personal representation.

Before issuing a certificate of registration, the regulator will ensure **whether**:

1. the applicant is a body corporate;
2. the applicant has the necessary infrastructure like adequate office space, equipment and the manpower to effectively discharge the activities of a portfolio manager;
3. the applicant has appointed a compliance officer;
4. the principal officer[27] of the applicant has a) a professional qualification in finance, law, accountancy or business management from a university or an institution recognized by the Central Government or any State Government or a foreign university or a professional qualification by completing a Post Graduate Program in the Securities Market (Portfolio Management) from NISM of a duration not less than one year or a professional qualification by obtaining a CFA charter from the CFA institute; b) experience of at least five years in related activities in the securities market including in a portfolio manager, stock broker, investment advisor, research analyst or as a fund manager; [28] and c) the relevant NISM certification as specified by SEBI from time to time.
5. In addition to the Principal Officer and Compliance Officer, the applicant has in its employment at least one person who has a graduation from a university or an institution recognized by the Central Government or any State Government or a foreign university; and an experience of at least two years in related activities in the securities market including in a portfolio manager, stock broker, investment advisor or as a fund manager. Further, any employee of the Portfolio Manager, who has decision making authority related to fund management shall have the same minimum qualification, experience and certification as specified by the Principal Officer.
6. Any disciplinary action has been taken by SEBI against a person directly or indirectly connected with the applicant.
7. The applicant fulfils the net worth requirement (Rupees five crore).

[27] "principal officer" means an employee of the portfolio manager who is responsible for:-
(A) the decisions made by the portfolio manager for the management or administration of portfolio of securities or the funds of the client, as the case may be.
(B) the overall supervision of the operations of the portfolio manager.

[28] Provided that atleast 2 years of relevant experience in portfolio management or investment advisory services or in the areas related to fund management..

8. The applicant, its director or partner, principal officer, compliance officer or the employee is involved in any litigation connected with the securities market that has an adverse bearing on the business of the applicant.
9. The applicant, its director or partner, principal officer, compliance officer or the employee has at any time been convicted for any offence involving moral turpitude or has been found guilty of any economic offence.
10. The applicant is a fit and proper person.
11. The grant of certificate to the applicant is in the interest of investors.

The certificate of registration granted shall be valid unless it is suspended or cancelled by SEBI.

7.5 General Responsibilities of a Portfolio Manager

The Portfolio Managers Regulations by SEBI has enumerated the following general responsibilities on the portfolio managers:

1. The discretionary portfolio manager shall individually and independently manage the funds of each client in accordance with the needs of the client, in a manner which does not partake character of a Mutual Fund, whereas the non-discretionary portfolio manager shall manage the funds in accordance with the directions of the client.
2. The portfolio manager shall not accept from the client, funds or securities worth less than fifty lakh rupees. Provided that the minimum investment amount per client shall be applicable for new clients and fresh investments by existing clients. Provided further that subject to appropriate disclosures in the disclosure document and the terms agreed between the client and the portfolio manager, the requirement of minimum investment amount per client shall not apply to an accredited investor. Provided further that the requirement of minimum investment amount per client shall not apply to the co-investment portfolio manager.
3. The portfolio manager shall act in a fiduciary capacity with regard to the client's funds.
4. The portfolio manager shall segregate each client’s holding in securities in separate accounts.
5. The portfolio manager shall keep the funds of all clients in a separate account to be maintained by it in a Scheduled Commercial Bank.
6. The portfolio manager shall transact in securities within the limitation placed by the client himself with regard to dealing in securities under the provisions of the Reserve Bank of India Act, 1934 (2 of 1934).
7. The portfolio manager shall not derive any direct or indirect benefit out of client's funds or securities.
8. The portfolio manager shall not borrow funds or securities on behalf of the client.
9. The portfolio manager shall not lend securities held on behalf of the clients to a third person except as provided under these regulations.

10. The portfolio manager shall ensure proper and timely handling of complaints from his clients and take appropriate action immediately.
11. The portfolio manager shall ensure that any person or entity involved in the distribution of its services is carrying out the distribution activities in compliance with these regulations and circulars issued thereunder from time to time.

7.6 Administration of investor's portfolio

The portfolio manager has to manage and administer the funds of the investors within the regulatory framework. There are two popular models of execution. First one is pool execution i.e. trading for all clients together and then allocating individual securities to each client's demat account and the other one is trading in individual client name. In this case, allocation happens automatically since trade is in individual name. The portfolio manager enters into an agreement in writing before taking up an assignment of management of funds and portfolio on behalf of a client. The agreement clearly defines the relationship and sets out their mutual rights, liabilities and obligations relating to management of portfolio. The following are some aspects regarding the administration of the funds.

7.6.1 Defining the universe of securities for the purpose of investments

The agreement between the portfolio manager and the client includes the investment approach. An investment approach is a broad outlay of the type of securities and permissible instruments to be invested in by the portfolio manager for the customer, taking into account factors specific to clients and securities. The agreement also includes the areas of investment and restrictions, if any, imposed by the client with regard to the investment in a particular company or industry. Thus, the universe of securities for the purpose of investments is well defined in the agreement. As mentioned, it is a regulatory requirement.

7.6.2 Circumstances leading to pre-mature withdrawal of funds

The funds or securities can be withdrawn or taken back by the client before the maturity of the contract. However, the terms of premature withdrawal would be as per the agreement between the client and the portfolio manager.

The agreement between the portfolio manager and the client should include the terms for early withdrawal of funds or securities by the clients. It should also include the withdrawal fees in terms of percentage as well as the amount. Portfolio managers cannot impose a lock-in on the investment of their clients.

As the PMS Circular dated February 13, 2020[29] in case client portfolio is redeemed in part or full, the exit load charged shall be as under:

a) In the first year of investment, maximum of 3% of the amount redeemed.
b) In the second year of investment, maximum of 2% of the amount redeemed.
c) In the third year of investment, maximum of 1% of the amount redeemed.
d) After a period of three years from the date of investment, no exit load.

7.6.3. Do's and Don'ts for the portfolio managers

The portfolio manager shall abide by the provisions of the SEBI Act, 1992 and the regulations. Following are the Do's and Don'ts for portfolio managers.
Do's:

1. The portfolio manager shall take adequate steps for redressal of grievances of the investors within the time stipulated by SEBI and keep SEBI informed about the number, nature and other particulars of the complaints received. [30]
2. Portfolio manager shall abide by the Code of Conduct.
3. The portfolio manager shall segregate each client's holding in securities in separate accounts.
4. The portfolio manager shall keep the funds of all clients in a separate account to be maintained by it in a Scheduled Commercial Bank.
5. The portfolio manager shall transact in securities within the limitation placed by the client himself with regard to dealing in securities under the provisions of the Reserve Bank of India Act, 1934 (2 of 1934).
6. The portfolio manager shall segregate each clients' funds and portfolio of securities and keep them separately from his own funds and securities and be responsible for safekeeping of clients' funds and securities.

Don'ts:

1. The portfolio manager shall not derive any direct or indirect benefit out of the client's funds or securities.
2. The portfolio manager shall not borrow funds or securities on behalf of the client.
3. The portfolio manager shall not lend securities held on behalf of the clients to a third person except as provided under SEBI Portfolio Managers regulations.
4. The money or securities accepted by the portfolio manager shall not be invested or managed by the portfolio manager except in terms of the agreement between the portfolio manager and the client.

[29]https://www.sebi.gov.in/legal/circulars/feb-2020/guidelines-for-portfolio-managers_45981.html

[30] https://www.sebi.gov.in/legal/regulations/aug-2023/securities-and-exchange-board-of-india-portfolio-managers-regulations-2020-last-amended-on-august-18-2023-_76366.html

5. The portfolio manager while investing in units of mutual funds through direct plan shall not charge any kind of distribution related fees to the client.
6. The portfolio manager shall not leverage the portfolio of its clients for investment in derivatives.
7. The portfolio manager shall not deploy the clients' funds in bill discounting, badla financing or for the purpose of lending or placement with corporate or non-corporate bodies.
8. The portfolio manager shall not invest the clients' funds in the portfolio managed or administered by another portfolio manager.
9. The portfolio manager shall not invest client's fund based on the advice of any other entity.
10. The portfolio manager shall not while dealing with clients' funds indulge in speculative transactions i.e., it shall not enter into any transaction for purchase or sale of any security which is periodically or ultimately settled otherwise than by actual delivery or transfer of security except the transactions in derivatives.
11. The portfolio manager shall, ordinarily purchase or sell securities separately for each client. However, in the event of aggregation of purchases or sales for economy of scale, *inter se* allocation shall be done on a *pro rata* basis and at weighted average price of the day's transactions. The portfolio manager shall not keep any open position in respect of allocation of sales or purchases effected in a day.
12. The portfolio manager shall not hold the securities belonging to the portfolio account, in its own name on behalf of its clients either by virtue of contract with clients or otherwise.
13. The portfolio manager shall not execute off market transfers in client's account except:

    (a) for settlement of the clients' own trades;
    (b) for providing margin/ collateral for clients' own positions;
    (c) for dealing in unlisted securities in accordance with the regulations;
    (d) with specific consent of the client for each transaction;
    (e) for any other reason specified by SEBI from time to time.

7.6.4. Appointment of custodian

Except for the portfolio manager who provides only the advisory services, every portfolio manager shall appoint a custodian in respect of securities managed or administered by it. Details of custodian like its Name, Address, SEBI Registration No., Date of Appointment need to be furnished in the application for obtaining registration to the regulator.

7.6.5. Maintenance of records

Every portfolio manager shall keep and maintain the following books of accounts, records and documents namely:

(a) a copy of balance sheet at the end of each accounting period;
(b) a copy of the profit and loss account for each accounting period;
(c) a copy of the auditor's report on the accounts for each accounting period;
(d) a statement of financial position and;
(e) records in support of every investment transaction or recommendation which will indicate the data, facts and opinion leading to the investment decision.

Such records are maintained under the hands of the Principle Officer of the portfolio manager.

The portfolio manager should intimate to SEBI the place where the books of accounts, records and documents are maintained. The portfolio manager should after the end of each accounting period, furnish to SEBI copies of the balance sheet, profit and loss account and such other documents. It should furnish to SEBI a net worth certificate issued by a chartered accountant as and when required. The portfolio manager is required to preserve the books of account and other records and documents for preceding five accounting years and furnish to SEBI as and when required.

7.6.6. Accounts and audit

The portfolio manager shall maintain separate client-wise accounts. The funds received from the clients, investments or disinvestments, all the credits to the account of the client like interest, dividend, bonus, or any other beneficial interest received on the investment and debits for expenses, if any, shall be properly accounted for and details thereof shall be properly reflected in the client's account.

The tax deducted at source as required under the provisions of the Income-Tax Act, 1961, (43 of 1961) shall be recorded in the portfolio account.

The books of account will be audited yearly by qualified auditor to ensure that the portfolio manager has followed proper accounting methods and procedures and that the portfolio manager has performed his duties in accordance with the law.

The portfolio accounts of the portfolio manager shall be audited annually by an independent chartered accountant and a copy of the certificate issued by the chartered accountant shall be given to the client.

The client may appoint a chartered accountant to audit the books and accounts of the portfolio manager relating to his transactions and the portfolio manager shall co-operate with such chartered accountant in course of the audit.

The Portfolio Managers is required consider all clients' portfolios managed (discretionary and non-discretionary) for audit of firm- level performance. The terms of reference (ToR) for the said audit shall be as specified in consultation with Association of Portfolio Managers of India (APMI).

Portfolio Managers shall submit the confirmation of above compliance to SEBI within the stipulated time period.[31]

7.6.7. Appointment of compliance officer

Every portfolio manager shall appoint a compliance officer who shall be responsible for monitoring the compliance of the Act, rules and regulations, notifications, guidelines, instructions etc., issued by SEBI or the Central Government and for redressal of investors' grievances. The compliance officer shall immediately and independently report to SEBI any non- compliance observed.

[31] https://www.sebi.gov.in/legal/circulars/aug-2023/audit-of-firm-level-performance-data-of-portfolio-managers_74900.html

Chapter 7: Sample Questions

1) The net worth requirement to be registered as a PMS provider, as per SEBI(Portfolio Managers)Regulations, 2020, is?

a. Rs. 5 crore
b. Rs. 2 crore
c. Rs. 50 lakhs
d. Rs. 10 crore

2) An _____ is a broad outlay of the type of securities and permissible instruments to be invested in by the portfolio manager for the customer, taking into account factors specific to clients and securities.

a. investment approach
b. investment statement
c. investment objectives
d. investment profile

3) Except for the one that provides only the _____, every portfolio manager shall appoint a custodian in respect of securities managed or administered by it.

a. advisory services
b. discretionary services
c. Non-discretionary services
d. None of the above

4) The following is the requirement for granting the certificate of registration under Portfolio Managers Regulations 2020:

a. the applicant is a body corporate;
b. the applicant has the necessary infrastructure like adequate office space, equipment and the manpower to effectively discharge the activities of a portfolio manager;
c. the applicant has appointed a compliance officer;
d. all of the above

5) _____ portfolio manager manages the funds in accordance with the directions of the client.

a. Non-discretionary
b. Discretionary
c. Advisory
d. All the above

CHAPTER 8: OPERATIONAL ASPECTS OF PORTFOLIO MANAGERS

LEARNING OBJECTIVES:

After reading this chapter, the reader should know about:

- Entities which can invest in a PMS
- Disclosures made by the PMS to the prospective investors
- The process of onboarding of clients
- Content of agreement between the portfolio manager and investor
- PMS's liability in case of default
- Disclosures requirements of PMS to various regulators
- Costs, expenses and fees of investing in PMS

8.1 Entities which can invest in PMS

The following entities can invest in PMS with a minimum investment of Rs. 50 lacs:

- Individuals
- Non-resident Indians (as per the RBI guidelines)
- Hindu Undivided Family
- Proprietorship firms
- Association of person
- Partnership Firms
- Limited liability Partnership
- Trust
- Body Corporate

8.2 Disclosures to the prospective clients

Accurate and standardized disclosure by PMS providers is needed to help existing & prospective investors take well informed investment decisions.

SEBI (Portfolio Managers) Regulation 2020 requires that the disclosure document is to be given to the prospective client along with the account opening form prior to signing of the agreement. This change in the regulation has been made in 2020. Prior to this change, disclosure document was to be given to the prospective client along with the account opening form at least two days in advance of signing of the agreement. Keeping audit trail of each client having received the disclosure document at least two days prior to agreement execution appeared to be an onerous task and resulted in gaps in the process of keeping track of the same, as noted by the working group on the portfolio managers regulation, 1993. Therefore, it proposed that the requirement of providing disclosure document to the prospective client at least two days prior to signing the PMS agreement be discontinued.

Instead, it may be mandated that disclosure document be provided at any time before or at the time of entering into the agreement vide hard/soft copy and be made available at all times on Portfolio Manager's website. Due care shall be taken to present the information in simple language and in a clear, concise and easily understandable manner in the disclosure document.

SEBI, in consultation with APMI, has introduced a simplified Disclosure Document format via SEBI Circular dt. Sep 09, 2025. The contents of the disclosure document are given below.

Part -I: **Static Section**

No.	Heading	Content
1	Disclaimer clause	A statement to the effect that the particulars have been prepared in accordance with the SEBI (Portfolio Managers) Regulations, 2020 and filed with SEBI. This Document has neither been approved or disapproved by SEBI nor has SEBI certified the accuracy or adequacy of the contents of the Document.
2	Definitions	All terms used in the Disclosure Document be defined. The language and terminology used in the Disclosure Document shall be as provided in the Regulations. Any new term if used shall be clearly defined. All terms shall be used uniformly throughout the text of the Disclosure Document.
3	Description	History, Present Business and Background of the portfolio manager. Promoters of the portfolio manager, directors and their background. Top 10 Group companies/firms of the portfolio manager on turnover basis (latest audited financial statements may be used for this purpose). Details of the services being offered: Discretionary/ Non-discretionary / Advisory.
4	Penalties, pending litigation or proceedings, findings of inspection or investigation for which action may have been taken or initiated by any regulatory authority.	All cases of penalties imposed by SEBI or the directions issued by SEBI under the SEBI Act or rules or regulations made thereunder. The nature of the penalty/direction. Penalties/fines imposed for any economic offence and/ or for violation of any securities laws.

		Any pending material litigation/legal proceedings against the portfolio manager/key personnel with separate disclosure regarding pending criminal cases, if any. Any deficiency in the systems and operations of the portfolio manager observed by SEBI or any regulatory agency. Any enquiry/ adjudication proceedings initiated by SEBI against the portfolio manager or its directors, principal officer or employee or any person directly or indirectly connected with the portfolio manager or its directors, principal officer or employee, under the Act or rules or regulations made thereunder.
5	Services Offered	The present investment objectives and policies including the types of securities in which it generally invests shall be clearly and concisely stated in the document for easy understanding of the potential investor. Investment Approaches of the Portfolio Manager The policies for investments in associates/group companies of the portfolio manager and the maximum percentage of such investments therein subject to the applicable laws/regulations/ guidelines.
6	Risk factors	Statement to the effect that securities investments are subject to market risks and there is no assurance or guarantee that the objective of the investments will be achieved. Statement to the effect that past performance of the portfolio manager does not indicate its future performance. Risk arising from the investment approach, investment objective, investment strategy and asset allocation. Risk arising out of non-diversification, if any. If the portfolio manager has no previous experience/ track record a disclosure to that effect shall be made. All transactions of purchase and sale of securities by portfolio manager and its employees who are directly involved in investment operations shall be disclosed if found having conflict of interest with the transactions in any of the client's portfolio.

		If the portfolio manager has group companies, a disclosure of conflict of interest related to services offered by group companies of the portfolio manager if any.
7.	Nature of expenses	Investment management and advisory fees. Custodian fee Registrar and transfer agent fee Brokerage and transaction cost.
8.	Taxation	Disclose the tax implications of investments in securities and the tax provisions on Income/ Loss or Tax Deduction at Source on various investors.
9.	Accounting policies	Disclose the accounting policy followed by the portfolio manager while accounting for the portfolio investments of the clients.
10.	Investors services	Name, address and telephone number of the investor relation officer who shall attend to the investor queries and complaints. Grievance redressal and dispute settlement mechanism.
11.	Details of the diversification policy of the portfolio manager	The details of the diversification policy of the portfolio manager for the portfolio of the clients.

Part-II: **Dynamic Section**

No.	**Heading**	**Content**
12.	Client Representation	Category of clients No. of clients Funds managed Discretionary / Non- Discretionary *(if available)* Associate/group companies (last 3 years) Others (last 3 years) Total Complete disclosure in respect of transactions with related parties as per the standards specified by the Institute of Chartered Accountants of India.
13.	Financial Performance	The Financial Performance of the portfolio manager based on audited financial statements and in terms of procedure specified by SEBI for assessing the performance.

14.	Performance of Portfolio Manager	Portfolio Management performance of the portfolio manager for the last three years, and in case of discretionary portfolio manager disclosure of performance indicators calculated using 'Time Weighted Rate of Return' method.
15.	Audit Observations	Audit observations of the preceding 3 years
16.	Details of investments in the securities of related parties of the portfolio manager	The details of investment of client's funds by the portfolio manager in the securities of its related parties or associates.

8.2.1 Written down policies by Portfolio Manager

Portfolio Managers shall put in place a written down policy, which detail the specific activities, role and responsibilities of various teams engaged in fund management, dealing, compliance, risk management, back-office, etc., with regard to management of client funds and securities including the order placement, execution of order, trade allocation amongst clients and other related matters.

Portfolio Managers shall also put in place a specific policy, which provide for the following:

- Specific situations (not generic) wherein the orders shall be placed foreach client individually or pooled from trading account of Portfolio Manager.
- Scenarios/situations in which deviation from the allotment of securities as intended at the time of placement of order would be permissible, if at all.
- Scenarios, wherein, the Portfolio Manager is required to place certain margins/collaterals in order to execute certain transactions, details onhow such margins/collaterals shall be segregated/placed from amongst various clients, without affecting the interest of any client.
- Deviations, if any, shall be on account of exigency only and require prior written approval of the Principal Officer and Compliance officer ofthe Portfolio Manager with a detailed rationale for such deviation.

These policies as need to be approved by the Board/equivalent body of the Portfolio Manager.

Fair and equitable treatment of all clients

Portfolio Managers shall ensure that all clients are treated in a fair and equitable manner and ensure compliance with the following:

Requirements with respect to investments in all instruments:

- Portfolio Managers shall constitute a Dealing Team (DT) which shall be responsible for order placement and execution of all orders in accordance with the aforesaid policies of the Portfolio Manager. DT may include the Principal Officer or the person appointed in terms of Regulation 7(2) (e) of the PM Regulations.
- Portfolio Managers shall ensure that DT is suitably staffed and comply with the following:
    - All conversations of DT shall be only through the dedicated recorded telephone lines or through emails from authorized email ids.
    - Mobile phones or any other communication devices other than the recorded telephone lines shall not be allowed inside the dealing room.
    - Access to internet facilities on computers and other devices inside the dealing room shall be restricted and shall only be used for activities related to trade execution.
    - Entry/access to the dealing room shall be restricted to authorized employees as defined in the aforementioned policies of the Portfolio Manager.
    - There shall be no sharing of information through any mode, except for trade execution under the approved policies of the Portfolio Manager.
- For equity, equity-related instruments and Mutual Funds units [27]
    - Portfolio Managers with assets under management of INR 1000 crores or more under discretionary and non-discretionary services, shall have in place an automated system with minimal manual intervention for ensuring effective funds and securities management including order management and allocation of securities to each client.

Portfolio Managers shall maintain audit trail of all activities related to management of funds and securities of clients including order placement,trade execution and allocation. Further, there shall be time stamping withrespect to order placement, order execution and trade allocation.

8.2.2 Best Practices for the disclosures – Global Investment Performance Standards (GIPS®)[32]

The GIPS standards are ethical standards for calculating and presenting investment performance based on the principles of fair representation and full disclosure. These standards were originally created for investment firms managing composite strategies, with a focus on how firms present performance of composites to prospective clients. Asset

[32]GIPS® is a registered trademark owned by CFA Institute. The GIPS standards are a set of standardized, industry-wide ethical principles that guide investment managers and asset owners on how to fairly calculate and present their investment results, with the goal of promoting performance transparency and comparability. https://www.cfainstitute.org/-/media/documents/code/gips/2020-gips-standards-firms.ashx

managers and both existing and prospective clients benefit from an established global standard for calculating and presenting investment performance.

Following are **some** of the disclosure requirements by GIPS:

Here the term firm is used as the entity defined for compliance with the GIPS standards.

1. The firm must disclose the composite description. A composite is an aggregation of one or more portfolios that are managed according to a similar investment mandate, objective, or strategy. The idea is to enable a prospective client to understand the key characteristics of the composite's investment mandate, objective, or strategy, including:
    a. The material risks of the composite's strategy.
    b. How leverage, derivatives, and short positions may be used, if they are a material part of the strategy.
    c. If illiquid investments are a material part of the strategy.
2. The firm must disclose the benchmark description, which must include the key features of the benchmark or the name of the benchmark for a readily recognized index or other point of reference.
3. When presenting gross-of-fees returns, the firm must disclose if any other fees are deducted in addition to transaction costs.
4. When presenting net-of-fees returns, the firm must disclose:
    a. If any other fees are deducted in addition to investment management fees and transaction costs.
    b. If net-of-fees returns are net of any performance-based fees or carried interest.
    c. If model or actual investment management fees are used.
    d. If model investment management fees are used, and composite gross-of- fees returns are not presented, the model investment management fee used to calculate net-of-fees returns.
    e. If model investment management fees are used, the methodology used to calculate net-of-fees returns.
5. The firm must disclose which fees and expenses other than investment management fees (e.g., research costs) are separately charged by the firm to clients, if material.
6. The firm must disclose or otherwise indicate the reporting currency.
7. The firm must disclose which measure of internal dispersion is presented.
8. The firm must disclose the current fee schedule appropriate to prospective clients or prospective investors.
9. If the fee schedule includes performance-based fees or carried interest, the firm must disclose the performance-based fee description or carried interest description.
10. The firm must disclose the composite inception date and creation date.

11. The firm must disclose that policies for valuing investments, calculating performance, and preparing GIPS reports are available upon request.
12. The firm must disclose how leverage, derivatives, and short positions have been used historically, if material.
13. If the firm determines that no appropriate benchmark for the composite exists, the firm must disclose why no benchmark is presented.
14. If a custom benchmark or combination of multiple benchmarks is used, the firm must:
    a. Disclose the benchmark components, weights, and rebalancing process, if applicable.
    b. Disclose the calculation methodology.
    c. Clearly label the benchmark to indicate that it is a custom benchmark.
15. If the firm presents additional risk measures, the firm must:
    a. Describe any additional risk measure.
    b. Disclose the name of the risk-free rate if a risk-free rate is used in the calculation of the additional risk measure.

8.3 Process of On-boarding of clients

The two important elements of the customer life cycle are: client onboarding and reporting.

The following are the important aspects of the client onboarding process in case of a PMS service:

1. Reading of disclosure document

SEBI (Portfolio Managers) Regulation 2020 requires that the disclosure document is to be given to the prospective client along with the account opening form prior to signing of the agreement. Disclosure document is to be provided at any time before or at the time of entering into the agreement vide hard /soft copy and be made available at all times on Portfolio Manager's website.

2. Fulfilling KYC requirements

Investors need to fulfil certain mandatory requirements to be eligible to invest in PMS. The 'Know Your Customer (KYC)' process has to be undergone by all investors in compliance with the regulations of the Prevention of Money Laundering Act, 2002. In order to ensure that illegal funds are not routed into Indian markets, the government has promulgated the Prevention of Money Laundering Act (PMLA). According to this Act, the identity of those entering into financial transactions must be known and verified. The KYC process involves verification of proof of identity and proof of residence of the customer. Investor's identity has to be verified with a document carrying their photograph. Such identification can be a passport, driving license, voter's identity card, Aadhaar Card and the like. Proof of address

can be verified from address as stated in the passport, ration card, voter's identity card, and latest utility bills. The KYC process also requires verification of the PAN card. It is mandatory for all investors who wish to invest in PMS to complete KYC formalities.

Banks, depository participants, insurance companies, post office, brokers and other financial intermediaries like portfolio manager conduct the KYC compliance process at the time of initiating a transaction with an investor. An authorized official of the intermediary conducts an in-person verification (IPV) of the applicant as part of the process.

Investors deal with multiple capital market intermediaries such as asset management companies, depository participants (DPs), stock brokers, portfolio managers, venture capital funds and others. Investors were required, to undergo, the KYC process at the time of initiating transactions with each intermediary. To eliminate this duplication, SEBI has mandated a uniform KYC procedure for compliance by clients from January 1, 2012. This means that an investor who has undergone a KYC procedure with any of the specified intermediaries can use the same to invest with a portfolio manager and vice versa.

The KYC form has two parts. Part one will have information to establish identity and address, common to all intermediaries. Additional information as required by each intermediary can be collected using part two of the KYC form.

SEBI has introduced the system of KYC Registration Agency (KRA) to enable this. Intermediaries covered under the uniform KYC norms include mutual funds, DPs, stock brokers, portfolio managers, venture capital funds and collective investment schemes.

As per the 2015 amendment to PML (Maintenance of Records) Rules, 2005 every reporting entity shall capture the KYC information for sharing with the Central KYC Records Registry (CKYCR) in the manner mentioned in the Rules as per the KYC template for 'individuals' finalised by Central Registration of Securitisation Asset Reconstruction and Security Interest of India (CERSAI).[33]

Accordingly the KYC template finalised by CERSAI has to be used by the registered intermediaries as Part I of the Account Opening Form for individuals. The registered intermediaries shall upload the KYC data with Central KYC Records Registry (CKYCR) in respect of all individual accounts opened on or after August 1, 2016 where KYC is required to be carried out as per the circulars issued by SEBI from time to time.

When a customer submits a KYC identifier to a reporting entity, then such reporting entity shall download the KYC records from the Central KYC Registry by using the KYC Identifier and shall not require a customer to submit the documents again unless:

- There is a change in the information of the customer as existing in the records of Central KYC Registry.

- The current address of the client is required to be verified.
- The reporting entity considers it necessary in order to verify the identity or address of the client, or to perform enhanced due diligence or to build an appropriate risk profile of the client.

SEBI Directive on Inclusive Digital KYC for Person with Disability

SEBI vide circular Ref. No. SEBI/HO/MIRSD/SECFATF/P/CIR/2025/74 Dated May 23, 2025 has reiterated its commitment to enabling equal access to financial services through its registered intermediaries by ensuring that digital KYC processes are inclusive and accessible to person with disabilities, including those with visual impairments. Intermediaries are now mandated to offer assistive digital services.

KYC for Non-Residents

NRIs have to be KYC compliant in order to make investments in India. The following is the additional documentation, apart from proof of identity, proof of address and PAN card, for NRIs and PIOs:

- Certified True Copy of Passport
- Certified True Copy of the Overseas address
- Permanent address
- A certified true copy of the Person of Indian Origin (PIO) Card (for PIOs)
- In case of Merchant Navy NRIs, Mariner's declaration or certified copy of CDC (Continuous Discharge Certificate) is to be submitted.

All documents must be submitted in English and can be attested by the Consulate office or overseas branches of scheduled commercial banks registered in India.

The Central Board of Direct Taxes has notified Rules 114F to 114H, as part of the Income-tax Rules, 1962, that require Indian financial institutions to seek additional personal, tax and beneficial owner information and certain certifications and documentation from all investors/account holders.

From 2015, it is mandatory for an Indian financial institution to maintain and report the information pertaining to Foreign Account Tax Compliance Act (FATCA)/Common Reporting Standards (CRS) reportable accounts. In light of the above, it is mandatory for an Indian financial institution to obtain FATCA and CRS self-declaration from all investors (existing and new) to comply with the above Income Tax Rules read with Central Board of Direct Taxes(CBDT) guidelines. The common information mandated are fields such as—Name, Permanent Account Number (PAN), Address, Place (city/state) of birth, Country of birth Nationality, occupation and if a person is the resident of another country. If the country of residence is other than India then the Tax ID number, and type are required. In case of non-individual entities, the details of the Ultimate Beneficial owner (UBO) are also required to be submitted.

NRI Demat account

Non Resident Indians (NRIs) can open a demat account with any Depository Participant in India. NRI's needs to mention the type ('NRI' as compared to 'Resident') and the sub-type ('Repatriable' or 'Non- Repatriable') in the account opening form. No permission is required from RBI to open a demat account. However, credits and debits from demat account may require general or specific permissions as the case may be, from designated authorised dealers. Holding securities in demat only constitutes change in form and does not need any special permission.

NRI must open separate demat accounts for holding 'repatriable' and 'non-repatriable' securities. NRIs can hold joint demat accounts. For the purpose of determining ownership of holding, the first holder is taken into account. Hence, even though other joint holders may be person residing in India, the sale proceeds of such securities can be repatriated in case the first holder is permitted to repatriate funds.

NRI Trading account

NRI investors can open a trading account with a registered broker of a stock exchange. NRIs can have two separate trading accounts linked to Non-Resident (External)NRE & Non-Resident(Ordinary)NRO accounts.

Special considerations in case of NRI trading accounts:

- NRIs cannot trade in securities which are in the breach list (List of companies where foreign investment has reached its permissible limit as applicable for Foreign Portfolio Investor (FPI)/NRI/Overall Sectoral Limit).
- Clear funds should be available for purchases.
- Securities should be available before making a sell order.
- Depending upon whether the purchases are made on repatriation/non-repatriation basis, pay-out of the securities is transferred to the respective demat account.
- Purchase/Sale transactions in cash segment are settled by delivery only.
- The contract notes in original have to be submitted to the designated branch where the investor holds the Portfolio Investment Scheme(PIS) account within the time specified.

3. Submitting duly filled application form[34]:

The following format is given for the account opening form in Portfolio Managers Regulation 2020.

1) General information about the client

[34] Candidates are advised to check the latest account opening form from SEBI Website/Portfolio managers regulation.

(a) Name, primary mailing address, secondary (back up) mailing address, identity information such as photograph, Permanent Account Number (PAN), driving license etc.

(b) Occupation

(c) Introduced by (name and full address)

(d) Annual incomes for the last 3 financial years and the net worth as on the last date of the respective years. (optional)

2) Investment profile of the client

(a) Investment experience regarding securities.

(b) Indicative percentage of total investment portfolio proposed to be invested with the portfolio manager (optional).

(c) Overall investment goals such as capital appreciation or capital appreciation and regular income or regular income.

(d) Risk tolerance i.e. low, medium or high.

(e) Time period for which investments are proposed to be made with the portfolio manager. (This has to be same as the term of the agreement)

(f) Provisions for systematic withdrawal on a monthly, quarterly, annual basis etc.

3) Investment approach opted by the client

4) Details of portfolio construction for the client

(a) Equity: Nature of equities in which investments are desired, may be indicated.

(b) Balanced: Percentage of debt/equity.

(c) Debt: Government Bonds, corporate debt etc.

(d) Mutual funds,

(e) Others.

8.3.1. Content of agreement between the portfolio manager and investor[35]

The portfolio manager before taking up an assignment of management of funds and portfolio on behalf of a client, enters into an agreement in writing with such client that clearly defines the *inter se* relationship and sets out their mutual rights, liabilities, and obligations relating to management of portfolio. The portfolio manager shall enter into an agreement in writing with the clients that clearly defines the inter-se relationship and set out their mutual rights, liabilities and obligations. The clients also shall separately sign and add in their own handwriting (physical mode)/by typing or written electronically (digital mode) that they have understood the fee/charges structure.

The agreement between the portfolio manager and the client include the following:

1. the investment objectives and the services to be provided;
2. period of the contract and provision of early termination, if any;
3. investment approach, areas of investment and restrictions, if any, imposed by the client with regard to the investment in a particular company or industry;[36]
4. type of instruments and proportion of exposure;
5. tenure of portfolio investments;
6. terms for early withdrawal of funds or securities by the clients;
7. attendant risks involved in the management of the portfolio**;**
8. amount to be invested subject to the restrictions provided under these regulations;
9. procedure of settling client's account including form of repayment on maturity or early termination of contract;
10. fees payable to the portfolio manager;
11. the quantum and manner of fees payable by the client for each activity for which service is rendered by the portfolio manager directly or indirectly (where such service is out sourced);
12. custody of securities;
13. in case of a discretionary portfolio manager; a condition that the liability of a client shall not exceed his investment with the portfolio manager;
14. accounting terms, audit and furnishing of the reports to the clients as per the provisions of the regulations; and
15. other terms of portfolio investment subject to the prescribed regulations.

[Fee calculation tool shall be provided to all clients by the Portfolio Manager. Fee illustrations to be provided whenever performance fess is charged to clients. No additional fees and charges to be levied other than those specified in the agreement. The Portfolio Manager shall

[35] For details, candidates are advised to refer to Schedule IV of Portfolio Managers Regulations, 2020.

[36] An investment approach is a broad outlay of the type of securities and permissible instruments to be invested in by the portfolio manager for the customer, taking into account factors specific to clients and securities.

provide to clients a "most important Terms and Conditions (MITC)" document as per the standard format.][37]

8.4 Direct On-boarding in PMS

As per the SEBI circular, Portfolio Managers shall provide an option to clients to be on-boarded directly, without intermediation of persons engaged in distribution services. Portfolio Managers shall prominently disclose in its disclosure documents, marketing material and on its website, about the option for direct on-boarding. At the time of on-boarding of clients directly, no charges except statutory charges shall be levied. This provision with respect to direct on-boarding of clients shall not be applicable to co-investment PMS.

Alternatively, investors can invest in PMS through distributors.[38]

8.4.1 Process Flow

Investors can invest in PMS products in cash or in securities or a combination of the two worth minimum Rs. 50 lacs. The portfolio manager shall not accept from the client, funds or securities worth less than rupees fifty lacs. The valuation of the securities on the on-boarding date should meet the regulatory criteria. The portfolio manager may execute the sale of all or part of such securities to meet the investment objectives of the client within the investment approach.

8.4.2 Joint Holder in PMS

An investment in PMS may be held jointly. The investment records are created in the name of the first holder and all the benefits of the investment such as dividends, interest and redemption proceeds are made to the first holder's account. All the joint holders must sign the application and comply with the requirements of PAN and KYC norms. The mode of operating the account may be single, joint or anyone or survivor. Any change to the mode of operation, or addition or deletion of joint holders can be done only with the signatures of all holders. In case of a demat account, addition or deletion of holders is not allowed once the account is opened.

[37] https://www.sebi.gov.in/legal/circulars/may-2024/portfolio-managers-facilitating-ease-in-digital-on-boarding-process-for-clients-and-enhancing-transparency-through-disclosures_83147.html and https://www.apmiindia.org/storagebox/images/Circulars/APMI%20Circular%2011%20-%20Submissions%20by%20APMI%20vide%20SEBI%20Circular%20dated%202nd%20May'24.pdf

[38] https://www.sebi.gov.in/legal/circulars/feb-2020/guidelines-for-portfolio-managers_45981.html (SEBI Circular on Guidelines for Portfolio Managers dated February 13, 2020)

8.5 Liability in case of Default

The portfolio manager who contravenes any of the provisions of the SEBI Act, rules or regulations shall be liable including the action under Chapter V of the SEBI (Intermediaries) Regulations, 2008.

Chapter V the Securities and Exchange Board of India (Intermediaries) Regulations, 2008 includes the following actions in case of default:

1) suspension of certificate of registration for a specified period;
2) cancellation of certificate of registration;
3) prohibiting the portfolio manager to take up any new assignment or contract or launch a new scheme for the period specified in the order;
4) debarring a principal officer of the portfolio manager from being employed or associated with any registered intermediary or other registered person for the period specified in the order;
5) debarring a branch or an office of the portfolio from carrying out activities for the specified period;
6) warning the portfolio manager.

8.6 Redressal of investors grievances

The portfolio manager shall take adequate steps for redressal of grievances of the investors within the time stipulated by SEBI and keep SEBI informed about the number, nature and other particulars of the complaints received.[39] This is one of the conditions of obtaining certification of registration under regulations . Contents of agreement between the portfolio manager and his clients also includes provisions for redressal of grievances.

The portfolio manager is required to appoint a **compliance officer** who will be responsible for monitoring the redressal of investors' grievances. SEBI recently mandated an Online dispute redressal mechanism for all intermediaries to provide an Alternative Dispute Resolution Mechanism for investors.

With the said change, now the new process of dealing with investor grievance and disputes in the securities markets will be undertaken through the following measures:

(i) Time-bound mechanism for resolution of investor complaints by the concerned intermediary, Market Infrastructure Institution (MII), and through SCORES which is already existing framework

(ii) In the event of the complainant not being satisfied with the resolution, the MII administered dispute resolution process may be initiated by the aggrieved party

[39] https://www.sebi.gov.in/legal/regulations/aug-2023/securities-and-exchange-board-of-india-portfolio-managers-regulations-2020-last-amended-on-august-18-2023-_76366.html

(iii) In case either party is not satisfied with the arbitration award, such party may approach the courts.

The following amendment was made to SEBI PMS Regulations by inserting Regulation 22A through SEBI (Alternative Dispute Resolution Mechanism) (Amendment) Regulations, 2023 w.e.f July 3, 2023.

Dispute Resolution.22A. All claims, differences or disputes between investors and the portfolio manager arising out of or in relation to the activities of the portfolio manager in the securities market shall be submitted to a dispute resolution mechanism that includes mediation and/or conciliation and/or arbitration, in accordance with the procedure specified by the Board.

Further to the above ODR mechanism being made mandatory for PMS providers, let us discuss the same in details: -

Online Dispute Resolution (ODR) Mechanism:-

The various stages involved in the ODR process is given below:

a. Pre-Conciliation: This is an initial stage where the Market Infrastructure Institution (MII) facilitates an amicable discussion between the investor and the intermediary / listed company / regulated entity (Market Participant). Resolving an issue in pre-conciliation ensures that formal proceedings are not initiated.

b. Conciliation: This is a more formal process where a conciliator (a neutral third party) works with the disputing parties to reach a mutually acceptable agreement. It's like a facilitated negotiation with the goal of finding a compromise that all parties can agree on.

c. Arbitration: This is a legal process where a dispute is resolved by one or more arbitrators (neutral third parties) whose decision (the arbitral award) is binding and enforceable. It's like having a private judge who makes a final decision on the dispute.

The first two stages are free of cost for the investors.

Introduction of SMARTODR portal: To help investors access the ODR mechanism, an online platform has been developed through which investors may approach any Market Infrastructure Institution (MII) to lodge their request for dispute resolution. The request will be auto-assigned to a MII ODR platform based on round-robin logic. The intermediaries have to display the link of the said portal on their website and amend their existing agreements and inform clients for the availability of the new redressal process.

8.7 Disclosures to the regulator

Portfolio managers are required to make mandatory disclosure to regulatory bodies under various acts and regulation. The following sections gives the details of the same.

8.7.1 Disclosures to SEBI

SEBI may also ask portfolio manager to disclose any information as and when required including the following**:** -

(a) particulars regarding the management of a portfolio;

(b) any change in the information or particulars previously furnished, which have a bearing on the certificate granted to him;

(c) the names of the clients whose portfolio it has managed;

(d) particulars relating to the net worth requirement as specified in regulation 9 of Portfolio Managers Regulation 2020.

8.7.2 Disclosures to Financial Intelligence Unit – India

The Government of India has put a policy framework to combat money laundering through the Prevention of Money Laundering Act, 2002 (PMLA 2002). PMLA 2002 and the Rules notified there under (PMLA Rules) came into effect from July 1, 2005. SEBI has mandated that all registered intermediaries to formulate and implement a comprehensive policy framework on anti-money laundering and adopt 'Know Your Customer' (KYC) norms. Further, SEBI vide Circular No. CIR/ISD/AML/3/2010 dated December 31, 2010 (which supersedes all the earlier circular) issued a 'Master Circular for Anti Money Laundering (AML) Standards/ Combating the Financing of Terrorism (CFT) /Obligations of Securities Market Intermediaries under the Prevention of Money Laundering Act, 2002' consolidating all the requirements/instructions/obligations of Securities Market Intermediaries.[40] The Portfolio Manager is required to comply with all applicable anti money laundering laws and regulations in all of its operations.

Financial Intelligence Unit - India (FIU-IND) is the central, national agency responsible for receiving, processing, analysing and disseminating information relating to suspect financial transactions to enforcement agencies and foreign FIUs.

The portfolio manager is required to report any suspicious transaction within 7 working days to FIU.

[40] Candidates are advised to read the latest circular/guidelines on Anti-money laundering from SEBI website.

8.8 Costs, expenses and fees of investing in PMS

The portfolio manager can charge an agreed fee from the clients for rendering portfolio management services. The exact nature of these fees and expenses would form part of the client agreement. The following are the indicative lists of fees and expenses. The fees and expenses could vary depending on the asset class / type of portfolio. Also all these fees may apply to all kinds of portfolios.

Investment management and advisory fee : The fee so charged may be a fixed fee or a return based fee or a combination of both.

Custodian fee / Depository fee: The charges relating to opening and operation of dematerialized accounts, custody and transfer charges for shares, bonds and units, dematerialization and other charges in connection with the operation and management of the depository accounts.

Registrar and Transfer agent fee: Charges payable to registrars and transfer agents in connection with effecting transfer of securities and bonds including stamp charges cost of affidavits, notary charges, postage stamp and courier charges.

Brokerage and transaction costs: Brokerage and related transaction costs, are part of the acquisition cost / sale realization. Brokerage at actuals shall be charged to clients as expense.

Certification charges, Fund Accounting charges and Professional fee: Any charges payable for outsourced professional services like fund accounting, taxation, auditing, and any legal services, franking charges and notarizations, etc. incurred on behalf of the client by the portfolio manager.

Out of Pocket and Other Incidental Expenses: Charges in connection with day to day operations like courier expenses, stamp duty, document franking charges, notary charges, service tax, other statutory levies, postal and telephone expenses, opening of bank, trading and demat accounts and any other out of pocket expenses incurred by the portfolio manager, on behalf of the client.

As per regulation 22, the quantum and manner of payment of fees and charges for each activity for which services are rendered by the portfolio manager directly or indirectly (where such service is outsourced) such as investment management, advisory and transfer, and transaction costs with specific references to brokerage costs, custody charge etc. shall be mentioned in the agreement between the portfolio manager and its client. The portfolio manager shall take prior permission from the client in this respect.

In the disclosure document, a brief explanation shall be given to assist the investor in understanding the various costs and expenses that an investor may have to bear directly or indirectly.

In partial modification to circular on Regulation of Fees and Charges, issued in 2010, the following is mandated via circular issued by SEBI on Feb 13, 2020:

1. As provided in Regulation 22 (11) of the PMS Regulations, no upfront fees shall be charged by the Portfolio Managers, either directly or indirectly, to the clients.
2. Brokerage at actuals shall be charged to clients as expense.
3. Operating expenses excluding brokerage, over and above the fees charged for Portfolio Management Service, shall not exceed 0.50% per annum of the client's average daily Assets under Management (AUM).
4. In case client portfolio is redeemed in part or full, the exit load charged shall be as under: [41]

   a) In the first year of investment, maximum of 3% of the amount redeemed. b) In the second year of investment, maximum of 2% of the amount redeemed. c) In the third year of investment, maximum of 1% of the amount redeemed. d) After a period of three years from the date of investment, no exit load.

8.8.1. High Water Mark

High Water Mark is the highest value that the portfolio/account has reached. The portfolio manager charges performance based fee only on increase in portfolio value in excess of the previously achieved high water mark.

For example, suppose a client's initial contribution is Rs.100,00,000, which then rises to Rs.120,00,000 in its first year; a performance fee/ profit sharing would be payable on the Rs.20,00,000 return. In the next year the portfolio value drops to Rs.110,00,000 hence no performance fee would be payable. If in the third year the Portfolio rises to Rs.130,00,000, a performance fee/profit sharing would be payable only on the Rs. 10,00,000 profit which is portfolio value in excess of the previously achieved high water mark of Rs.120,00,000, rather than on the full return during that year from Rs.110,00,000 to Rs.130,00,000.

8.8.2. Hurdle Rate

Profit sharing/performance related fees are usually charged by portfolio managers upon exceeding a hurdle rate or benchmark as specified in the agreement. An illustration of performance fee is presented below:[42]

[41] https://www.sebi.gov.in/legal/circulars/feb-2020/guidelines-for-portfolio-managers_45981.html (SEBI/HO/IMD/DF1/CIR/P/2020/26February 13,2020)

[42] Source: SEBI FAQ dated October 28, 2020.

Particulars	Year 1	Year 2	Year 3	Year 4
Initial Corpus	50,00,000	65,92,000	47,98,976	70,92,887
Hurdle rate of return (A)	8%	8%	8%	8%
Performance fee over hurdle rate (B)	20%	20%	20%	20%
Fixed Fee (C)	1.5%	1.5%	1.5%	1.5%
Brokerage p.a. (D)	0.20%	0.20%	0.20%	0.20%
Other Expenses (E)	0.50%	0.50%	0.50%	0.50%
Rate of return on the portfolio (I)	40%	-25%	50%	40%

Assumptions:

1. Performance linked fee and fixed management fee are calculated on an annual basis (i.e, performance period = 1 year)
2. All figures in the tables have been assumed for the purpose of illustration
3. Other expenses mentioned include Custody & FA charges, RTA fees etc

All amounts in Rs. & all returns are pre-tax

Box 8.1: Calculation of Performance Fee

Sl No.	Particulars	Year 1		Year 2		Year 3		Year 4		Year 5
1	**Initial corpus**	50,00,000		65,92,000		47,98,976		70,92,887		
	Hurdle Rate (A)	8.00%		8.00%		8.00%		8.00%		
	Performance fee over hurdle rate (B)	20.00%		20.00%		20.00%		20.00%		
	Fixed Fee (C)	1.50%		1.50%		1.50%		1.50%		
	Brokerage p.a. (D)	0.20%		0.20%		0.20%		0.20%		
	Other expenses (E)	0.50%		0.50%		0.50%		0.50%		
	Rate of return on Portfolio (I)	**40.00%**		**-25.00%**		**50.00%**		**40.00%**		
		Year 1		**Year 2**		**Year 3**		**Year 4**		
		Amount in Rs.		**Amount in Rs.**		**Amount in Rs.**		**Amount in Rs.**		
1	**Amount invested by client/opening value**	**50,00,000**		**65,92,000**		**47,98,976**		**70,92,887**		
2	**Portfolio returns during the year (=I*1)**	20,00,000		-16,48,000		23,99,488		28,37,155		
3	Brokerage and transaction cost at 20 bps **(=D*1)**	10,000		13,184		9,598		14,186		
4	Other expenses **(=E*1)**	25,000		32,960		23,995		35,464		
5	Fixed management fee **(=C *1)**	75,000		98,880		71,985		1,06,393		
6	**Pre performance fee closing value of portfolio 1+2-3-4-5**	68,90,000	**70,00,000**	47,98,976	**49,44,000**	70,92,887	**71,98,464**	97,73,998	**99,30,041**	
7	Returns realised by investor (pre-performance fee) over High Water Mark **(= (6-14)/14*100)** [For Year 1, returns over initial corpus would be considered]	37.80%		-30.35%		2.94%		37.80%		
8	Returns realised by investor over hurdle rate **(= 7-A,** and in case of negative returns, it shall be zero)	29.80%		0%		-5.06%		29.80%		
9	Performance fee levied by PM (in %) **(Perf. Fee = 8*B)**	5.96%		0%		0%				
10	**Amount of performance fee recovered by PM (high-watermark applicable) on Capital Amount (= 9*1)**	**2,98,000**		-		-		**4,22,736**		
11	Total Charges During the year **(=3+4+5+10)**		4,08,000	-	1,45,024		1,05,577		5,78,779	
12	Net Value of the portfolio at the end of year **(=1+2-11)**		65,92,000		47,98,976		70,92,887		93,51,262	
13	**Overall Returns to investor in % (=(12-1)/1) *100**		**31.84%**		**-27.20%**		**47.80%**		**31.84%**	
14	**High Water Mark for calculation of performance fee for the next performance period** (6)			68,90,000		68,90,000		70,92,887		97,73,998

Chapter 8: Sample Questions

1. The following entity is not eligible to invest into PMS:
    a. Proprietorship firms
    b. Association of person
    c. Partnership Firms
    d. None of the above

2. The following entities can invest in PMS:
    a. Individuals
    b. Non-resident Indians (as per the RBI guidelines)
    c. Hindu Undivided Family
    d. All the above

3. The minimum investment required for PMS investment is:
    a. Rs. 50 lacs
    b. Rs. 25 Lacs
    c. Rs. 5 Lacs
    d. Rs. 100 Lacs

4. _____ is the central, national agency responsible for receiving, processing, analysing and disseminating information relating to suspect financial transactions to enforcement agencies.

    a. FIU-IND
    b. SEBI
    c. RBI
    d. CBI

5 The agreement between the portfolio manager and the client should include the following:

    a. the investment objectives and the services to be provided
    b. period of the contract and provision of early termination, if any
    c. investment approach, areas of investment and restrictions, if any, imposed by the client with regard to the investment in a particular company or industry
    d. **all the above**

Sample Caselets

1. An investor stipulates a hurdle rate of 20% p.a. on a Rs.1 crore fund assigned to a portfolio manager with all the discretion given to the PMS. As performance fee, the PMS decided to charge 30% over the hurdle rate, over and above a fixed charge of 1.5% p.a., Brokerage and other expenses of 0.2% and 0.5%, respectively, of the net AUM invested at the beginning of the year. During the first year, the portfolio earnt 35% on the initial fund invested. How much performance fee will be payable to the portfolio manager?

    a) Rs.3,84,000
    b) Rs.39,84,000
    c) Rs.36,00,000
    d) Nil

    Answer: a) Rs. 3,84,000
    Explanation: {[(1 cr *(1.35)) – (1cr *(0.015+0.005+0.002))] - [1 cr * (1.20)]} * 0.3 = 3,84,000

Initial Investment	10000000
Hurdle Rate	20%
Fixed Fee	1.50%
Brokerage	0.50%
Other Expenses	0.20%
1*Performance Fee	30%
Return on the Portfolio	35%
Portfolio Value with Return	13500000
Less Fixed Fee	150000
Less Brokerage	50000
Less Other Expenses	20000
Pre Performance Fee Value	13280000
Fund Value with Hurdle Rate	12000000
Excess over Client's Hurdle	1280000
Performance Fee to be charged ***(Excess over Client's hurdle * performance fee)***	3,84,000

2. A fund manager is interested to calculate her performance fees for the second year of fund management. She started with a net fund value of Rs.1,28,96,000 and generated a return of 25% for the second year. As per the SEBI guidelines the high water mark fund value has to be Rs.1,32,80,000. The hurdle rate given by the client is 20% and the

fund manager negotiated 30% towards performance fees. The fixed charges, brokerage and other expenses are 1.5%, 0.5% and 0.2% respectively. How much performance fees can she charge this year?

a) NIL
b) Rs.39,84,000
c) Rs.48,36,000
d) Rs.47,50,886.40

Answer: a) NIL
Explanation:
{[12896000*(1.25) - (12896000*(0.015+0.005+0.002))] -13280000}/13280000 = less than 20%

High water mark fund value	1,32,80,000
Net Value of the Portfolio	1,28,96,000
Return on the Portfolio	25%
Portfolio Value with Return	1,61,20,000
Less Fixed Fee	1,93,440
Less Brokerage	64,480
Less Other Expenses	25,792
Pre Performance Fee Value	1,58,36,288
Return over the High Water Mark	19.25%

CHAPTER 9: PORTFOLIO MANAGEMENT PROCESS

LEARNING OBJECTIVES:

After reading this chapter, the reader should be familiar with:

- Importance of Asset allocation decision
- Steps in Portfolio Management Process
- Need and constituents of Investment Policy Statement
- Difference between strategic and tactical asset allocation
- Benefits and difficulties of rebalancing the portfolios

9.1. Importance of Asset Allocation Decision

Asset allocation is the process of deciding how to distribute an investor's wealth into different asset classes for investment purposes. An asset class is defined as a collection of securities that have similar characteristics, attributes, and risk/return relationships. Examples of various asset classes are bonds, equities, cash and cash like securities etc., A broad asset class, such as "bonds," can be divided into sub-asset classes, like treasury bonds, corporate bonds, and junk bonds. Equity can further be divided into large cap, mid cap & small cap.

Asset allocation decision is a very important investment decision. Professional investment experience has been suggesting that in the long run, asset-allocation decision majorly influences the performance of investment portfolios. The asset allocation decision is not an isolated decision, it is a component of portfolio management process.

9.2 Understanding correlation across asset classes and securities

Correlation measures the strength and direction of relationship between two variables. Correlation coefficients vary in the range −1 to +1. A value of +1 (-1) indicates a perfect positive (negative) relationship between the two variables. A positive relationship between two variables means that they both move together in the same direction, either in an upward trend or downward trend. Negative relationship means the opposite. The value of the correlation coefficient indicates the strength of the relationship between the two variables. Understanding correlation across asset classes is very crucial in making asset allocation decision. As described in section 9.1, an asset class is described based on the similarity of characteristics of the assets, and as a natural consequence investments that are part of same asset class are sensitive to the same major economic and/or investment factors. Hence, the

correlation between assets that are part of the same asset class is expected to be high where correlation between two different asset classes is expected to be low. These assumptions hold good in normal circumstance that is when the economy, industry are stable. In situations of distress, like COVID-19 pandemic, the all-round fear, uncertainty, speculation about gloomy prospects, impacts all the asset classes in a similar way to a large extent, however this relationship reverses once the normalcy is regained.

Correlation is the most relevant factor in reaping the benefits of risk diversification i.e. in reducing portfolio risk. Correlations among asset class returns can and do change over time and also in different economic situations. Asset return correlation in future may also differ from those observed in the past because of changing economic and market regimes.

Investors should take these factors into consideration while making asset allocation decisions and should not solely depend on past correlation metrics.[43]

9.3 Steps in Portfolio Management Process

Portfolio management process involves a set of integrated activities undertaken in a logical, orderly and consistent manner to create and maintain an optimum portfolio. The elements in the portfolio management process are planning, execution and evaluation as discussed below:

1. The first step in the process of portfolio management is development of policy statement for the portfolio. It is a road map that identifies investors' risk appetite and defines investment objectives, goals and investment constraints.
2. The second step involves study of current financial conditions and forecast future trends.
3. The third step is construction of portfolio after taking into consideration policy statement and financial markets forecast. Investor needs and financial market forecasts being dynamic, portfolio requires continuous monitoring and rebalancing.
4. The fourth step in portfolio management process is performance measurement & evaluation.

Thus, the portfolio management process moves from planning through execution and then to feedback.

9.3.1 Investment Policy Statement (IPS)

Development of Investment Policy Statement (IPS) is the key step in the process of portfolio management. IPS is the road map that guides the investment process. Either investors or their advisors draft the IPS specifying their investment objectives, goals, constraints, preferences

[43] Financial services data integrators like Bloomberg, Capital IQ etc., provide information on correlation coefficient between various assets and securities. Alternatively, users can calculate correlation coefficient using simple Microsoft excel Functions.

and risks they are willing to take. All investment decision are based on IPS considering investors' goal and objectives, risk appetite etc.. Since investors requirement's change over a period time, IPS also needs to be updated and revised periodically. IPS forms the basis for strategic asset allocation which is essentially an interaction between investors risk-return requirements and expected investments' return.

9.3.2. Need for IPS

IPS is an important planning tool which help investors understand their requirements and also help portfolio managers in creating and maintaining optimum portfolios for the investors. Preparation of IPS inculcates a disciplined system and process in managing investments. It reduces the possibility of making inappropriate decisions.

There are four important purposes the policy statement serves:

1. It enables investors to have realistic return expectation from their investments.
2. It enables portfolio manager to make effective investment decisions.
3. It provides a framework for portfolio managers evaluation with respect to the investments.
4. It protects the investor against portfolio manager's inappropriate investment decisions or unethical behaviour.

In summary, a well-defined policy portfolio goes a long way in serving the investor's interest. It enables construction of an optimal investment portfolio.

9.3.3. Constituents of IPS

Since IPS is the most important document, it needs to be prepared with caution. The investor has to be upfront with the advisor or portfolio manager with regard to their financial situations, requirements and risk bearing temperament. The advisor or the manager preparing the IPS is also required to show utmost patience to obtain deep understanding of the investor's profile.

Under Current SEBI PMS Regulations, PMS providers are required to carry out risk profiling for investors before they undertake investments. Investors are expected to provide accurate and sincere answers to the questions asked in the 'Risk Questionnaire' which shall help the PMS provider properly assess the risk profile of the investor.

Some of the questions which needs to be incorporated in the said profiling are below -

(a) Investment experience regarding securities.

(b) Indicative percentage of total investment portfolio proposed to be invested with the portfolio manager (optional).
(c) Overall investment goals such as capital appreciation or capital appreciation and regular income or regular income.
(d) Risk tolerance i.e. low, medium or high.
(e) Time period for which investments are proposed to be made with the portfolio manager. (This has to be same as the term of the agreement)
(f) Provisions for systematic withdrawal on a monthly, quarterly, annual basis etc.

9.3.4. Investment Objectives

Investors' objectives are identified in relation to risk-return-liquidity. Risk is the variability in the expected returns. Return is the additional amount an investor generates over and above the initial investment, that is expressed as a percentage and per annum. Liquidity can be explained as the preference of an investor to convert her investment into cash, whenever required, without much delay, and loss in value of the investment. When this preference is sought after in an asset, then the same is expressed as a feature or characteristic of that asset, which makes it readily and easily sold out to another investor without much decline in its quoted value. Indirectly it conveys that the phenomenon of liquidity in finance needs a stable and vibrant financial market, with buyers and sellers always ready to invest and disinvest.

Investors may state their investment objectives in terms of desired return in absolute or relative sense. The desired absolute return is the return of the investment, measured on a standalone basis without any comparison with any other asset. Like an investor's objective could be "to generate 15% p.a. on her investment for the next 'n' number of years". The same objective can also be expressed as "to generate 5% p.a. more than the return on NIFTY 50 each year on the investment for the next 'n' number of years".

An investor needs to bear in mind that risk and return typically have a positive relationship. Higher the risk, higher would be the associated return. On the other hand, liquidity has an inverse relationship with return (when expressed as a discount rate). Higher the liquidity, lower would be discount, and vice versa. It operates like this, when an asset can be sold and bought in the market readily and very easily without much price discount, then the difference between the quoted price to sell and the actual realised price when the trade is complete would be minimal.

Generally, investors invest for preservation of capital, regular income, and capital appreciation. Sometimes investors also choose investments to save taxes, however it may be noted that tax saving is not appreciated as the sole motto of investment. The investment objectives lead to asset allocation decision. If the investment objective is capital appreciation,

then investments need to be high return investments (like equity). Of course, these investments will have higher risk than government securities or bank fixed deposits. On the other hand, if capital preservation is the primary investment objective, asset allocation will be tilted towards safe bonds and debt securities. If regular income is the investment objective, funds will be invested in asset classes generating periodical income like dividend paying stocks, interest paying bond or/and rent paying realty.

9.3.5. Investment Constraints

Constraints are limitations on investors to take exposure to certain investment opportunities. Constraints relates to investors liquidity needs, time horizon, and other unique needs and preferences.

Liquidity constraint

Different investors have different liquidity requirements. Younger people usually have lesser liquidity requirements than older people. Some may have some health or medical concerns which require them to maintain certain liquid funds. Others may have requirements of college fees or wedding in the family or some other needs. Generally investors prefer to have liquid funds to meet their day to day expenses. Additionally they may like to keep some amount of liquidity to meet contingency requirements like sudden medical expenses etc..
The needs for liquidity fall into following categories:

Emergency Cash: The emergency cash reserve is usually measured as two to three months' spending, but it could be more if the individual's source of income is at risk or volatile.

Near term goal. These needs vary with the individual. For known goals due within a year, the amount needed to achieve these goals should be in assets with relatively good liquidity.

Investment Flexibility. The ability to take advantage of market opportunities as asset classes become overvalued and undervalued would require greater degree of liquidity.

To meet such requirements, some portion of the portfolio should be in cash or cash like securities. The advisor or the manager needs to make detailed assessment of the liquidity needs of the investors. Keeping too much money for liquidity may hit the overall portfolio return. On the other hand, not maintaining sufficient liquidity will lead to inconvenience and selling of other investments untimely. The liquidity constraints of the investor need to be clearly specified in the IPS.

Regulatory constraints

Generally individual investors do not have many regulatory constraints. But if there are any, they need to be followed. Regulations can also constraint the investment choices available to the investors. For example, as per the Reserve Bank of India's notification, Liberalised Remittance Scheme (LRS), an Indian resident individual can only invest up to $250,000 overseas per year.[44] Indian resident individual investors cannot make investments greater than the amount specified by the regulator. Another example is the sale or purchase of securities on the basis of information that is not publicly known. Usually people who have access to such information are insiders of the company and they are prohibited from trading on the basis of insider information.

Tax Constraint

Investment process is complicated by tax concerns. Tax plays a very important role in portfolio management and drives investment decisions. Different investments and different kinds of income are taxed differently. Return in form of income like interest, dividend and rents versus return in form of capital appreciation are taxed differently. The same form of return may attract different tax liability depending on the tax bracket, the recipient belongs to. Hence a thorough understanding of the tax code applicable to the investor needs to be part of the IPS.

Exposures limits to different Sectors, Entities and Asset Classes

As per the SEBI PMS Regulations 2020 the agreement between the portfolio manager and the investor should include the investment approach. An investment approach is a broad outlay of the type of securities and permissible instruments to be invested in by the portfolio manager for the investor, taking into account factors specific to investor and securities. It should also include the type of instruments and proportion of exposure.

After taking into account the investor's objective, risk appetite, liquidity needs, tax and other regulatory constraints, time horizon for investment, exposure limits to specific sectors, entities and asset classes can be set to avoid "concentration risk". The portfolio manager needs to adhere to these exposure limits while managing investments.

[44] Under the Liberalised Remittance Scheme, all resident individuals, including minors, are allowed to freely remit up to USD 2,50,000 per financial year (April – March) for any permissible current or capital account transaction or a combination of both. Further, resident individuals can avail of foreign exchange facility for the purposes mentioned in Para 1 of Schedule III of FEM (CAT) Amendment Rules 2015, dated May 26, 2015, within the limit of USD 2,50,000 only. The Scheme was introduced on February 4, 2004, with a limit of USD 25,000. The LRS limit has been revised in stages consistent with prevailing macro and micro economic conditions

Unique needs and preferences

Sometimes investors have idiosyncratic concerns. They may have personal, social, ethical, cultural and preferences beliefs. For example an investor, may not want her money to be invested in the stocks of companies selling environmentally harmful products. Another example could be of an investor owning stocks of company in which he/she is working and is reluctant to sell the same even when it is financially prudent, due to emotional attachment. The point is that each investor is unique and if he/she has any specific preference, the same should be clearly specified in the IPS.

In addition to the above mentioned section, the IPS may also include reporting requirements, portfolio rebalancing schedules, frequency of performance communication, investment strategy and styles etc.

9.3.6. Assessments of needs and requirements of investor

Investors invest to meet their various goals and objectives. Assessment of the needs and requirements of the investors is critical in making investment decisions. People have many financial goals, some are to be achieved in near term, some are medium or long term goals. The goals also have different priority – some are high priority goals where as others may not be very important to achieve. Investors can put their needs and goals down along with the priority and the time frame for each of those goals, with the funds needed for the same. A proforma for creating a goal sheet is shown in Exhibit 9.1.

Exhibit 9.1: Proforma Goal Sheet

No.	Goal	Priority	Time period	Amount needed

Near-Term High Priority Goals have a high emotional priority which the investor wishes to achieve within just a few years at most. As a result, investment vehicles for these goals tend to be either cash equivalents or fixed-income instruments with maturity dates that match the goal date. For people of limited to modest means, the cost of not achieving those goals is just too great to take a risk with more-volatile approaches.

For many investors building a retirement corpus is a **long-term high priority goal**. When investors start planning for this goal well in advance, they have enough time to accumulate the corpus. Because of the long-term nature of such goals, a diversified approach utilizing several different classes of assets is usually preferred.

People also have many **low priority goals**. There are goals that are not particularly painful if they are not achieved. These could range from buying a farm house to a luxury car. For these goals, more-aggressive investment approaches are usually taken.

9.3.7 Analysing the financial position of the investor

A convenient way to analyse the financial position is by constructing personal financial statements. This helps in organizing financial data in a systematic way. Personal financial statements include a statement of net worth-balance sheet and income-expense statements.

For calculating net worth, all the assets the investor owns, i.e. the house, the car, the investments in stocks, bonds & mutual fund, balance in the saving accounts, value of the jewels owned and the value of all other financial assets and real assets are to be recorded at the estimated market value. Then all the liabilities need to be subtracted from the assets . Liabilities may include the outstanding car loan amount, credit card loans, home loan and any other amount he owes like the personal loan, education loan etc.. The difference between the value of assets and the liability is net worth.

It is suggested that net worth is to be calculated periodically, at least once in a year. The next step is calculating whether the person's present income exceeds spending and by how much amount. This is the amount which would be available periodically for investment purposes. The income expenditure statement can be prepared on monthly basis.

9.3.8. Psychographic analysis of investor:

In investment process, investor's behavioural traits and personality characteristics also play an important role in setting investors risk profile.

Psychographic analysis of investor bridges the gap between standard finance which treats investors as rational human beings and behavioural finance which view them as normal human beings who have biases and make cognitive errors. In other words, psychographic analysis of investor recognizes investors as normal human beings who are susceptible to biased or irrational behaviour.

All investors have unique personalities. Though it is difficult to categorize the personalities because they all are human beings and they are so different; some basic classification system

has evolved after years of research. There are many frameworks available to perform psychographic analysis. For illustration purpose, given below is the framework given by Bailard, Biehl & Kaiser (BB&K).

Bailard, Biehl & Kaiser (BB&K) classifies investor personalities by focusing on two aspects: the level of confidence and the method of action. The first deals with how the investor approaches life in terms of career, wealth or money. The second element deals with whether investor is careful, methodical and analytical in the approach towards life. The two elements can be thought of as two "axis" of individual psychology: one axis is the confidence/anxiousness the other is carefulness/ impetuousness.

The different personality characteristics are shown through Exhibit 9.2

Exhibit 9.2: Investor Personality Characteristics



The Five Personalities

The upper-right corner of Exhibit 9.2 represents the **adventurer**-people who are willing to put it all in one major bet and "go for it" because they have confidence. As far as they are concerned, it is a carefully considered decision. They are confident as well as impetuous. In that quadrant, one typically will find entrepreneurial people, people who are willing to stick their necks out in their careers or in their money management strategies. They normally have their own ideas about investing. They are willing to take risks, and they normally do not go for the investment advisers. They prefer concentrating their bets.

The lower-right quadrant of the exhibit is the **Celebrity** quadrant. These people like to be where the action is. They are afraid of being left out. These investors will keep bringing up the latest hot topic, asking, "Should I be in this, or should I be in that?" They really do not have their own ideas about investments. These people normally go for investment advisers. However, they are the most difficult investors to deal with because of their own confused beliefs.

The I**ndividualist** is in the upper-left quadrant. These people have certain degree of confidence about them, but they are also careful, methodical, and analytical. Individualists like to do their own research and tend to avoid extreme volatility. They are often contrarian investors because they do sit back and think about where they want to go and which investments make good value sense.

The lower-left quadrant represents the **Guardian** personality. Typically as people get older and begin considering retirement, they approach this personality profile. Guardians are people who are cautiously trying to preserve their wealth. They are definitely not interested in volatility or excitement.

Finally, there are always people who are so well balanced that they cannot be placed in any specific quadrant, so they fall near the centre; this investor is called a **Straight-Arrow** investors. On average, this group of investors is a relatively balanced composite of each of the other four investor types, and by implication a group willing to be exposed to medium risk.

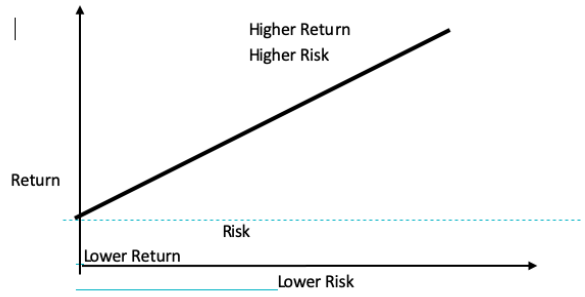
It is also worth noting that each investor at times exhibits some characteristics of personalities other than his normal one. This can be particularly influenced by his most recent investment experience. A guardian can become more aggressive for a time, like an adventurer, if he is on a winning streak. Conversely, most investors become more guardian like just after an event with heightened volatility.

Experience has shown that each of the five types of investors requires a different approach in portfolio management.

9.3.9. Life cycle analysis of investor

It is important to understand the various stages in the life cycle; because of the impact they have on an investor's risk appetite (Exhibit 9.3).

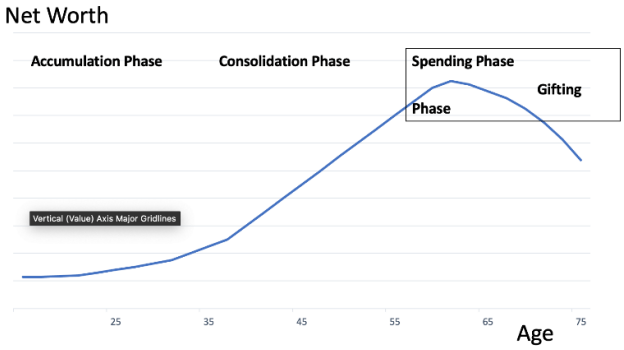
Exhibit 9.3: Risk/Return Trade-Offs for Investors



Every investor has thoughts about where she might be along that line, especially when the points are described in terms of risk and returns. Generally younger individuals who are just beginning to earn money tend to be on the right side of the line, while older individuals move

increasingly to the left side on the line. This life cycle of investing can be broken into phases: the accumulation, consolidation, spending, and gifting phases. This is depicted in Exhibit 9.4.

Exhibit 9.4: Lifecycle of investing



Accumulation Phase: During this phase, net worth is typically small relative to liabilities. Investments are fewer and typically non-diversified. Goals may include children's education, a house, and if possible, investments for future financial independence. Since the individual has a very long time horizon and a potentially growing income stream, she can undertake more high-return, high-risk capital gain-oriented investments.

Consolidation Phase: The consolidation or mid-to-late-career stage of the typical life cycle is characterized by the period when income exceeds expenses. As a result, this stage is characterized by the consolidation of investment portfolio. At this time, while the time horizon to retirement is still relatively long (15 or 20 years), investors may start looking for capital preservation. High capital gain investments are balanced with some lower-risk assets.

Spending Phase: This is the period when living expenses are covered not from earned income but from accumulated assets such as investments and retirement corpus. Because of the heavy reliance on investments in this phase and the unlikelihood of going back to work, the focus is on stability in investment portfolio. Preference will be on investment that generate dividend, interest, and rental income. As the investor's time horizon may still be well over 15 or 20 years, so some investments in the portfolio should continue to have growth and inflation-hedge potential.

Gifting Phase: This is the final phase when a person realizes that she has more assets than she will need for spending. In such cases the attitude about the purpose of investments does change. Investments at this stage may be made to leave legacy, support a charitable cause etc..

It is important to note that the boundaries between the stages are fuzzy on time scale.

9.3.10. Forecasting risk and return of various asset classes

Portfolio Management is the process of integrating two sets of information. The first set of required inputs have already been listed above viz., investment objectives, goals and requirements, personality type, phase in the life cycle, liquidity needs, tax and other constraints etc.. The second set of required inputs is the capital market forecasts that establishes the expected risk-return opportunities available to the investors as discussed in Chapter 3.

The various investment opportunities available to the investors need to be listed and their returns need to be forecasted along with the possibilities of deviations in those returns. Historical risk-return on various asset classes provide a good starting point to understand the relationship between risk and return and proceed to make the forecast about their future return possibilities.

9.3.11. Benchmarking the client's portfolio

The investment policy statement needs to provide a framework for evaluating the performance of the portfolio. It will typically include a benchmark portfolio which matches in composition of the investor's portfolio. The idea is to compare "apple with apple". If the investment is made in large cap equities, then the BSE 30 or NIFTY 50 index can be an appropriate benchmark. If the investment is made in long term bonds, a bond index with similar maturity and credit profile will be an appropriate benchmark.

Performance Benchmarking[45]

An investment approach (IA) is the documented investment philosophy to be adopted by the Portfolio Managers while managing the client funds in order to achieve client's investment objectives. Now, in addition to investment approach, an additional layer of broadly defined investment themes called 'strategies' shall be adopted by Portfolio Managers. These broad strategies shall be 'equity', 'debt', 'hybrid' and 'multi-asset'. Each investment approach (IA) shall be tagged to one and only one strategy from the strategies as above. This tagging shall be at the discretion of the concerned Portfolio Manager. A Portfolio Manager may tag more than one Investment strategy to an investment approach to a strategy but each investment approach must be tagged to only one strategy.

Association of Portfolio Managers of India (APMI) shall prescribe a maximum of three benchmarks for each strategy. These benchmarks shall reflect the crore philosophy of the Strategy. While tagging an investment approach to a particular strategy, the portfolio manager shall select one benchmark from those prescribed for that strategy to enable the investor to evaluate relative performance of the Portfolio Managers.

[45] https://www.sebi.gov.in/legal/circulars/dec-2022/performance-benchmarking-and-reporting-of-performance-by-portfolio-managers_66256.html

The Board of the Portfolio Managers shall be responsible for ensuring appropriate selection of Strategy and benchmark for each IA. Once an IA is tagged to a Strategy and/or to a benchmark, the tagging shall be changed only after offering an option to subscribers to the IA to exit without any exit load. The performance track record (of the specific IA whose tagging with Strategy/ benchmark was changed) prior to the change shall not be used by the Portfolio Manager for performance reporting. Further, the same shall be verified as part of annual audit under Regulation 30 of the SEBI (Portfolio Managers) Regulations, 2020 .

Once an IA is tagged to a Strategy and/or to a benchmark, the tagging shall be changed only after offering an option to subscribers to the IA to exit without any exit load. The performance track record (of the specific IA whose tagging with Strategy/ benchmark was changed) prior to the change shall not be used by the Portfolio Manager for performance reporting. Further, the same shall be verified as part of annual audit under Regulation 30 of the SEBI (Portfolio Managers) Regulations, 2020. The changes in Strategy and/ or benchmark shall be recorded with proper justification and shall be verified as part of the annual audit under the PM Regulations.

9.4 Asset allocation decision

The interaction between the two sets of information – about the investor and about the risk-return on investment opportunity culminates into asset allocation decision. The asset allocation decision follows logically from the investor's needs and goals, risk preferences and liquidity needs. After developing a forecast on risk and return on various asset classes, the portfolio manager has to decide the mix of assets that maximizes the after-tax returns for the investor.

9.5 Strategic versus Tactical Asset Allocation

The asset allocation decision which is made after taking into consideration investor's characteristics is Strategic Asset Allocation (SAA). It is the target policy portfolio. It provides target allocation among the major asset classes; in that sense it is essentially translation of an investment policy statement into asset weights. SAA is the long-term asset allocation decision. SAA is designed to meet the investors goals and objective over a longer period of time.

There is, however, a dynamic component to asset allocation – Tactical Asset Allocation (TAA). TAA is short-term asset allocation decision. These decision are taken more frequently than SAA. The idea behind TAA is to take the advantage of the opportunities in the financial markets.

When market conditions favour one asset class over other, the portfolio manager may temporarily shift money from one asset class to another to exploit discrepancy in market with a view to earn returns. In TAA, portfolio managers time markets, i.e., determine which asset classes are likely to go up more than expected and which less than expected. Then they will alter the target asset allocation accordingly. Thus, if a portfolio manager believes that the stock market is overvalued and is up for a correction, while debt market is undervalued, then it may reduce the proportion of the portfolio that is allocated to equities and increase the proportion allocated to debt.

After booking the gains, the portfolio needs to be rebalanced to pursue the target allocation.

Thus, TAA attempts to beat the markets. SAA decisions involve "time in the market" whereas TAA is for "timing the markets".

9.5.1. Importance of asset allocation decision–empirical support

Asset allocation is considered as the most important investment decision. This is because asset allocation is the major determinant of risk and return for a given portfolio. There is a huge empirical support for the same. Brinson, Hood, and Beebower (1986) in a landmark paper concluded that a portfolio's target asset allocation explained the majority of a broadly diversified portfolio's return variability over time. These findings were confirmed by Ibbotson, Roger G., and Paul D. Kaplan (2000) suggesting that a portfolio's investment policy is an important contributor to return variability.

Across all portfolios, asset allocation decision explains an average of 40 percent of the variation in fund returns. For a single fund, asset allocation explain 90 percent of the fund's variation in returns over time.

9.6 Rebalancing of Portfolio

Portfolio needs to be continuously monitored and periodically rebalanced. The need for rebalancing arises due to price changes in portfolio holdings. Over time, asset classes produce different returns that can change the portfolio's asset allocation. To keep the portfolio's original risk-and-return characteristics, the portfolio may require rebalancing. Portfolio may also require re-balancing due to changes in investor's goals and objectives, risk tolerance etc..

The IPS should include a policy regarding rebalancing the portfolio answering questions relating to rebalancing like "how often" and "how much" i.e. the periodicity for portfolio rebalancing and the tolerance for deviation from target policy portfolio.

9.6.1. Benefits and difficulties of rebalancing

Portfolio rebalancing involves a simple trade-off: the cost of rebalancing versus the cost of not rebalancing. While deciding the frequency of rebalancing, the trade-off between the cost of doing it and not doing it is to be arrived at. If investor's target asset allocation is considered optimal, any deviation from it due to price fluctuations is undesirable. However, rebalancing costs need to be borne in mind.

There are two types of cost – transaction cost and tax cost. Transaction costs is the time and money costs like research cost, brokerage etc., for buying and selling securities.

Relatively illiquid investments like private equity and real estate pose challenges in rebalancing as they pose higher transaction costs.

Rebalancing is comparatively easier with relatively more liquid asset like listed equities or government bonds. While rebalancing the portfolio, managers sell assets, usually the appreciated asset and buy usually depreciated assets. Portfolio managers often set price targets for buying and selling securities. Such actions attract tax liability, which also should be kept in mind while deciding the frequency for rebalancing and the tolerance for deviations.

Chapter 9: Sample Questions

1) The first step in the investment process is the development of _____.
   a. Objective statement.
   b. Investment Policy statement
   c. Financial statement.
   d. Statement of cash needs.

2) Which of the following is considered to be an investment objective?
   a. Capital preservation
   b. Capital appreciation
   c. Current income
   d. all of the above

3) Asset allocation is _____.
   a. The process of dividing funds into asset classes.
   b. Concerned with returns variability.
   c. Concerned with the risk associated with different assets.
   d. Concerned with the relationship among investments' returns.

4) _____ phase is the stage when investors in their early-to-middle earning years attempt to accumulate assets to satisfy near-term needs, e.g., children's education or down payment on a home.
   a. Accumulation
   b. Spending
   c. Gifting
   d. Consolidation

5) Which of the following is a step in the portfolio management process?
   a. Develop a policy statement.
   b. Study current financial and economic conditions.
   c. Construct the portfolio.
   d. All of the above

CHAPTER 10: TAXATION

LEARNING OBJECTIVES:

After reading this chapter, the reader should be familiar with:

- Taxation of investors
- Taxation of various streams of Income
- Section 9A of Income Tax Act, 1961

10.1 Taxation of investors

The provisions of Income-tax are contained in the Income-Tax Act, 1961 ('the ITA') which extends to the whole of India. The Income-Tax Act comprises of Chapters I to XXIII which include provisions relating to the determination of the residential status of a person in India, exemptions, computation of total income, deductions, determination of tax liability, filing of income tax return, the procedure for assessments, etc.

Section 2(31) of the ITA provides an inclusive definition of a person. It provides that a person includes:

a) an Individual;

b) a Hindu undivided family (HUF);

c) a Company;

d) a firm;

e) an Association of Person (AOP) or Body of Individual (BOI), whether incorporated or not;

f) Local authority and

g) every artificial juridical person, not falling within any of the above categories.

Persons referred under clause (e), (f) and (g) shall be deemed as a person even if it is not formed or established or incorporated with the object of deriving income, profits or gains.

10.1.1. Residential status

Income-tax liability of an assessee is calculated on basis of his 'Total Income'. What is to be included in the total income of assessee is greatly influenced by his residential status in India and his citizenship is of no consequence. For example, a person resident in India is liable to pay tax in India on his total world income. On the other hand, a person, who is a citizen of India but non-resident in India during the year, is liable to pay tax only on his Indian income. Total Income of an assessee cannot be computed unless his residential status is determined.

Hitherto, the residential status of an Individual was determined on the basis of his period of stay in India. However, with effect from Assessment Year 2021-22, the residential status of an Individual is determined on basis of his citizenship, period of stay in India and total income from Indian sources.

An assessee can be categorized into following residential status during the previous year:

a) Resident in India
b) Non-Resident in India

A resident individual and HUF are further sub-classified into the following status:

a) Resident and Ordinarily Resident
b) Resident but Not-ordinarily Resident

A new category of 'deemed resident' has been introduced in clause (1A) of Section 6 of the ITA with effect from Assessment Year 2021-22. As per Section 6(1A) of the ITA, an Indian citizen is deemed as resident in India irrespective of his stay in India if his total income, excluding income from foreign sources, [hereinafter referred to as 'Indian Income'] exceeds Rs. 15 lakhs during the previous year and he is not liable to tax in any other country or territory by reason of his domicile or residence or any other criteria of similar nature. Here, 'income from foreign sources' means income which accrues or arises outside India (except income derived from a business controlled in or a profession set up in India). Since it is a deeming fiction created by law without reference to stay in India, a deemed resident is always treated as Not-Ordinarily Resident.

10.1.1.1 Residential status of an Individual

The residential status of an Individual as inferred from provisions of Section 6 of the ITA can be categorised into the following categories:

1. Ordinary Resident in India
2. Resident But Not Ordinarily Resident in India

3. Deemed resident
4. Non-resident

An individual is treated as **resident in India** if he stays in India for:

(a) 182 days or more during the relevant previous year; or
(b) 60 days or more (but less than 182 days) during the relevant previous year and for 365 days or more in the last 4 years.

The condition (b) is not applicable in case of an Indian citizen or a person of Indian Origin in the following circumstances.

Exception 1: '60 days' to be replaced with '182 days' for the following categories:

a) Indian citizen or Person of Indian Origin, who being outside India, comes on a visit to India during the previous year and having his Indian income during the previous year of less than Rs 15 lakhs;

b) Indian citizen who leaves India during the previous year for the purpose of employment; or

c) Indian citizen who leaves India during the previous year as a member of the crew of an Indian Ship.

Exception 2: '60 days' to be replaced with '120 days' for the following categories:

a) Individual is an Indian Citizen or a Person of Indian Origin (PIO); and

b) His Indian income during the previous year exceeds Rs. 15 lakhs

The individual, in this situation, is deemed as Not Ordinarily Resident in India.

Deemed Resident

In view of Section 6(1A) of the ITA, an Indian Citizen is deemed as resident in India during the previous year if his Indian income during that year exceeds Rs. 15 lakh and he is not liable to pay tax in any other country or territory by reason of his domicile or residence or any other criteria of similar nature. Such individual is deemed as 'Not Ordinarily Resident' in India. These provisions are applicable notwithstanding the number of days of stay in India during the previous year.

As per clause (29A) in section 2 of the ITA, liable to tax in relation to a person, means that there is a liability of tax on such person under any law for the time being in force in any

country, and shall include a case where subsequent to imposition of tax liability, an exemption has been provided.

However, it is clarified that if an individual is said to be a resident in India, then the provisions of deemed residency will not apply in its case.

Not Ordinarily Resident
Where an individual is treated as resident in India, he will be treated as Not Ordinarily Resident (NOR) in India if he satisfies any one condition specified below:

a) He has been a non-resident in India for at least 9 out of 10 years immediately preceding the relevant previous year; or

b) He has been in India for 729 days or less during the period of 7 years immediately preceding the previous year.

c) He is an Indian Citizen or a Person of Indian Origin having Indian total income during the previous year exceeding Rs. 15 lakhs and present in India for a period of 120 days or more but less than 182 days during the previous year.

d) He is a citizen of India who is deemed to be a resident in India under Section 6(1A) of the ITA.

If he does not satisfy any of the above-mentioned conditions, he is treated as Ordinarily Resident (ROR) in India.

Non-resident
An individual is treated as non-resident in India if he does not satisfy any of the conditions required to be fulfilled to become a resident.

10.1.1.2 Residential Status of HUF

The residential status of a HUF depends upon its place of control and management and residential status of its manager.

Resident in India

A HUF is said to be resident in India in any previous year in every case except where during that year the control and management of its affairs are situated wholly outside India. If principal decision-makers of the HUF take even a single decision in India, the HUF will be considered a resident as 'part of its control and management' will be deemed to be situated in India.

Example, if regular accounts and reports of the foreign HUF are forwarded to the coparceners in India from time to time by the employees, instructions are sought from the coparcener regarding the conduct of the foreign business and such instructions are duly sent, these are substantial indications of the control and management situated in India.

Non-Resident

A HUF is deemed as a non-resident in India if during the previous year, the control and management of its affairs are situated wholly outside India.

Resident and Not-Ordinarily Resident

A resident HUF is further categorised into Not-Ordinarily Resident in India if any of the following conditions are satisfied:

1. The manager of the HUF has been a non-resident in India for at least 9 years out of 10 years preceding the previous year; or
2. The manager of the HUF has been in India for 729 days or less during the period of 7 years preceding the previous year.

If the above conditions are not satisfied, the HUF will be categorised as Ordinarily Resident in India.

10.1.1.3 Residential status of a company

Indian Company

An Indian Company means a company formed and registered under the Companies Act. Indian companies are always treated as resident in India. Even if an Indian company is a subsidiary of a foreign company or it is controlled from a place located outside India, the Indian company is considered as resident in India. An Indian company can never be a non-resident person.

Foreign Company

A foreign company is treated as resident in India if during the relevant previous year its Place of Effective Management is in India.

Residential Status of Firm or Association of Persons(AOP) or Body of Individuals(BOI) or Local Authority or Artificial Juridical Person

To determine the residential status of a firm or AOP or BOI or Local Authority or Artificial

Juridical Person, the residential status of partner or member during the previous year is not relevant.

A firm or AOP or BOI or Local Authority or Artificial Juridical Person is said to be resident in India in a previous year if any part of the control and management of its affairs is situated in India during that year. If principal decision-makers take even a single decision in India relating to the control and management of its affairs, the firm or AOP or BOI or Local Authority or Artificial Juridical Person will be considered a resident as 'part of its control and management' will be deemed to be situated in India. In other words, it is not necessary that substantial control and management should be situated or exercised in India.

A firm or AOP or BOI or Local Authority or Artificial Juridical Person is said to be non-resident in India in a previous year if the control and management of its affairs are situated wholly outside India during that year.

10.1.2. Place of Effective Management (POEM)

The Finance Act, 2015 amended the residency test for a company, wherein a company would be considered as resident in India if it is an Indian company, or if the company's POEM is in India during the relevant year. The POEM was defined as "a place where key management and commercial decisions that are necessary for the conduct of the business of an entity as a whole are, in substance made."

A foreign company is treated as resident in India if during the relevant previous year its Place of Effective Management is in India. For determination of Place of Effective Management, the Central Board of Direct Taxes (CBDT) has issued the guidelines in Circular No. 6/2017, dated January 24, 2017. These guidelines apply to a foreign company whose gross turnover or receipts during the year exceed Rs. 50 Crores.

10.1.3. Scope of total income

Scope of total income according to the residential status of an assessee shall be as under:

Resident and Ordinary Resident

A resident assessee shall be liable to pay tax in India on the following incomes:

a) Income received or is deemed to be received by him in India in the previous year;

b) Income accrues or arises or is deemed to accrue or arise to him in India during such year; and

c) Income accrues or arises to him outside India during such year.

Resident but not Ordinary Resident

A resident but not ordinarily resident individual and HUF shall be liable to pay tax in India on the following incomes:

a) Income received or is deemed to be received by him in India in the previous year;

b) Income accrues or arises or is deemed to accrue or arise to him in India during such year; and

c) Income accrues or arises to him outside India during such year if it is derived from a business controlled in India or a profession set up in India.

Non-Resident

In case of a non-resident assessee being an individual, HUF, firm, company or other person, following incomes shall be taxable in India:

a) Income received or is deemed to be received in India by such person in the previous year; and

b) Income accrues or arises or is deemed to accrue or arise to such person in India during such year.

Summary

Nature of income	**Resident and ordinarily resident**	**Resident but not ordinarily resident**	**Non-resident**
Income received or is deemed to be received in India	Taxable	Taxable	Taxable
Income accrues or arises or is deemed to accrue or arise to him in India	Taxable	Taxable	Taxable
Income accrues or arises outside India if it is derived from a business controlled in India or a profession set up in India	Taxable	Taxable	Not-taxable
Income accrues or arises outside India (from a business controlled from outside India or from a profession set up outside India)	Taxable	Not-taxable	Not-taxable

10.1.4 Characterisation of income

Gains arising from the transfer of securities held in the investee company or portfolio company may be treated either as 'Capital Gains' or as 'Business Income' for tax purposes, depending upon whether such securities were held as a capital asset or a trading asset (i.e., stock-in-trade).

Following are the key illustrative factors indicative of Capital Gains characterisation (not Business Income): -

(a) Intention at the time of acquisition - capital appreciation;
(b) Low transaction frequency;
(c) Long period of holding;
(d) Shown as investments in books of accounts (not stock in trade);
(e) Use of owned funds (as opposed to loan) for acquisition; and
(f) Main object in constitution document is to make investments.

Depending on the characterisation of income, the income and taxes would be computed accordingly.

10.2 Taxation of various streams of income

In the Income-tax Act, 1961, the income is computed under five heads of income, namely, salaries, income from house property, profits and gains of business or profession, capital gains and income from other sources. Total income is the aggregate of income computed under these heads. In case of PMS, the investor is investing in the underlying securities through the PMS, and not investing in the PMS per se. A PMS Client may earn:

- Income from dividend on shares and units of mutual funds
- Income from interest on Fixed Income Securities
- Short-term and/or long-term capital gains (or losses) on sale of Securities (shares, debentures, rights renunciations, units, etc.), if gains are categorized as capital gains
- Business Income (loss) from purchase and sale of Securities (shares, debentures, rights renunciations, units, etc.), if gains are categorized as business income

10.2.1 Capital Gains

The Income Tax Authority (ITA) provides for a specific mechanism for computation of capital gains. Capital gains are computed by deducting from the sale consideration, the cost of acquisition and certain other expenses. The tax payable on capital gains would depend on whether the capital gains are long-term or short-term in nature.

Depending on the period for which the securities are held, capital gains earned by the Investors would be treated as short term or long-term capital gains. The taxability of capital gains is discussed below:

Type of instrument	Period of holding	Characterisation
Listed Securities (other than a unit), units of equity-oriented mutual funds, units of Unit Trust of India and Zero-Coupon bonds	More than 12 months	Long-term Capital Asset
	12 months or less	Short-term Capital Asset
Shares of a company (other than shares listed on a recognised stock exchange)	More than 24 months	Long-term Capital Asset
	24 months or less	Short-term Capital Asset
Other securities (other than Market Linked Debentures and unit of a Specified Mutual Fund)	More than 24 months	Long-term Capital Asset
	24 months or less	Short-term Capital Asset

Capital gains on redemption/ transfer/ maturity of Specified Mutual Fund (i.e. a mutual fund where not more than 35% is invested in equity shares of an Indian company) acquired on or after 1 April 2023 or Market Linked Debentures shall be deemed to be capital gains arising from a Short-Term Capital Asset (STCG), irrespective of the period of holding.

CAPITAL GAINS TAXATION

	Individual/ HUF [$]	Domestic Company [@]	NRI [$]
Equity Oriented Schemes (minimum of 65 percent of the total proceeds of such fund is invested in the listed equity shares of domestic companies) • Long Term Capital Gains (units held for more than 12 months) • Short Term Capital Gains (units held for 12 months or less)			
Long term capital gains*	10% (12.5%)****	10% (12.5%)****	10% (12.5%)****
Short term capital gains	15% (20%)****	15% (20%)****	15% (20%)****
Other Than Equity Oriented Schemes • Long Term Capital Gains [units held for more than 36 months (24 months**)] • Short Term Capital Gains [units held for 36 months (24 months****) or less]**			
Long term capital gains (Not applicable for specified mutual fund schemes – Note 1)	20%[&] (12.5%)****	20%[&] (12.5%)****	Listed - 20%[&] (12.5%)**** Unlisted - 10%*** (12.5%)****
Short term capital gains - (Including specified mutual fund schemes – Note 1)	30%^	30%/25%^^/22%^^^/15%^^^^	30%^

Tax deductible at source under the Act (Applicable to NRI Investors) [#]		
	Short term capital gains [$]	**Long term capital gains[$]**
Equity oriented schemes	15% (20%)****	10%* (12.5%)****
Other than equity oriented schemes (except specified mutual fund schemes)	30%^	10%*** (for unlisted) (12.5%)**** [&] 20%[&] (12.5%)**** (for listed)
Specified mutual fund schemes - Note 1	30%^	Not applicable

Note 1 - Capital gains from transfer of units of "specified mutual fund schemes" acquired on or after 1st April 2023 are treated as short term capital gains taxable at applicable slab rates as provided above irrespective of the period of holding of such mutual fund units. For this purpose, "specified mutual fund" means mutual fund where not more than 35 per cent of its total proceeds is invested in the equity shares of domestic companies.The definition of the "specified mutual fund" is to be amended from FY 2025-26 as (a) Mutual fund which invests more than 65 per cent of its total proceeds in debt and money market instruments; or (b) a fund which invests 65 per cent or more of its total proceeds in units of a fund referred to in above sub-clause (a)

* Income-tax at the rate of 10%/12.5% (without indexation benefit and foreign exchange fluctuation) to be levied on long-term capital gains exceeding Rs. 1.25 lakh provided transfer of such units is subject to Securities Transaction Tax ('STT').

$ Surcharge to be levied at:
- 37% on base tax where specified income** exceeds Rs. 5 crore;
- 25% where specified income** exceeds Rs. 2 crore but does not exceed Rs. 5 crore;
- 15% where total income exceeds Rs. 1 crore but does not exceed Rs. 2 crore; and
- 10% where total income exceeds Rs. 50 lakhs but does not exceed Rs. 1 crore.

In case total income includes income by way of dividend on shares and short-term capital gains on units of equity oriented mutual fund schemes and long-term capital gains on mutual fund schemes, the rate of surcharge on the said type of income not to exceed 15%. In case investor is opting for 'New Regime' as mentioned on page 3, the rate of surcharge not to exceed 25%.

** Specified income – Total income excluding income by way of dividend on shares and short-term capital gains on units of equity oriented mutual fund schemes and long-term capital gains on mutual fund schemes.
Further, Health and Education Cess to be levied at the rate of 4% on aggregate of base tax and surcharge.

**** For gains on transfer/redemption on or after 23 July 2024. For determining nature of gains (i.e. long term or short term) on mutual fund unit listed on recognized stock exchange in India, period of holding of 12 months is to be considered.

@ Surcharge at 7% on base tax is applicable where total income of domestic corporate unit holders exceeds Rs 1 crore but does not exceed 10 crores and at 12% where total income exceeds 10 crores. However, surcharge at flat rate of 10 percent to be levied on base tax for the companies opting for lower rate of tax of 22%/15%. Further, "Health and Education Cess" to be levied at the rate of 4% on aggregate of base tax and surcharge.

Short term/ long term capital gain tax (along with applicable Surcharge and Health and Education Cess) will be deducted at the time of redemption of units in case of NRI investors. Tax treaty benefit can be claimed for withholding tax on capital gains subject to fulfillment of stipulated conditions.

& After providing indexation.

*** Without indexation.

^ Assuming the investor falls into highest tax bracket.

^^ If total turnover or gross receipts in the financial year 2022-23 does not exceed Rs. 400 crores.

^^^ This lower rate is optional and subject to fulfillment of certain conditions as provided in section 115BAA.

^^^^ This lower rate is optional for companies engaged in manufacturing business (set-up & registered on or after 1 October 2019) subject to fulfillment of certain conditions as provided in section 115BAB

10.2.2 Dividend income

As per section 115-O of the ITA, the Indian company declaring dividend would not be required to pay any dividend distribution tax on dividend distributed/paid/declared to its shareholders. The dividend income would be taxable in the hands of the shareholders under the ITA at applicable rates. Further, the shareholder can claim a deduction of interest expenditure incurred for the purpose of earning such dividend income and such deduction would be restricted to 20% of the gross dividend income.

Further, as per section 80M of the ITA, any Indian company which receives dividend from another Indian company and the dividend is distributed by the first mentioned Indian company to its shareholders before the specified due date (i.e., one month prior to the date of filing tax return under section 139 of the ITA), then the first mentioned Indian company can claim a deduction of the dividend received by it from the other Indian company.

The Indian Company declaring dividend would be required to deduct tax at 10% in case of payment to resident investors (provided amount exceeds INR 10,000) and at 20% or rates in force, in case of payment to non-resident investors. In case, the dividend income is paid to FPIs, the rate of tax deduction at source as per section 196D of the ITA is 20% (plus applicable surcharge and cess), unless a lower rate is specified in the relevant tax treaty.

Accordingly, the dividend income (net of deductions, if any) will be taxable at the following rates:

Resident investors

Dividend income earned by	Tax rate for domestic investors
Resident companies (Refer Note 1 and 2)	30%
Firms / Limited Liability Partnerships (LLPs)	30%
Others (Refer Note 3)	As per applicable slab rates, maximum being 30%

Note 1: In case of domestic companies having total turnover or gross receipts not exceeding INR 400 crores in the Financial Year 2022-23 (Assessment Year 2023-24), the applicable tax rate would be 25%.

Note 2: The tax rates for domestic companies exercising the option under section 115BAA and section 115BAB of the ITA shall be 22% and 15% respectively, subject to fulfilment of conditions prescribed in the said sections.

Note 3: The rates provided under section 115BAC(1A) of the ITA shall be applicable unless an option is exercised under section 115BAC(6) to opt out of the regime. Further, the option of opting back to the regime under section 115BAC(1A) of the ITA can be exercised only once by a taxpayer earning income from business or profession. However, a person not having income from business or profession shall be able to exercise this option every year. Under this regime, the rate of surcharge shall be capped at 25% (instead of 37%). This section is also applicable to association of persons [other than a cooperative society], or body of individuals, whether incorporated or not, or an artificial juridical person. At present, the highest slab rate has been captured.

10.2.3 Interest income on debt securities

Resident investors

Interest income earned by	Tax rate for domestic investors
Resident companies (Refer Note 1 and 2)	30%
Firms / LLPs[46]	30%
Others (Refer Note 3)	As per applicable slab rates, maximum being 30%

Note 1: In case of domestic companies having total turnover or gross receipts not exceeding INR 400 crores in the Financial Year 2022-23 (Assessment Year 2023-24), the applicable tax rate would be 25%.

Note 2: Further, the tax rates for domestic companies exercising the option under section 115BAA and section 115BAB of the ITA shall be 22% and 15% respectively, subject to fulfilment of conditions prescribed in the said sections.

Note 3: The rates provided under section 115BAC(1A) of the ITA shall be applicable unless an option is exercised under section 115BAC(6) to opt out of the regime. Further, the option of opting back to the regime under section 115BAC(1A) of the ITA can be exercised only once by a taxpayer earning income from business or profession. However, a person not having income from business or profession shall be able to exercise this option every year. Under this regime, the rate of surcharge shall be capped at 25% (instead of 37%). This section is also applicable to association of persons [other than a cooperative society],

[46] Limited Liability Partnerships

or body of individuals, whether incorporated or not, or an artificial juridical person. At present, the highest slab rate has been captured.

Non-resident investors

As per the provisions of the ITA, in case of taxability of non-resident who is a tax resident of a country with which India has a tax treaty for granting relief of tax, the provisions of the ITA shall apply to the extent they are more beneficial.

The interest income earned by the non-resident investors (being corporate entity/ non-corporate entity) shall be generally (unless certain conditions are satisfied) taxable at the rate of 40%/ as per slab under the provisions of the ITA.

10.2.4 Gains are characterised as 'business income'

If the gains are characterised as business income, then the same should be taxable on net income basis at the rate of 30% for resident investors. In case of domestic companies having total turnover or gross receipts not exceeding INR 400 crores in the Financial Year 2022-23 (Assessment Year 2023-24), the applicable tax rate would be 25%. Kindly note, we have assumed highest rate for resident individual investors. Further, the tax rates for domestic companies exercising the option under section 115BAA and section 115BAB of the ITA shall be 22% and 15% respectively, subject to fulfilment of conditions prescribed in the said sections.

If the gains are characterised as business income, then the same should be taxable on net income basis at 40% for foreign company if it has a business connection/ permanent establishment in India, and such income is attributable to the business connection/ permanent establishment of the non-resident in India. Further, for non-resident investors (other than a foreign company) a tax rate of 30% should be levied.

Proceeds on buy-back of shares by a domestic company

Gains arising on buy back of shares (listed and unlisted) shall be exempt in the hands of investors. However, a distribution tax at the rate of 20% (plus applicable surcharge of 12% and health and education cess of 4%) shall be payable by the Indian company on distribution of income by way of buyback of its shares if the buy-back is in accordance with the provisions of any law for the time being in force relating to companies. Such distribution tax shall be payable on the difference between consideration paid by such Indian company for purchase of its own shares and the amount that was received by the Indian company at the time of issue of such shares.

Amount received on buyback of shares (undertaken in accordance with provisions of section 68 of the Companies Act 2013) shall be taxable as dividend in the hands of the shareholder as per section 2(22)(f) of the ITA with effect from 01 October 2024. Further, no deduction for expenses shall be available against such deemed dividend income (i.e., on account of buy-back of shares) under section 57 of the ITA.

Further, section 46A of the ITA is also amended to provide that the sale consideration of such shares bought back shall be considered as nil and cost of acquisition of such shares bought back shall be treated as capital loss. The said loss shall be available for set-off and carry forward purposes in accordance with the provisions of the ITA.

10.3 Section 9A of ITA

SEBI (Portfolio Managers) Regulations, 2020 provides for an enabling framework for fund managers desirous of providing their services to overseas funds. In the Union Budget 2015-16, the Finance Minister announced amendments in the ITA. These changes were aimed at developing and promoting fund management industry in India. Section 9A was inserted in the ITA to provide a 'safe harbour' to overseas funds availing fund management services from India based managers, provided the fund and the manager comply with the requirements specified in the section.

Section 9A of the ITA provides that in case an eligible investment fund, established or incorporated or registered outside India, collects funds from its members and invests in India then such fund shall not be deemed to have a business connection nor will be regarded as resident in India just because fund management activity is carried out through a eligible fund manager located in India. However, this provision shall apply only when investment fund, as well as fund manager, comply with the conditions as prescribed under section 9A of the ITA.

The conditions which an eligible investment fund has to comply with are as follows:

a. the fund is not a person resident in India;
b. the fund is a resident of such country with which India has a tax treaty or the investment fund is established or incorporated in a specified country notified by the Central Government;
c. the aggregate participation or investment in the fund by person resident in India shall not exceed 5% of the corpus fund. However, for the purpose of calculation of said aggregate participation or investment in the fund, any contribution made by eligible fund manager during the first three years of the operation of the fund, not exceeding INR 25 crore, shall not be taken into account;
d. the fund and its activities are subject to applicable investor protection regulations in the country or specified territory where it is established or incorporated or is a resident;

e. the fund should have a minimum of 25 members who are, directly or indirectly, not connected persons;
f. Any member of the fund along with connected persons shall not have any participation interest, directly or indirectly, in the fund exceeding 10%;
g. The aggregate participation interest, directly or indirectly, of 10 or less members along with their connected persons in the fund, shall be less than 50%.
h. The fund shall not invest more than twenty per cent of its corpus in any entity
i. the fund shall not make any investment in its associate entity;
j. the monthly average of the corpus of the fund shall not be less than INR 100 crore. However, in case the fund is established or incorporated in the previous year then the corpus of fund shall not be less than INR 100 crore at the end of period of 12 months from the last day of the month in which the fund was established or incorporated;
k. the fund shall not carry on or control and manage, directly or indirectly, any business in India;
l. the fund is neither engaged in any activity which constitutes a business connection in India nor has any person acting on its behalf whose activities constitute a business connection in India other than the activities undertaken by the eligible fund manager on its behalf;
m. the remuneration paid by the fund to an eligible fund manager in respect of fund management activity undertaken by him on its behalf is not less than the amount calculated in the prescribed manner.

The conditions specified in (e), (f) and (g) above shall not apply in case of an investment fund set up by the Government or the Central Bank of a foreign State or a sovereign fund or Category I Foreign Portfolio Investor (FPI) registered under SEBI (FPI) Regulations, 2019.

The conditions which eligible fund manager has to comply with are as follows:

(a) the person is not an employee of the eligible investment fund or a connected person of the fund;
(b) the person is registered as a fund manager or an investment advisor in accordance with the either SEBI (Portfolio Managers) Regulations, 2020, SEBI (Investment Advisers) Regulations, 2013 or SEBI (Mutual Fund) Regulations, 1996;
(c) the person is acting in the ordinary course of his business as a fund manager;
(d) the person along with his connected persons shall not be entitled, directly or indirectly, to more than 20% of the profits accruing or arising to the eligible investment fund from the transactions carried out by the fund through the fund manager.

Chapter 10: Sample Questions

1. **Commission received from business forms part of income from_____.**
   - **a. Business and profession**
   - b. Capital Gains
   - c. Salary
   - d. Other sources

2. **For a person to be qualified as a NRI, he must have stayed outside India for more than _____days in a previous financial year.**
   - a. 365
   - b. 280
   - **c. 182**
   - d. 150

CHAPTER 11: REGULATORY, GOVERNANCE AND ETHICAL ASPECTS OF PORTFOLIO MANAGERS

LEARNING OBJECTIVES:

After studying this chapter, the candidates should know about:

- Prevention of Money Laundering Act, 2002
- SEBI (Prohibition of Insider Trading) Regulation 2015
- SEBI (Prohibition of Fraudulent and Unfair Trade Practices Relating to Securities Market) Regulations, 2003
- SEBI (Portfolio Managers) Regulations, 2020
- Best practices for Portfolio Managers

11.1 Prevention of Money Laundering Act, 2002

The Prevention of Money Laundering Act, 2002 (PMLA) forms the core of the legal framework put in place in India to combat money laundering. The provisions of PMLA came into force on July 1 2005. The objective of PMLA is, "to prevent money-laundering and to provide for confiscation of property derived from, or involved in, money-laundering and for matters connected therewith or incidental thereto."

Provisions of the PMLA stipulate that every banking company, financial institution and intermediary shall maintain a record of all transactions, the nature and value of which may be prescribed, whether such transactions comprise a single transaction or a series of transactions integrally connected to each other, and where such series of transactions take place within a month and furnish information of transactions and verify and maintain the records of the identity of all its clients. Such transactions include:

- All cash transactions of the value of more than Rs. 10 lakh or its equivalent in foreign currency.
- All series of cash transactions integrally connected to each other which have been valued below Rs. 10 lakh or its equivalent in foreign currency where such series of transactions take place within one calendar month and the aggregate value of such transaction exceeds Rs. 10 lakh.
- All suspicious transaction whether or not made in cash. For the purpose of suspicious transactions apart from 'transactions integrally connected', 'transactions remotely connected or related' shall also be considered.

The records which have been referred to in the above paragraphs have to be maintained for a period of 10 years from the date of cessation of the transactions between the clients and the banking company or financial institution or intermediary, as the case may be.

Section 3 of the PMLA 2002, defines offence of money laundering as:

"Whosoever directly or indirectly attempts to indulge or knowingly assists or knowingly is a party or is actually involved in any process or activity connected with the proceeds of crime including its concealment, possession, acquisition or use and projecting and claiming it as untainted property shall be guilty of offence of money laundering."

Any person found indulging in any offence of money laundering as defined in section 3 of the PMLA, shall be punished as per provisions mentioned in section 4 of the Act.

The Obligations on banking companies, financial institutions and intermediaries has been specified in Section 12 of the PMLA 2002:

1. Every reporting entity shall –
    a. maintain a record of all transactions, including information relating to transactions covered under clause (b) in such manner as to enable it to reconstruct individual transactions. This records shall be maintained for a period of five years from the date of transaction between a client and the reporting entity.
    b. furnish to the Director within such time as may be prescribed, information relating to such transactions, whether attempted or executed the nature and value of which may be prescribed.
    c. maintain record of documents evidencing identity of its clients and beneficial owners as well as account files and business correspondence relating to its clients. This records shall be maintained for a period of five years after the business relationship between a client and the reporting entity has ended or the account has been closed whichever is later.

2. Every information maintained, furnished or verified, save as otherwise provided under any law for the time being in force, shall be kept confidential.

Section 12 AA of PMLA stipulates enhanced due diligence by reporting entities. The details are given below:

1. Every reporting entity shall, prior to the commencement of each specified transaction:

(a) verify the identity of the clients undertaking such specified transaction by authentication under the Aadhaar (Targeted Delivery of Financial and Other Subsidies, Benefits and Services) Act, 2016 (18 of 2016) in such manner and subject to such conditions, as may be prescribed, provided that where verification requires authentication of a person who is not entitled to obtain an Aadhaar number under the provisions of the said Act, verification to authenticate

the identity of the client undertaking such specified transaction shall be carried out by such other process or mode, as may be prescribed.

(b) take additional steps to examine the ownership and financial position, including sources of funds of the client, in such manner as may be prescribed.

(c) take additional steps as may be prescribed to record the purpose behind conducting the specified transaction and the intended nature of the relationship between the transaction parties.

The information obtained while applying the enhanced due diligence measures shall be maintained for a period of five years from the date of transaction between a client and the reporting entity.

(2) Where the client fails to fulfil the above conditions, the reporting entity shall not allow the specified transaction to be carried out. Specified transaction means:

- any withdrawal or deposit in cash, exceeding such amount;
- any transaction in foreign exchange, exceeding such amount;
- any transaction in any high value imports or remittances;
- such other transaction or class of transactions, in the interest of revenue or where there is a high risk of money-laundering or terrorist financing, as may be prescribed.

(3) Where any specified transaction or series of specified transactions undertaken by a client is considered suspicious or likely to involve proceeds of crime, the reporting entity shall increase the future monitoring of the business relationship with the client, including greater scrutiny or transactions in such manner as may be prescribed.

As per provisions of PMLA, intermediaries registered under SEBI Act, shall have to adhere to the provisions as given in the PMLA. A 'Principal Officer' needs to be designated who shall be responsible for ensuring compliance of the provisions of the PMLA. SEBI has issued necessary directives vide circulars from time to time, covering issues related to Know Your Client (KYC) norms, Anti-Money Laundering (AML), Client Due Diligence (CDD). These directives lay down minimum requirements and it is emphasised that the intermediaries may, according to their requirements specify additional disclosures to be made by the clients to address the concerns of money laundering and suspicious transactions undertaken by the clients.

11.2 SEBI (Prohibition of Insider Trading) Regulations 2015[47]

Any dealing/trading done by an insider based on information which is not available in public domain, gives an undue advantage to insiders and affects market integrity. This is not in line with the principle of fair and equitable markets. In order to protect integrity of the market, the SEBI (Prohibition of Insider Trading) Regulations have been put in place.

Schedule C of the regulation specifies the minimum standards for code of conduct for intermediaries and fiduciaries to regulate, monitor and report trading by Designated Persons. The details are given below:

1. The compliance officer shall report to the board of directors or head(s) of the organisation (or committee constituted in this regard) and in particular, shall provide reports to the Chairman of the Audit Committee or other analogous body, if any, or to the Chairman of the board of directors or head(s) of the organisation at such frequency as may be stipulated by the board of directors or head(s) of the organization but not less than once in a year.
2. All information shall be handled within the organisation on a need-to-know basis and no unpublished price sensitive information shall be communicated to any person except in furtherance of legitimate purposes, performance of duties or discharge of legal obligations. The code of conduct shall contain norms for appropriate Chinese Wall procedures, and processes for permitting any designated person to "cross the wall".
3. Designated persons and immediate relatives of designated persons in the organisation shall be governed by an internal code of conduct governing dealing in securities.
4. Designated persons may execute trades subject to compliance with these regulations. Trading by designated persons shall be subject to pre-clearance by the compliance officer(s), if the value of the proposed trades is above such thresholds as the board of directors or head(s) of the organisation may stipulate.
5. The compliance officer shall confidentially maintain a list of such securities as a "restricted list" which shall be used as the basis for approving or rejecting applications for pre-clearance of trades.
6. Prior to approving any trades, the compliance officer shall seek declarations to the effect that the applicant for pre-clearance is not in possession of any unpublished price sensitive information. He shall also have regard to whether any such declaration is reasonably capable of being rendered inaccurate.
7. The code of conduct shall specify any reasonable timeframe, which in any event shall not be more than seven trading days, within which trades that have been pre-cleared have to be executed by the designated person, failing which fresh pre-clearance would be needed for the trades to be executed.
8. The code of conduct shall specify the period, which in any event shall not be less than six months, within which a designated person who is a connected person of the listed company

[47] "the Board" refers to SEBI and Act refers to the SEBI Act.

and is permitted to trade in the securities of such listed company, shall not execute a contra trade. The compliance officer may be empowered to grant relaxation from strict application of such restriction for reasons to be recorded in writing provided that such relaxation does not violate these regulations. Should a contra trade be executed, inadvertently or otherwise, in violation of such a restriction, the profits from such trade shall be liable to be disgorged for remittance to the Board for credit to the Investor Protection and Education Fund administered by the Board under the Act.

Provided that this shall not be applicable for trades pursuant to exercise of stock options.

9. The code of conduct shall stipulate such formats as the board of directors or head(s) of the organisation (or committee constituted in this regard) deems necessary for making applications for pre-clearance, reporting of trades executed, reporting of decisions not to trade after securing pre-clearance, and for reporting level of holdings in securities at such intervals as may be determined as being necessary to monitor compliance with these regulations.

10. Without prejudice to the power of the Board under the Act, the code of conduct shall stipulate the sanctions and disciplinary actions, including wage freeze, suspension, recovery, clawback etc., that may be imposed, by the intermediary or fiduciary required to formulate a code of conduct under sub-regulation (1) and sub-regulation (2) of regulation 9, for the contravention of the code of conduct. Any amount collected under this clause shall be remitted to SEBI for credit to the Investor Protection and Education Fund administered by SEBI under the SEBI Act.

11. The code of conduct shall specify that in case it is observed by the intermediary or fiduciary required to formulate a code of conduct under sub-regulation (1) or sub-regulation (2) of regulation 9, respectively, that there has been a violation of these regulations, such intermediary or fiduciary shall promptly inform the stock exchange where the concerned securities are traded, in such form and such manner as may be specified by SEBI from time to time.

12. All designated persons shall be required to disclose name and Permanent Account Number or any other identifier authorized by law of the following to the intermediary or fiduciary on an annual basis and as and when the information changes:

a) immediate relatives

b) persons with whom such designated person(s) shares a material financial relationship

c) Phone, mobile, and cell numbers which are used by them

In addition, names of educational institutions from which designated persons have graduated and names of their past employers shall also be disclosed on a one time basis.

Explanation – the term “material financial relationship” shall mean a relationship in which one person is a recipient of any kind of payment such as by way of a loan or gift from a designated person during the immediately preceding twelve months, equivalent to at least

25% of the annual income of such designated person but shall exclude relationships in which the payment is based on arm's length transactions.
13. Intermediaries and fiduciaries shall have a process for how and when people are brought 'inside' on sensitive transactions. Individuals should be made aware of the duties and responsibilities attached to the receipt of Inside Information, and the liability that attaches to misuse or unwarranted use of such information.

11.3 SEBI (Prohibition of Fraudulent and Unfair Trade Practices Relating to Securities Market) Regulations, 2003

SEBI (Prohibition of Fraudulent and Unfair Trade Practices relating to Securities Market) Regulations, 2003 prohibits fraudulent, unfair and manipulative trade practices in securities.

Regulation 2(1)(c) defines fraud as inclusive of any act, expression, omission or concealment committed to induce another person or his agent to deal in securities.

Chapter II of the regulations prohibits certain dealings in securities covering buying, selling or issuance of securities. The regulations prohibit a person to, directly or indirectly:

- buy, sell or deal in securities in a fraudulent manner.
- use or employ in connection with issue, purchase or sale of any security listed or proposed to be listed, any manipulative or deceptive device or contrivance in contravention of the provisions of SEBI Act or rules or regulations made thereunder.
- employ any device, scheme or artifice to defraud in connection with dealing in or issue of any security listed or proposed to be listed.
- engage in any act, practice, course of business which would operate as a fraud or deceit in connection with any dealing in or issue of securities, which are listed or proposed to be listed.
- indulge in a fraudulent or an unfair trade practices in securities.

Dealing in securities shall be deemed to be a manipulative, fraudulent or an unfair trade practice if it involves any of the following:

a) knowingly indulging in an act which creates false or misleading appearance of trading in the securities market;
b) dealing in a security not intended to effect transfer of beneficial ownership but intended to operate only as a device to inflate, depress or cause fluctuations in the price of such security for wrongful gain or avoidance of loss;
c) inducing any person to subscribe to an issue of the securities for fraudulently securing the minimum subscription to such issue of securities, by advancing or agreeing to advance any money to any other person or through any other means;

d) inducing any person for dealing in any securities for artificially inflating, depressing, maintaining or causing fluctuation in the price of securities through any means including by paying, offering or agreeing to pay or offer any money or money's worth, directly or indirectly, to any person;
e) any act or omission amounting to manipulation of the price of a security including, influencing or manipulating the reference price or bench mark price of any securities;
f) knowingly publishing or causing to publish or reporting or causing to report by a person dealing in securities any information relating to securities, including financial results, financial statements, mergers and acquisitions, regulatory approvals, which is not true or which he does not believe to be true prior to or in the course of dealing in securities;
g) entering into a transaction in securities without intention of performing it or without intention of change of ownership of such security; selling, dealing or pledging of stolen, counterfeit or fraudulently issued securities whether in physical or dematerialized form.

11.4 SEBI (Portfolio Managers) Regulations, 2020

The following section gives a summary of the SEBI (Portfolio Managers) Regulations, 2020**.** Major parts of the regulation have been covered in the previous chapters as and where required.

As per the Regulation:

Portfolio means the total holdings of securities and goods belonging to any person;

Principal officer means an employee of the portfolio manager who has been designated as such by the portfolio manager and is responsible for (i) the decisions made by the portfolio manager for the management or administration of portfolio of securities or the funds of the client, as the case may be; and (ii) all other operations of the portfolio manager.

Registration as Portfolio Manager
No person shall act as portfolio manager unless he holds a certificate granted by SEBI under SEBI PMS Regulations.

Conditions of registration

The certificate of registration granted under Portfolio Managers Regulations is subject to the following conditions, namely: -

i. the portfolio manager shall abide by the provisions of the SEBI Act and SEBI Portfolio Managers regulations;
ii. the portfolio manager shall obtain prior approval of SEBI in case of change in control in such manner as may be specified by SEBI.

(b) the portfolio manager shall forthwith inform SEBI in writing, if any information or particulars previously submitted to SEBI are found to be false or misleading in any material particular or if there is any material change in the information already submitted;

(c) the portfolio manager shall pay the fees for registration in the manner provided in SEBI PMS regulations;

(d) the portfolio manager shall take adequate steps for redressal of grievances of the investors within the time stipulated by SEBI and keep SEBI informed about the number, nature and other particulars of the complaints received;

(e) the portfolio manager shall maintain the net worth specified in PMS Regulations at all times during the period of the certificate. (This is not applicable in case of co-investment portfolio manager).

Management or administration of clients' portfolio

The money or securities accepted by the portfolio manager shall not be invested or managed by the portfolio manager except in terms of the agreement between the portfolio manager and the client. Any renewal of portfolio on maturity of the initial period shall be deemed as a fresh placement.[48]

Notwithstanding anything contained in the agreement as referred in the PMS regulation, the funds or securities can be withdrawn by the client before the maturity of the contract under the following circumstances, namely;
a) voluntary or compulsory termination of portfolio management services by the portfolio manager or the client;[49]
b) suspension or cancellation of the certificate of registration of the portfolio manager by SEBI;
c) bankruptcy or liquidation of the portfolio manager.

The discretionary portfolio manager shall invest funds of his clients in the securities listed or traded on a recognized stock exchange, money market instruments,[50] units of Mutual Funds and other securities as specified by SEBI from time to time, on behalf of their clients.

[48] This is not applicable to co-investment portfolio manager.
[49] Not applicable to co-investment portfolio manager.
[50] "Money market instruments" includes commercial paper, trade bill, treasury bills, certificate of deposit and usance bills.

The portfolio manager offering non-discretionary or advisory services to clients may invest or provide advice for investment up to 25% of the assets under management of such clients in unlisted securities, in addition to the securities permitted for discretionary portfolio management.

The portfolio manager may offer discretionary or non-discretionary or advisory services for investment upto 100 % of the assets under management of the large value of accredited investors in unlisted securities, subject to the appropriate disclosures in the disclosure document and the terms agreed upon between the client and the portfolio manager
The portfolio managers may invest in units of mutual funds only through direct plan.

The portfolio manager shall segregate each clients' funds and portfolio of securities and keep them separately from his own funds and securities and be responsible for safekeeping of clients' funds and securities.

The portfolio manager shall not hold the securities belonging to the portfolio account, in its own name on behalf of its clients either by virtue of contract with clients or otherwise.

The portfolio manager may, subject to authorization by the client in writing, participate in securities lending.

Foreign portfolio investors may avail of the services of a portfolio manager. Every portfolio manager shall appoint a custodian in respect of securities managed or administered by it, however, this regulation shall not apply to a) portfolio manager who provides only advisory services b) co-investment portfolio manager.

Submission of net-worth certificate

Every portfolio manager shall furnish to SEBI a net worth certificate issued by a chartered accountant as and when required by SEBI.

Reports to be furnished to the client

(1) The portfolio manager shall furnish periodically a report to the client, as agreed in the contract, but not exceeding a period of 3 months and as and when required by the client and such report shall contain the following details, namely:[51]

[51] The report referred to in sub-regulation may be made available on the website of the portfolio manager with restricted access to each client.

(a) the composition and the value of the portfolio, description of securities and goods, number of securities, value of each security held in the portfolio, units of goods, value of goods, cash balance and aggregate value of the portfolio as on the date of report;

(b) transactions undertaken during the period of report including date of transaction and details of purchases and sales;

(c) beneficial interest received during that period in the form of interest, dividend, bonus shares, rights shares, etc;

(d) expenses incurred in managing the portfolio of the client;

(e) details of risk foreseen by the portfolio manager and the risk relating to the securities recommended by the portfolio manager for investment or disinvestment;

(f) default in payment of coupons or any other default in payments in the underlying debt security and downgrading to default rating by the rating agencies, if any;

(g) details of commission paid to distributor(s) for the particular client.

On termination of the contract, the portfolio manager shall give a detailed statement of accounts to the client and settle the account with the client as agreed in the contract.

The client shall have the right to obtain details of his portfolio from the portfolio managers.

The portfolio manager shall take steps to rectify the deficiencies made out in the auditor's report within two months from the date of the auditor's report as specified.

Disclosures

A portfolio manager shall disclose to SEBI as and when required the following information namely:

(i) particulars regarding the management of a portfolio;
(ii) any change in the information or particulars previously furnished, which have a bearing on the certificate granted to him;
(iii) the names of the clients whose portfolio he has managed;
(iv) particulars relating to the net worth requirement.

Prior consent of client in regarding investments in the securities of associates/related parties[52]

The portfolio manager may make investments in the securities of its related parties or associates only after obtaining the prior consent of the client in such manner as may be specified by SEBI from time to time. The consent form shall have an option to indicate dissent in case the client does not want to undertake any investment in the securities of associates/related parties of the Portfolio Manager. The client can even specify a limit on investment in such securities. The portfolio managers are required to maintain records and documents pertaining to prior positive consent or dissent as the may be; instances of the passive breach of investment limits (if any), steps taken to rectify the passive breach of investment limits; waiver obtained from the client regarding rebalancing in the event of a passive breach of investment limits.

The portfolio manager shall ensure compliance with the prudential limits on investments as specified by SEBI.

Portfolio Manager shall invest upto a maximum of 30 percent of their client's portfolio (as a percentage of client's asset's under management) in the securities of their own associates/related parties. Further the portfolio manager has to ensure the following limits:

Limits on investment in securities of associates/ related parties of Portfolio Managers

Security	Limit for investment in single associate/related party (as percent of client's AUM)	Limit for investment across multiple associates/related parties (as percent of Client's AUM)
Equity	15 %	25 %
Debt and Hybrid securities	15 %	25 %
Equity+Debt+Hybrid securities [Hybrid securities includes REITs, InvITs, convertible debt securities and other securities of like nature)	30 %	

Note: These limits are applicable to direct investments by Portfolio Managers in equity and debt/hybrid securities of their own associates/related parties and not to any investments in mutual funds.

[52] Regulation 22 (1A) and SEBI Circular SEBI/HO/IMD/IMD-I/DOF1/P/CIR/2022/112 darted August 26, 2022 https://www.sebi.gov.in/legal/circulars/aug-2022/circular-for-portfolio-managers_62374.html

Exemption from strict enforcement of regulations in special cases:

SEBI has allowed exemptions from enforcement of SEBI Portfolio Managers Regulations for promoting innovation relating to testing new products, processes, services, business models, etc. in live environment of regulatory sandbox in the securities markets. The exemption may be given to any person or class of persons from the operation of all or any of the provisions of Portfolio Managers Regulations for a period not exceeding 12 months, subject to satisfying specified eligibility conditions prescribed by SEBI from time to time. [53]

11.4.1 Code of conduct for portfolio manager

The Code of conduct for the portfolio manager is specified in the Schedule III of the SEBI PMS Regulation.

1. A portfolio manager shall, in the conduct of his business, observe high standards of integrity and fairness in all his dealings with his clients and other portfolio manager.

2. The money received by a portfolio manager from a client for an investment purpose should be deployed by the portfolio manager as soon as possible for that purpose and money due and payable to a client should be paid forthwith.

3. A portfolio manager shall render at all times high standards of service, exercise due diligence, ensure proper care and exercise independent professional judgement. The portfolio manager shall either avoid any conflict of interest in his investment or disinvestment decision, or where any conflict of interest arises, ensure fair treatment to all his customers. It shall disclose to the clients, possible source of conflict of interest, while providing unbiased services. A portfolio manager shall not place his interest above those of his clients.

4. A portfolio manager shall not execute any trade against the interest of the clients in its proprietary account.

5. A portfolio manager shall not make any statement or indulge in any act, practice or unfair competition, which is likely to be harmful to the interests of other portfolio managers or is likely to place such other portfolio managers in a disadvantageous position in relation to the portfolio manager himself, while competing for or executing any assignment.

[53] Regulatory Sandbox means a live testing environment where new products, processes, services, business models, etc. may be deployed on a limited set of eligible customers for a specified period of time, for furthering innovation in the securities market, subject to such conditions as may be specified by SEBI.

6. A portfolio manager shall not make any exaggerated statement, whether oral or written, to the client either about the qualification or the capability to render certain services or his achievements in regard to services rendered to other clients.

7. At the time of entering into a contract, the portfolio manager shall obtain in writing from the client, his interest in various corporate bodies which enables him to obtain unpublished price-sensitive information of the body corporate.

8. A portfolio manager shall not disclose to any clients, or press any confidential information about his client, which has come to his knowledge.

9. The portfolio manager shall where necessary and in the interest of the client take adequate steps for the transfer of the clients' securities and for claiming and receiving dividends, interest payments and other rights accruing to the client. It shall also take necessary action for conversion of securities and subscription for/renunciation of rights in accordance with the clients' instruction.

10. A portfolio manager shall endeavour to (a) ensure that the investors are provided with true and adequate information without making any misguiding or exaggerated claims and are made aware of attendant risks before any investment decision is taken by them; (b) render the best possible advice to the client having regard to the client's needs and the environment, and his own professional skills; (c) ensure that all professional dealings are effected in a prompt, efficient and cost effective manner.

11. A portfolio manager shall not be a party to (a) creation of false market in securities; (b) price rigging or manipulation of securities; (c) passing of price sensitive information to brokers, members of the recognized stock exchanges and any other intermediaries in the capital market or take any other action which is prejudicial to the interest of the investors.

No portfolio manager or any of its directors, partners or manager shall either on their own or through their associates or family members or relatives enter into any transaction in securities of companies on the basis of unpublished price sensitive information obtained by them during the course of any professional assignment.

12. (a) A portfolio manager or any of its employees shall not render, directly or indirectly any investment advice about any security in the publicly accessible media, whether real-time or non-real time, unless a disclosure of his long or short position in the said security has been made, while rendering such advice.
(b) In case an employee of the portfolio manager is rendering such advice, he shall also disclose the interest of his dependent family members and the employer including their long or short position in the said security, while rendering such advice.

13. (a)The portfolio manager shall abide by the SEBI Act, Rules, and regulations made thereunder and the Guidelines/Schemes issued by SEBI.
(b) The portfolio manager shall comply with the code of conduct specified in the SEBI (Prohibition of Insider Trading) Regulations, 2015.
(c) The portfolio manager shall not use his status as any other registered intermediary to unduly influence the investment decision of the clients while rendering portfolio management services.

Eligible Fund Managers

The overseas funds availing fund management services from India based managers is designated as 'Eligible Investment Funds' and the India based fund manager providing such fund management services is designated as 'Eligible Fund Managers'. One of the requirements for a fund manager to become 'Eligible Fund Manager' is to be registered with SEBI under specified regulations.

SEBI (Portfolio Managers) Regulations, 2020 has a separate Chapter III for 'Eligible Fund Managers'. These regulations permit existing portfolio managers as well as new applicants, compliant with requirements specified under Section 9A of Income Tax Act, 1961, to act as 'Eligible Fund Managers'. Existing portfolio managers desirous of providing fund management services to overseas funds, if compliant with requirements specified in Section 9A of Income Tax Act, 1961, may pursue this activity on intimation and submission of declarations to SEBI. A new applicant desirous of providing fund management services to overseas funds, and compliant with the requirements specified in Section 9A of Income Tax Act, 1961, may seek registration with SEBI, as laid out in the Chapter III. Further, Chapter III also defines the obligations and responsibilities of such fund managers. Recognizing the different business requirements of such fund managers, as compared to the existing Portfolio Managers, SEBI has also identified certain provisions of the Portfolio Managers Regulations which would not be applicable to Eligible Fund Managers pertaining to their activities as fund manager to Eligible Investment Funds. Some of the provisions are listed below:

(a) High Water Mark Principle regarding calculation of fees, disclosure of fees;
(b) Obligation to act in a fiduciary capacity;
(c) Audit of overseas fund;
(d) Entering into agreement between the portfolio manager and overseas fund;
(e) Reporting requirements in respect of overseas fund;
(f) Minimum investment requirements (i.e. INR 50 Lakhs), etc.

[Portfolio Managers shall not organise investment portfolios as 'schemes' akin to mutual fund schemes while marketing their services to clients.]

Obligation and Responsibilities of Eligible Fund Managers

An eligible fund manager shall be required to:

(a) comply with the requirements specified under Section 9A of the Income-tax Act, 1961 or any amendment, notification, clarification, guideline issued thereunder;
(b) offer discretionary or non-discretionary or advisory services or a combination thereof to eligible investment funds;
(c) operate in accordance to its mutually agreed contract with the eligible investment funds
(d) provide all material disclosures to eligible investment funds;
(e) segregate funds and securities of each eligible investment fund;
(f) segregate the funds and securities of eligible investment funds from those of its other clients
(g) maintain and segregate its books and accounts pertaining to its activities as a portfolio manager to eligible investment funds and other clients;
(h) appoint a custodian:

Provided that the requirement of compliance with this sub-regulation would not arise in case an eligible investment fund has already appointed a custodian under the applicable act or regulations

(i) keep the funds of eligible investment funds in scheduled commercial banks.

Provided the requirement of compliance with this sub-regulation would not arise in case an eligible investment fund does not intend to invest in Indian securities.

(j) maintain any additional records as may be specified by SEBI and disclose the same to SEBI as and when required;
(k) provide quarterly reports to SEBI;
(l) ensure compliance with the Prevention of Money Laundering Act, 2002 and rules and regulations made thereunder;
(m) abide by the provisions in these regulations and circulars / guidelines issued by SEBI from time to time.

11.4.2. Code of conduct for PMS Distributors[54]

The code of conduct requires all PMS distributors to:

[54] https://www.sebi.gov.in/legal/circulars/feb-2020/guidelines-for-portfolio-managers_45981.html
https://www.sebi.gov.in/sebi_data/commondocs/feb-2020/Ann_c_p.pdf

i. Adhere to SEBI (Portfolio Managers) Regulations, 2020 and circulars issued from time to time related to distributors, distribution, advertising practices of Portfolio Management Services, etc.
ii. Maintain high standards of integrity, promptitude and fairness in the conduct of all their business.
iii. Act with due skill, care and diligence in the conduct of all their business.
iv. Consider investor's interest, risk profiling and suitability to their financial needs while marketing Portfolio Management Services.
v. Take necessary steps to ensure that the clients' interest is protected.
vi. Ensure that commission or incentive shall never form the basis for recommending Portfolio Management Services.
vii. Be fully conversant with the Disclosure Document, Investment Approaches, fees and charges and the terms of agreement to be entered between the client and the Portfolio Manager.
viii. Disclose to the clients all material information including the details of distribution commissions for various investment approaches.
ix. Assist clients in completing KYC and In-Person Verification related procedures.
x. Provide full and latest information about investment approaches and also highlight the assumptions made in performance calculations, risk assessments, performance projections etc., if any, for such investment approaches.
xi. Inform the clients about the risks and level of control over the administration of Portfolio associated with the type of Portfolio Management Services offered (i.e. Discretionary, Non-discretionary or Advisory).
xii. Abstain from assuring returns in any type of Investment Approach and from any kind of mis-representation.
xiii. Abstain from attracting clients through unethical means such as offer of rebate/gifts etc.
xiv. Maintain necessary infrastructure to provide support to clients in timely receipt of disclosure document, statement of portfolio and performance, statement of fees, audit report, etc.
xv. Maintain confidentiality of clients' details, deals and transactions, which they come to know in their business relationship.
xvi. Abstain from making negative statements about other Portfolio Managers or Investment Approaches. Make comparisons, if any, only with the similar and comparable products along with complete facts.
xvii. Not indulge in any manipulative, fraudulent or deceptive practices or spread rumours with a view to make personal gain.
xviii. Hold valid Certification, as specified by SEBI, at all times.

[Distributors have to mandatorily obtain registration from APMI][55]

11.5 Best practices for portfolio managers

In the following section some good practices to be followed by investment management professionals are discussed:

11.5.1 Research objectivity

Objectivity and independence of analysts doing research is an important attribute to strengthen investor confidence in the financial markets.

The CFA Institute has developed standards for research objectivity. These standards are intended to be specific, measurable norms for managing and disclosing conflicts of interest that may impede a research analyst's ability to conduct independent research and make objective recommendations. Firms that adopt the Chartered Financial Analyst(CFA) Institute-Research Objectivity Standards (ROS) demonstrate their commitment to manage conflicts of interest effectively and to provide full and fair disclosure of these conflicts to all investors who have access to their research.

A fundamental principle of ethical investment practice is that the best interests of the investing client must always take precedence over the interests of investment professionals and their employers. Every investment professional is personally responsible for ensuring that his or her independence and objectivity is maintained when preparing research reports, making investment recommendations, and taking investment action on behalf of clients.

The key requirements for firms adopting the ROS are given below:

1. Developing a formal written research objectivity policy.
2. Employees of the firm who present and discuss their research and recommendations in public appearances to fully disclose personal and firm conflicts of interest to the host or interviewer and, whenever possible, to the audience.
3. Firms must require research reports and recommendations to have a basis that can be substantiated as reasonable and adequate.
4. Firms that engage in, or collaborate on, investment banking activities must segregate research analysts from the investment banking department
5. Firms must establish and implement salary, bonus, and other compensation for research analysts that align compensation with the quality of the research and the accuracy of the recommendations over time and do not directly link compensation to

[55] Facilitating collective oversight of distributors for Portfolio Management Service through APMI. (See SEBI Circular No SEBI/HO/IMD/IMD-PoD-1/P/CIR/2024/32 dated May 02, 2024)

investment banking or other corporate finance activities on which the analyst collaborated.

6. Firms must implement policies and procedures that manage the working relationships that research analysts develop with the management of subject companies.
7. Firms must have policies and procedures that manage covered employees' "personal investments and trading activities" effectively.
8. Firms must provide full and fair disclosure of all conflicts of interest to which the firm or its covered employees are subject.
9. Firms must establish a rating system that is useful for investors and for investment decision-making; and provides investors with information for assessing the suitability of the security to their own unique circumstances and constraints.

11.5.2 Soft dollar practices

Investment management firms pay commission to brokerage firms for executing trades. Soft dollar arrangements are the one where investment managers pay a higher commission to the brokerage firm in lieu of enjoying additional services like access to their research reports, hardware, software or even non-research-related services, etc..

In portfolio management services, the investor is charged the brokerage fee. Soft dollar arrangement must be avoided as it is abusive in nature. There should be transparency with regard to the services availed by the buy side firm such as portfolio manager and the charges paid towards them.

For the mutual fund industry, SEBI has stated through a circular in 2016 (SEBI/HO/IMD/DF2/CIR/P/2016/42) that such arrangements between AMCs and brokers should be limited to only benefits (like free research report, etc.) that are in the interest of investors and the same should be suitably disclosed. The portfolio managers may also follow the same as a matter of good ethical practice.

11.6 Investor Charter for Portfolio Management Services

With a view to enhancing awareness of investors about the various activities which an investor deals with while availing the services provided by the portfolio managers, an investor charter has been issued by SEBI. The investor charter details different services provided by the portfolio managers to the investors along with estimated timelines, like account opening, agreement with the portfolio manager, periodic statements to the investors, investor grievance redressal mechanism, responsibility of investors etc.. All registered portfolio managers have to notify the same to their clients and also are required to prominently display on their websites.[56]

[56] Candidates are advised to read Investor Charter for PMS in more details: https://www.sebi.gov.in/legal/circulars/dec-2021/publishing-of-investor-charter-and-disclosure-of-investor-complaints-by-portfolio-managers-on-their-websites_54546.html

11.7 Cyber Security and Cyber Resilience framework (CSCRF) for Portfolio Managers[57]

With rapid technological advancement in the securities market, there is a greater need for maintaining robust cyber security and to have a cyber resilience framework to protect the integrity of data and guard against breaches of privacy.

As part of the operational risk management, the Portfolio Managers need to have robust cyber security and cyber resilience framework in order to provide essential facilities and services and perform critical functions in the securities market as Portfolio Manager.

Accordingly, all Portfolio Managers with asset under management as specified by SEBI should follow the Cyber security guidelines as published by SEBI. The applicability of various standards and guidelines of CSCRF is based on different categories of Regulated Entities(Res).

CSCRF follows a graded approach and classifies REs in the following five broad categories:

a) Market Infrastructure Institutions (MIIs)
b) Qualified REs
c) Mid-size REs
d) Small-size REs
e) Self-certification REs

The category of REs shall be decided at the beginning of the financial year based on the data of the previous financial year. Once the category of RE is decided, RE shall remain in the same category throughout the financial year, irrespective of any changes in the parameters during the financial year. The respective reporting authority shall validate the category at the time of compliance submission. Further, the criteria given and their thresholds for different categories will continue to be updated as and when required. Entity-wise categorization and corresponding thresholds for PMS players shall be as follows:

Sl No	Criteria	Qualified REs	Mid-size REs	Small-size REs	Self-certification REs
1	AUM (Assets under Management)	N.A	Above Rs. 3,000 crores	N.A	Rs. 3,000 Crores and below

Further, Portfolio Managers who fall under self-certification REs category and have less than 100 clients shall be exempted from the requirement of mandatory Market-SOC (M-SOC)[58]

[57] https://www.sebi.gov.in/legal/circulars/apr-2025/clarifications-to-cybersecurity-and-cyber-resilience-framework-cscrf-for-sebi-regulated-entities-res-_93734.html

[58] M-SOC, refers to a Security Operations Centre (SOC) that are specifically designed to cater to the cybersecurity needs of smaller registered entities in the financial market, offering a more accessible and cost-effective solution than building a full-fledged SOC from scratch.

Chapter 11: Sample Questions

1. Record of transactions to be maintained under the Prevention of Money Laundering Act includes Cash transactions of the value of more than _____.

a. Rs.10 lakh

b. Rs. 20 lakh

c. Rs. 25 lakh

d. Rs. 1 crore

2. A foreign portfolio investor can invest in the following securities?

a. Domestic Mutual Fund Schemes

b. Derivatives traded on a recognised stock exchange

c. Rupee denominated credit enhanced bonds

d. All of the above

3.The objective of the SEBI (Prohibition of Insider Trading) Regulations is to prohibit insider from _____ on matters relating to insider trading.

a. Dealing

b. Communicating

c. Counselling

d. All of the above

4.The SEBI Fraudulent and Unfair Trade Practices Regulations prohibit a person to, directly or indirectly _____ securities in a fraudulent manner.

a. Buy

b. Sell

c. Deal In

d. All of the above

CHAPTER 12: INTRODUCTION TO INDICES

LEARNING OBJECTIVES:

After studying this chapter, you should know about:

- The uses of Indices
- How indices are created – Index Methodologies
- Factors differentiating the indices
- Types of indices

12.1 What is an Index?

It is intuitive that performance of various assets traded in a market are closely tied to the performance of the market. Investors have broad view about the performance of their investments by tying the performance of the investments to the market. In a top-down manner, knowledge about the market performance provides a quick assessment about their investments. Performance of a market where many securities are traded require construction of a measure reflecting all the securities being traded in that market. Indices are such a composite measure.

Dictionary meaning of the word index is "a system of numbers used for comparing values of things that change according to each other or a fixed standard". Market indices serve the same purpose. They reflect the change in the value of the underlying over a period of time and also from the base value used as a reference.

12.2 Uses of Indices

Originally index was created with a view to provide access to a simple indicator reflecting security market information. Charles H. Dow and Edward D. Jones introduced the Dow Jones Average, the world's first security market index, in 1884, with this single objective only. However, with the developments in financial markets and investment management, the uses of indices have found broader application as:

- providing a gauge of the market: as mentioned above the original purpose of market index was to provide a gauge of the performance of underlying market. An index reflects the collective opinion of market participants, investor attitudes and behavior about the market dynamics.
- Benchmarking the investments and actively managed portfolios: as investors find it difficult to assimilate the absolute performance of their portfolio, they use indices as benchmarks to evaluate the performance of active portfolio managers to develop a sense of how the portfolio manager has performed relative to the index.

- Underlying portfolio for creation of index funds: Indices are serving the basis as the model portfolio for the development of index funds. Index funds play an important role in passive investment style.
- Proxy for the market portfolio of risky assets when calculating the systematic risk of an asset: as discussed in Chapter 4, the capital asset pricing model (CAPM) states that every security or portfolio is to be priced for its market risk. The market portfolio in the CAPM consists of all risky securities. However, in practice broad based indices are taken as proxy of market portfolio, hence providing the extent of systematic risk of every investment.

12.3 Factors differentiating the indices

There are over two million indices available globally[59]. Though all are intended to reflect the overall movements of a group of securities, the differentiating factors are size and scheme of assigning weights.

The first factor is the sample size used to create an index. Today, powerful computers do allow inclusion of all the stocks on an exchange or market. However, many popular indices are sample based as earlier times. Different sample sizes are taken to represent the same segment of securities. For example, the Indian stock market large cap segment has BSE Sensex 30 and NIFTY 50 as the two popular indices, each having a different sample size. While selecting the sample, care should be taken that the sample is representative of the population.

The second differentiating factor is to allocate weight for each constituent in the sample. Weights can be assigned on the basis of price (a price-weighted index), on the basis of value (a market-value weighted index). Index can also be created by assigning equal weights to the constituents (an equal-weighted index) or by using some fundamental variable like sales, earnings, or return on equity (a fundamental weighted index). Of the four ways of assigning weight to the constitutes, the most popular one is the value weighted method.

12.3.1 Price weighted index

The simplest method of assigning weights to constituents of an index is price weighting. Dow Jones Industrial Average is one example of price weighted index. It is computed by summing the current prices of the constituent securities and dividing the sum by a divisor.

The value of the index is calculated by using the following formula:

$$the\ value\ of\ the\ index\ on\ day\ 't' = \sum_{i=1}^{n} \frac{the\ closing\ price\ of\ stock\ i\ on\ the\ day\ 't'}{the\ adjusted\ divisor\ on\ day\ 't'}$$

[59] Index Industry Association (IIA), a trade association for the index industry quantify the index universe and, according to its study, in 2019, there were 2.96 million indexes globally.

The concept of index divisor is explained in Box 12.1.

Box 12.1: Index Divisor

The concept of Index Divisor is an important concept to understand the computation of index value. It is a number chosen at inception. It is initially chosen in such a way that the index has a convenient initial value, such as 100 or 1,000. For example, BSE Sensex has an initial value of 100. That means on the inception day the total market capitalization upon index divisor was 100 in case of BSE Sensex. In case of price weighted index instead of market capitalization, it is the sum of the prices in the numerator and divisor in the denominator giving a convenient value of 100 or 1000.

The index provider adjusts the value of the divisor as and when necessary to avoid changes in the index value that are unrelated to changes in the prices of its constituent securities. For example, when changing index constituents, the index provider may adjust the divisor so that the value of the index with the new constituents remains same as the value of the index prior to the changes.

Illustration 12.1 explains how the divisor is adjusted in case of a stock spilt, for a price weighted index.

Illustration 12.1: Adjustment in Index divisor for stock split (for a price weighted index)

Stock	Before Split	After stock split of stock E 2 for 1
A	Rs.4	Rs 4
B	Rs 6	Rs 6
C	Rs 8	Rs 8
D	Rs 9	Rs 9
E	Rs 10	Rs 5
	SUM 37	SUM 32
	37/3.7=10	32/3.2=10

There are five stocks in the index. When a stock splits, the divisor is so adjusted to keep the level of the index as same. In this example divisor is adjusted from 3.7 to 3.2. The adjusted divisor ensures that the value of the index is not fluctuated by these actions and new value for the index is the same as it would have been without the split.

The merit of this method is the ease of its calculation as it is simply the arithmetic mean of current stock prices. Before the advent of supercomputing machines, the ease of calculation made sense. However, this advantage faded away due to the computing developments and other usages of indices. The reason for the same is the pitfall of the method. Because the index is price weighted, a high-priced stock carries more weight and exercises greater

influence than a low-priced stock. A 5 per cent change in Rs.5000 stock will cause a larger influence than a 50 per cent change in a Rs. 50 stock. The second limitation is the downward bias of this method. High growth stocks will tend to have higher prices and because such stocks tend to split, these stocks of growing companies will consistently lose weight within the index.

12.3.2 Value Weighted Index

A value-weighted index is generated by taking into consideration the market capitalization of the securities in the index. In case of a stock index, the initial total market value of all stocks used in the index will be accounted in as sum of individual security's Market Value (Number of Shares Outstanding (or freely floating shares) × Current Market Price).

Under this method the weight on each constituent security is determined by dividing its market capitalization (or free-float market capitalization[60], as the case may be) by the sum of the market capitalization (or the sum of free-float market capitalization) of all the securities in the index. The following example illustrate how the weights of the securities are arrived at under this method.

Let us say an index is made up of five securities and on the day of inception their prices and market capitalization is given as below (Illustration 12.2).

Illustration 12.2: Calculation of weights of the securities in Value weighted Index at T_0

Stock	Current Price	Outstanding Shares	Market cap	Weighting
A	Rs. 3	50	Rs.150	15.46%
B	Rs. 1	50	Rs.50	5.15%
C	Rs. 7	70	Rs.490	50.52%
D	Rs. 9	20	Rs.180	18.56%
E	Rs. 10	10	Rs.100	10.31%
		Total Market Capitalisation	**Rs.970**	**100.00%**

The weight of each security is arrived by dividing its market cap by the total market capitalisation. For example, for Security A it is 150/970 = 0.1546 or 15.46%.

In case, base value of the index is to be kept at 100, the total market capitalization will need to be divided by index divisor which will give a value of 100. Index divisor in this illustration will be 9.7 (970/100).

[60] BSE Sensex was initially calculated based on the "Full Market Capitalization" methodology and was shifted to the free-float methodology with effect from September 1, 2003
NIFTY 50 is shifted to the free float methodology from June 26, 2009.

The index provider will keep adjusting the divisor in such a way that the index levels are consistent and reflects only price fluctuations.

Let us now say that after 3 months on the day of index revision the composition of the index is as shown in Illustration 12.3.

Illustration 12.3: Calculation of weights of the securities in Value weighted Index at T_1

Security	Current Price	Outstanding Shares	Market cap	Weighting
A	Rs.0.5	50	25	2.99%
B	Rs.1	50	50	5.99%
C	Rs.7	70	490	58.68%
D	Rs.9	20	180	21.56%
E	Rs.9	10	90	10.78%
		Total market cap	**835**	**100.00%**

The value of the index will be = 835/9.7 = 86.08 reflecting that index has fallen from 100 to 86.

Let's say the index provider following the index construction methodology finds that security A is not meeting the criteria of being in the index. In its place it introduces security X (Illustration 12.4).

Illustration 12.4: Calculation of weights of the securities in Index at reconstitution of Index

Stock	Current Price	Outstanding Shares	Market cap	Weighting
X	Rs.6	70	420	34.15%
B	Rs.1	50	50	4.07%
C	Rs.7	70	490	39.84%
D	Rs.9	20	180	14.63%
E	Rs.9	10	90	7.32%
		Total market cap	**1230**	**100.00%**

Since market capitalization of security A is not same as that of security X, the index value changes accordingly. To make index value consistent, index divisor can be chosen in such a way that the value of the index remains the same after the restructuring of the index. Hence new value of the Index divisor will be 14.28 (i.e. 1230/86.08).

In a value-weighted index, a specified percentage change in the value of a large company has a greater impact than a comparable percentage change for a small company as the weight of individual stocks in the index is determined by the market value of the stocks. Since the index changes are value driven, there is an automatic adjustment for stock splits and other capital changes in a value-weighted index. This makes value driven index an ideal choice for mounting

index funds and index derivatives as a security's weight in the index automatically adjusts to the market value of its outstanding securities changes.

Box 12.2: Concept of Free Float

The free float is a measure of actual availability of stocks of a company in the market for public investment. The goal to calculate Free Float is to distinguish between strategic (control) shareholders, whose holdings depend on concerns such as maintaining control rather than the economic fortunes of the company, and those holders whose investments depend on the stock's price and their evaluation of a company's future prospects.

While calculating free-float market capitalization the following categories of shareholdings are generally excluded:

- Shares held by founders/directors/acquirers which have control element
- Shares held by persons/ bodies with "Controlling Interest"
- Shares held by the Government(s) as promoters/acquirers
- Holdings through the Foreign Direct Investment (FDI) route
- Strategic stakes by private corporate bodies/ individuals
- Equity held by associate/group companies (cross-holdings)
- Equity held by Employee Welfare Trusts
- Locked-in shares and shares which would not be sold in the open market in normal course

12.3.3 Equal Weighted Index

In this method, the constituent securities carry equal weight irrespective of their prices or market capitalization. As an example, a stock with a price of Rs. 2500 is as important as a Rs. 40 stock. Similarly, the stock of the largest company by market capitalization is as important as the stock of a company with much smaller capitalization. This can be seen in the illustration 12.4.

Illustration 12.4: Equal weighted Index at T_0

Stock	Current Price	Outstanding Shares	Market cap	Weighting
A	Rs.6	70	420	20%
B	Rs.1	50	50	20%
C	Rs.7	70	490	20%
D	Rs.9	20	180	20%
E	Rs.9	10	90	20%
		Total market cap	**1230**	**100.00%**

The column on outstanding shares which leads to calculation of market capitalization when multiplied with prices is irrelevant here. A convenient value of 100 or 1000 may be taken as the starting base value of the index.

It is equivalent of investing the same rupee amount in each stock. To understand the movement of such index, let us say the next day the prices of the stocks change as follows (Illustration 12.5).

Illustration 12.5: Equal Weighted index at T_1

Stock	Price at t_0	Outstanding Shares	Market cap at t_0	Price at t_1	Return[61]
A	**6.00**	**70**	**420**	**10**	**67%**
B	**1.00**	**50**	**50**	**1.5**	**50%**
C	**7.00**	**70**	**490**	**8**	**14%**
D	**9.00**	**20**	**180**	**8**	**-11%**
E	**9.00**	**10**	**90**	**10**	**11%**

(67%+50%+14%+-11%+11%)/5 = 26%
If at T_0 starting value of index was based at 100, at T_1 the index value is 100 + 26=126.

$$I_0 (1+\%\Delta) = I_1$$

The movements in the index is based on the arithmetic mean of the percent changes in price or value for the stocks in the index.

The index has moved up by 26%. As can be seen here, it is equivalent of investing an exactly same amount of money in constituent securities. If an investor has done that, between two periods the value is up by 26%. If the investors has started with Rs.100 on T_0, on T_1 it has become Rs. 126.This calculation is based on an arithmetic average but some equal weighted indices use a geometric average calculation as well.
Equal weighted methodology has both advantages and disadvantages. The merit of this method is that it does not have price or value bias. However, when it comes to the usage of this index for creating index funds, such funds will have higher transaction costs, as periodically portfolio needs to be rebalanced so that equal amount stay invested in the constituent securities. In case of equal weight index based funds, if the price of a stock in the index fund goes down, the fund will buy more shares, and if the price goes up, it will sell shares to balance the fund equally in the index. The buying and selling activity leads to high portfolio turnover rate and higher transaction cost.

12.3.4 Fundamental weighted and factor-based Index

[61] (Price on t_1-Price on t_0)/Price on t_0

One criticism of value weighted indices is it results in overweighting overvalued stocks and underweighting undervalued stocks. To counter such structural issue, indexers begun to weight securities by considering some fundamental factors of the company like book value, cashflows, dividend, sales, profits, net assets etc.. These sets of indices are also referred as alternative indices.

While constructing fundamental index, the fundamental factor needs to be identified. It can be just one factor or a combination of many factors. In case of many factors the weights of each one of them needs to be determined. To understand the weighting metric, let us look at an example. Assume the number of companies in an index is three. Table 12.1 gives the last year sales figure for these companies.

Table 12.1 Calculation of weights of the securities in Fundamental weighted Index at T_0

Company	Previous year Sale	Weight of the company in the index	Price of the stock of the company
A	Rs. 100 Cr	10%	Rs. 100
B	Rs. 500 Cr	50%	Rs. 1200
C	Rs. 400 Cr	40%	Rs. 850

Now assume that the base value of the index is 100 and investment is made in the three companies in the above mentioned weights. At T_1 the prices of the three stocks have moved as follows (Table 12.2).

Table 12.2 Calculation of price movement in Fundamental weighted Index

Company	Price of the stock of the company at T_0	Price of the stock of the company at T_1	Percentage % during T_0 to T_1
A	Rs. 100	Rs. 170	70%
B	Rs. 1200	Rs. 1500	25%
C	Rs. 850	Rs. 750	-11.76%

The index has moved from 100 to (70%*10%)+(25%*50%)+(-11.76%*40%) = 14.80%, and the index value is 114.80.

Some factors of securities return are specific to individual securities, whereas some factors are common to a group of securities. And the risk premium is the reward for exposure to these systematic risk factors.

12.4 Index Methodologies

Index providers broadly have to make two decisions when creating the index—the number of constituents in the index and how those constituents are assigned weights. The four different ways of assigning the weights are discussed above. Apart from these two important decisions the index providers follow certain criteria for selecting the stocks in the index. They follow a specific methodology for index construction.

For example, S&P BSE Sensex follows both quantitative and qualitative criteria for selecting stocks for inclusion[62]:

Eligible Universe. The index is derived from the constituents of the S&P BSE 100. The inclusion of Differential Voting Rights (DVRs) in the index will result in more than 30 stocks in the index. However, the number of companies in the index remains fixed at 30. Stocks in the eligible universe must satisfy the following eligibility factors in order to be considered for index inclusion:

- **Listing History.** Stocks must have a listing history of at least six months at BSE.
- **Trading Days.** The stock must have traded on every trading day at BSE during the six month reference period.
- **Multiple Share Classes.** DVRs satisfying the above eligibility criteria are aggregated with the company's common stock and index construction is done based on the aggregated company data as detailed below.

Index Construction

1. All companies meeting the eligibility factors are ranked based on their average six month float- adjusted market capitalization. The top 75 are identified.
2. All companies meeting the eligibility factors are ranked again based on their average six month total market capitalization. The top 75 are identified.
3. All companies identified based on steps 1 and 2 are then combined and sorted based on their annualized traded value. Companies with a cumulative annualized traded value greater than 98% are excluded.
4. The remaining companies are then sorted by average six-month float-adjusted market capitalization. Companies with a weight of less than 0.5% are excluded.
5. The remaining companies from step 4 are then ranked based on their average six-month float- adjusted market capitalization, and are selected for index inclusion according to the following rules:
    1. The top 21 companies (whether a current index constituent or not) are selected for index inclusion with no sector consideration.
    2. Existing constituents ranked 22–39 are selected in order of highest rank until the target constituent count of 30 is reached.
    3. If after this step the target constituent count is not achieved, then non-constituents ranked 22–30 are selected by giving preference to those companies whose sector is underrepresented in the index as compared to the sector representation in the S&P BSE All Cap.

[62] S&P BSE Indices Methodology - January 2021

4. If after this step, the target constituent count is still not achieved, non-constituents are selected in order of highest rank until the target constituent count is reached.

Annualized traded value is calculated by taking the median of the monthly medians of the daily traded values over the six-month period. The annualization is calculated using 250 trading days in a year.

All additions and deletions are made at the discretion of index committee.

Constituent Weightings: Index constituents are weighted based on their float-adjusted market capitalization.

On the other hand, to find a place in NIFTY 50 the stock's trading frequency should be 100% in the last six months. Also, the security should have traded at an average impact cost of 0.50 % or less during the last six months for 90% of the observations for a portfolio of Rs. 10 crores.[63] Further to be eligible for inclusion in NIFTY 50 index the company should have the average free-float market capitalisation at least 1.5 times the average free-float market capitalization of the smallest constituent in the index.[64]

These are only two illustrations. Different index providers follow their own methodology for creating indices. Broadly they follow the principles of index being representative of the segment it is created for and serves the purposes it is created for. Index values are disseminated up to two decimal places.

12.5 Stock market indices

A wide variety of stock market indices exist, including broad market, sectoral, and style indices.

12.5.1 Broad based indices

As the name suggest broad market indices represent an entire market segment and typically represent a significant percentage of the selected market for example Nifty 500[65].

12.5.2 Market Capitalization based indices

Stocks are also categorized on the basis of market capitalization into large cap, mid cap and small cap stocks. There are indices created to reflect the performance of each of these

[63] Impact cost is the cost of executing a transaction in a security in proportion to its index weight, measured by market capitalization at any point in time. This is the percentage mark- up suffered while buying/selling the desired quantity of a security compared to its ideal price -- (best buy + best sell)/2.

[64] https://www1.nseindia.com/content/indices/Method_NIFTY_Equity_Indices.pdf

[65] The NIFTY 500 Index represents about 96.1% of the free float market capitalization of the stocks listed on NSE as on March 29, 2019. The Russell 3000, consisting of the largest 3,000 stocks by market capitalization, represents approximately 98 per- cent of the US equity market.

capitalization ranges. The examples of some market capitalization based indices are provided in Box 12.2.[66]

When the capitalization of stocks undergoes changes, stocks migrate from one category to another.

Box 12.2: Market Capitalisation Based Indices

NIFTY 50 Index: The NIFTY 50 index is a well-diversified 50 companies index reflecting overall market conditions. NIFTY 50 Index is computed using free float market capitalization method. HDFC Bank Ltd. Reliance Industries Ltd, Tata Consultancy Services Ltd. ITC Ltd. are examples of the constituents.

NIFTY Next 50 Index: The NIFTY Next 50 Index represents 50 companies from NIFTY 100 after excluding the NIFTY 50 companies. Adani Green Energy Ltd, Avenue Supermarts Ltd., Info Edge (India) Ltd are example of its constituent.

NIFTY 100 Index: The NIFTY 100 tracks the behaviour of combined portfolio of two indices viz. NIFTY 50 and NIFTY Next 50.

NIFTY 200 Index: The NIFTY 200 Index is designed to reflect the behaviour and performance of the large and mid-market capitalization companies. NIFTY 200 includes all companies forming part of NIFTY 100 and NIFTY Midcap 100 Index.

NIFTY 500 Index: The NIFTY 500 index represents top 500 companies selected on the basis of full market capitalization from the eligible universe.

NIFTY Midcap150: Index NIFTY Midcap 150 represents the next 150 companies (companies ranked 101-250) based on full market capitalization from NIFTY 500. This index intends to measure the performance of mid-market capitalization companies.

12.5.3 Style Indices

An important development in equity portfolio management during the last decades has been the creation of portfolio strategies based on value and growth oriented investment styles. Portfolio managers define themselves as “value fund managers” or “Growth fund managers”. Subsequently value and growth indices are developed to enable the benchmarking of such portfolios.

There are many ways to categorized the stocks into growth and value stocks. One popular way is on the basis of some ratios like P/E ratio, P/B ratio and dividend yield. Stocks with low P/B, low P/E ratio and high dividend yield are categorized as value stocks. Stocks with high P/B, high P/E ratios and low dividend yield are categorized as growth stocks. The distinction between value and growth investing can be best appreciated by considering the thought process of a portfolio manager for each style.

Let us take the case of P/E ratio to understand the rationale better. Price/earnings ratio for any company can be expressed as:

P/E Ratio = Current Price per Share/Earnings per Share

[66] Constituents examples as on Dec. 2020.

Value and growth managers will focus on different aspects of this ratio while evaluating stocks. A growth-oriented investor will focus on the denominator i.e. earning of the P/E ratio and its economic determinants. The portfolio manager will look for companies that he or she expects to exhibit rapid growth in EPS in the future. He/she implicitly assume that the P/E ratio will remain constant or more or less same over the near term. That means as forecasted earnings growth is realized the stock price will rise.

Value-oriented investor on the other hand focus on the price component (i.e., the numerator) of the P/E ratio. The portfolio manager believes that the price of the stock is "cheap" by some means of comparison. The portfolio manager does not care about current earnings or the fundamental drivers of earnings growth; and implicitly assume that the P/E ratio is below its normal level and that the market will soon "correct" this situation by increasing the stock price with little or no change in earnings.

In conclusion, the growth portfolio manager focuses on the current and future economic "story" of a company, with less regard to share valuation. The value portfolio managers focuses on share price in anticipation of a market correction and, possibly, improving company fundamentals.

Style indexes generally have much higher turnover than do broad market indexes because valuation ratios change over time, stocks frequently migrate from one style index category to another on reconstitution dates. The portfolio manager would be required to rebalance the portfolio accordingly to remain consistent with the investment philosophy.

12.5.4 Capitalization and style indices

The three market-capitalization groups can be blended with two styles to create further cap based style segments such as—Large cap value, Large cap growth, Mid cap value, Mid cap growth, Small cap value, Small cap growth. These indices are very useful for benchmarking purposes for portfolio managers pursuing capitalization based investment styles.

12.5.5 Sectoral indices

Another popular category of equity indices is sectoral indices. These indices track different sectors—such as IT, Banking, FMCG, Pharma etc. Investors may be interested in gauging the performance of various sectors. Sectoral indices serve as a benchmark for evaluating the performance of sectoral portfolios.

Some of the sectoral indices are Nifty Auto Index, Nifty Bank Index, Nifty Consumer Durables Index, Nifty Financial Services Index, S&P BSE Energy, S&P BSE Auto, S&P BSE Realty.

12.5.6 Total Return Index

Most of the indices are price based indices. A price index does not consider the returns arising from dividend receipts. Only capital gains arising due to price movements of constituent stocks are indicated in a price index. Therefore, to get a true picture of returns, the dividends received from the constituent stocks also need to be factored in the index values. Such an index, which includes the dividends received, is called the Total Returns Index.

Total Returns Index reflects the returns on the index arising from (a) constituent stock price movements and (b) dividend receipts from constituent index stocks.

For calculation of TR index, information required is— Price Index close, Price Index returns, Dividend payouts in Rupees, Index Base capitalisation on ex-dividend date, Dividend payouts as they occur are indexed on ex-date.

$$\text{Indexed Dividend} = \frac{\text{Dividend payout } (₹)}{\text{Base cap. of index } (₹)}$$

Indexed dividends are then reinvested in the index to give TR Index.

$$\textbf{Total Return Index} = \text{Previous TR} * \left[1 + \left(\frac{(\text{Today's PR Index} + \text{Indexed Dividend})}{\text{Previous PR Index}} - 1\right)\right]$$

Base for both the Price index close and TR index close will be the same.

An investor in index stocks should benchmark his investments against the Total Returns index instead of the price index to determine the actual returns vis-à-vis the index.

12.5.7 Dollar denominated index

Dollar denominated index has been constructed as an instrument for measuring returns on their equity investment in the US dollar terms. Foreign investors with an equity exposure in India would like to have an instrument for measuring returns on their equity investment in dollar terms. To facilitate this, dollar denominated indices are created. An example of the same is NIFTY50 USD.

NIFTY50 USD, a dollar linked variant of NIFTY 50 index has been constructed as an instrument for measuring returns on their equity investment in the US dollar terms. NIFTY50 USD is NIFTY 50, measured in dollars.[67] It is calculated as follows:

[67] Base date of NIFTY50 USD is same as NIFTY 50 i.e. November 3, 1995 and the base index value is 1000 points.

Closing value of NIFTY 50 * Exchange rate as on base date/ Exchange rate for the day

NIFTY 50 is also computed in Australian Dollar (AUD) and Canadian Dollar (CAD).

12.5.8 Global Equity Indices

Index providers have created global indices for investors who invest in global markets. These indices enable the investors to analyze and compare developed and emerging markets at varying levels of granularity. Many of these indices are covering over 90% of each market's investable market capitalization, thus are highly representative. Some popular examples of global equity indices are provided in Box 12.3.

Box 12.3: Global Indices

The **S&P Global Broad Market Index (BMI)** series is the global index since 1989. This index series covers all countries and includes approximately 10,000 stocks from 25 developed and 25 emerging markets

The **MSCI World Index** captures large and mid-cap representation across 23 Developed Markets (DM) countries. With 1,601 constituents, the index covers approximately 85% of the free float-adjusted market capitalization in each country. It is Morgan Stanley Capital International(MSCI) Index.

FTSE Global Equity Index series provides a global equity index framework. It includes over 16,000 large, mid, small, and micro-cap securities across 49 developed and emerging markets globally. It is Financial Times Stock Exchange(FTSE) Index

GDP driven versus market capitalization driven

Most of the local as well as global indices are market capitalisation (or free float market cap) weighted indices. Market cap weighted indices ignore the unlisted companies. All companies contribute to the economy whether listed or not. For many countries state owned unlisted companies contribute significantly to the economy. Also, market cap based global indices tend to be tilted towards developed countries because developed countries have relatively higher market cap to GDP ratio. Emerging and frontier markets tend to get underrepresented in market-based indices. Hence, there is strong case for creating the world market indices by considering the GDP of the countries. Instead of allocating weights to the countries on the basis of the market capitalization, country weights are allocated on the basis of GDP of the countries.

Leading index providers such as MSCI has created GDP based global index. The MSCI World GDP Weighted Index is based on the MSCI World Index, its parent index, and includes large

and mid-cap stocks across 23 Developed Markets (DM) countries. In this index the weight of each country is derived from its economic size (using GDP data) rather than the size of its equity market. The MSCI World GDP Weighted Index was launched on Sep 30, 1988.

12.5.9 MSCI Indices for India

Although stock market indices are available for individual countries closely following respective markets within each country, a problem arises in comparing the results implied by these indices for different countries. As mentioned above, different index providers follow different methodologies for selecting the securities and weighting of the securities etc. With a view to overcome comparability problems, few index providers have computed a set of consistent country stock indices. The leading index provider amongst them is MSCI. MSCI indices provide consistent treatment across all markets.

The MSCI India Index is designed to measure the performance of the large and mid-cap segments of the Indian market. With 86 constituents, the index covers approximately 85% of the market capitalization of Indian equity universe. The index is based on the methodology that aims to provide exhaustive coverage of the relevant investment opportunity set with a strong emphasis on index liquidity[68] investability[69], and replicability[70]. The index is reviewed quarterly—in February, May, August and November. During the May and November semi-annual index reviews, the index is rebalanced and the large and mid-capitalization cut-off points are recalculated. Global investors and fund managers may prefer this index for benchmarking the portfolio.

12.6 Bond Market Indices

Stock market indices are so popular that when investors refer to a market index, they mean stock market index. Investors seem to know little about the growing number of bond-market indices currently available because these indices are not as widely published as their equity counterparts. These indices are as important as equity market indices as they seem to be serving the same purposes for bond markets that the equity market indices serve.

The universe of bond market is much bigger and broader. The size of bond markets is much larger than the size of equity market. Issuers in bond market range from governments, municipalities and local bodies, corporates, financial institutions etc.. Further unlike equity, a company may issue many series of bonds with varying risk profile attracting different credit ratings. Further the universe of bonds changes constantly because of new issues entering and old bonds maturing. This makes the selection of securities for inclusion in the index a challenging task compared to constructing equity market indices. Overcoming these

[68] Liquidity is measured by impact cost.
[69] The investability of an index is a function of two variables - the liquidity of the underlying constituents and the weight of the securities in the index. The investability of an index determines its investment capacity.
[70] It should be possible to passively replicate the benchmark.

challenges, index providers have constructed bond indices in covering various segments and credit profiles in the bond markets.

12.6.1 Government Securities Index

Government Securities Index is designed to track the performance of Indian sovereign securities. Examples of sovereign securities indices are provided in Table 12.8. NIFTY G-Sec Indices represent Government of India bonds across 6 distinct duration buckets. The index is rebalanced and reconstituted on a monthly basis.

Table 12.8: Sovereign Securities Indices

Duration categories	Macaulay Duration Range	Index Name
Ultra-Short Duration	3 months – 6 months	NIFTY G-Sec Ultra Short Duration
Low Duration	6 months – 12 months	NIFTY G-Sec Low Duration
Short Duration	1 to 3 years	NIFTY G-Sec Short Duration
Medium Duration	3 to 4 years	NIFTY G-Sec Medium Duration
Medium to Long Duration	4 to 7 years	NIFTY G-Sec Medium to Long Duration
Long Duration	Greater than 7 years	NIFTY G-Sec Long Duration

Nifty G-Sec Index Methodology

- Upto 3 liquid bonds, within a duration bucket, based on turnover during the previous month shall be eligible to be part of the index.
- The outstanding amount of the bond should be more than Rs. 5,000 crores.
- Each bond is assigned weight based on its amount outstanding.
- The index is rebalanced and reconstituted on monthly basis

NIFTY T-Bills Indices

NIFTY T-Bills Indices consist of 5 indices which individually track the performance of T-bill representing 5 distinct maturity segments (30 day, 60 day, 91 day, 182 day and 1 year) and 1 all maturity index tracking aggregated performance across maturities (Table 12.9). The indices are reconstituted on a weekly basis.

Table 12.9: Sovereign Securities Indices

Index Name	Residual Maturity
NIFTY 30 Day T-Bill Index	30 Day
NIFTY 60 Day T-Bill Index	60 Day
NIFTY 91 Day T-Bill Index	91 day

NIFTY 182 Day T-Bill Index	182 day
NIFTY 1 Year T-Bill Index	1 year All Maturity
NIFTY All Maturity T-Bill Index	All Maturity

5 distinct maturity based indices represents performance of T-Bill of 30-days, 60-days, 91-days, 182-days and 1-year maturity. NIFTY All Maturity T-Bill Index represents the aggregated performance of 3 distinct maturity based T-Bill indices. The index is rebalanced and reconstituted on every T-bill auction.

Nifty T-Bill Index Methodology

For 91 Day, 182 Day & 1 Year T-Bill, the most recently issued T- bill is considered as the constituent for the Index. For 30 Day T-Bill & 60 Day T-bill, security with residual maturity closest to 30 day & 60 day respectively is considered as the constituent for the index.

12.6.2 Corporate Bond Index

Corporate bond indices are created to measure the performance of corporate bonds. NIFTY AAA, AA+, AA, AA- and Banking & PSU Bond Indices measures the performance of corporate bonds across 6 duration buckets (Macaulay Duration) and distinct rating segments. Each index may consist up to 14 issuers with each issuer being represented by its most liquid bonds. [71]

NIFTY A Bond Indices measures the performance of A rated corporate bonds across 2 Macaulay duration buckets - Short (up to 3 years) and Long (> 3 years). Index consist of all bonds with issuance size greater than Rs. 50 cr. within the respective Macaulay duration range. It is rebalanced and reconstituted on a monthly basis. Issuers are selected based on primary market issuances. Weights to selected bonds are assigned based on issuance size.

NIFTY AA Category Bond Indices measure the aggregated performance of AA+, AA and AA- rated corporate bonds across 6 duration buckets (Macaulay Duration). Each index is derived from the underlying AA+, AA and AA- rated indices of the concerned Macaulay duration bucket. With up to 14 most liquid issuer from each rating sub category, these indices are well-diversified.

In addition to these indices NIFTY Fixed Income Aggregate Indices consist of 13 indices which measure the performance of various fixed income portfolios covering Government securities, Corporate bonds of different credit rating categories, Commercial papers, Certificate of deposits, T-Bills and Overnight rate.

[71] liquidity score derived from aggregate trading value, number of days traded and number of trades of all the eligible bonds of issuers during the previous quarter. The composite liquidity score is calculated by allocating 80% weights to trading value, 10% weights to number of days traded and 10% to number of trades

12.6.3 High Yield Bond Index

The high-yield bond market includes bonds that are not investment grade— that is, they are below investment grade rated. Globally there are index providers who have created indices relating to this segment of market.

12.6.4 Global Bond Index

Just the way there are indices for global equity market, similarly index providers have created indices for the global bond market. for example, FTSE Russell offers a comprehensive range of indices designed to measure the performance of fixed income markets globally. These indices measure government, government-sponsored, collateralized, and corporate bonds from both developed and emerging countries and covers more than 100 countries and includes 18,000+ unique bonds.

So far Indian bonds are not part of any major global bond index. Indian government is working towards seeking its bonds inclusion in global bond indices. Inclusion in the global bond index will attract more inflows by foreign investors into Indian bonds.

12.6.5 Total Return Bond Index

The total return bond index replicates the return from holding the index portfolio. Hence it gives the market value weighted return of the index constituents, taking into account price movements, accrued interest and cash-flows from the bonds (including coupon payments, redemptions or repurchases).

12.7 Stock-Bond (Composite) Indices

Composite indices blend in equities as well as bonds and are useful in evaluating the performance of the portfolio which have exposure to both the asset classes.
The following are the examples of hybrid indices:

The NIFTY Hybrid Index series comprises 6 indices that blend NIFTY 50 TR and the aggregate fixed income indices in various proportions to reflect performance of hybrid portfolios investing in both asset classes.

- The indices are derived from the total return versions of the NIFTY 50 index and fixed income aggregate indices
- Weights of the equity and fixed income sub-indices can drift between monthly reset dates due to underlying asset price movement. These weights are reset to their pre-defined levels on a monthly basis.

Table 12.10: Hybrid Indices

Index Name	Equity Allocation	Debt Allocation
NIFTY 50 Hybrid Composite Debt 70:30 Index	NIFTY 50 70%	NIFTY Composite Debt Index 30%
NIFTY 50 Hybrid Composite Debt 65:35 Index	NIFTY 50 65%	NIFTY Composite Debt Index 35%
NIFTY 50 Hybrid Composite Debt 50:50 Index	NIFTY 50 50%	NIFTY Composite Debt Index 50%
NIFTY 50 Hybrid Composite Debt 15:85 Index	NIFTY 50 15%	NIFTY Composite Debt Index 85%
NIFTY 50 Hybrid Short Duration Debt 40:60 Index	NIFTY 50 40%	NIFTY Short Duration Debt Index 60%
NIFTY 50 Hybrid Short Duration Debt 25:75 Index	NIFTY 50 25%	NIFTY Short Duration Debt Index 25%

Chapter 12: Sample Questions

1. Which of the following is a use of security market Index?
    a. To serve as a benchmark for portfolio performance
    b. To be used for creating passive portfolios like index funds
    c. To be used for measuring systematic risk
    d. All of the above

2. What impact does a stock split have on a price-weighted series?
    a. Index remains the same, divisor will change
    b. Divisor remains the same, index will change
    c. Index and divisor will both remain the same
    d. Index and divisor will both change

3. An example of a value weighted stock market index is:
    a. BSE Sensex
    b. Nifty 50
    c. S & P 500
    d. All the above

4. A criticism of a value weighted index is that
    a. Large companies have small influence on the index
    b. They are not useful for the OTC market
    c. Large companies have a disproportionate influence on the index
    d. Small companies have a large influence on the index

5. Which of the following factors makes it difficult to create and maintain a bond index?
    a. The universe of bonds is broader than stocks.
    b. The universe of bonds is constantly changing due to new issues
    c. It is difficult to derive up-to-date prices of bonds as compared to stocks
    d. All of the above

Sample Caselet

1. An index comprises of three stocks, X,Y,Z, whose annual revenues are in the ratio of 1:2:3, respectively. What would be the percentage change in the factor weighted index between two points of time, if the prices of these three stocks move from Rs. 200, Rs. 400, Rs. 800 to Rs. 400, Rs. 600, Rs. 900, respectively?

   b) 39.58%
   c) 35.98%
   d) 35.89%
   e) 38.59%

   Answer: a) 39.58
   Explanation: (100% * 1/6) + (50% * 2/6) + (12.5% * 3/6) = 39.58%

CHAPTER 13: CONCEPT OF INFORMATIONAL EFFICIENCY

LEARNING OBJECTIVES:

After studying this chapter, you should know about:

- The concept of market efficiency
- Difference between, weak-form of efficiency, semi-strong-form of efficiency and strong-form of efficiency
- Anomalies in capital markets
- Implication of market efficiency on valuation and portfolio management

13.1 Informational efficiency versus Operational Efficiency

Operational efficiency measures the cost of transacting i.e. cost of carrying out trades in the market. Thus, it is concerned with transactions costs. Market is said to become operationally efficient if the cost of transacting in the market is going down.

There has been voluminous research on market efficiency since it has implications on portfolio management as well as on security analysis. Popularly the term market efficiency is used in the context of informational efficiency rather than operational efficiency.

In common parlance, an informationally efficient market is one in which prices always "fully reflect" the most up to date current information. Hence a popular definition of efficient market is one where market price equals fair value of the securities.

In technical terms, an efficient market is one where the market price is an unbiased estimate of the true value of the security. It implies that in an efficient market, price of a security need not be equal to its true value, as long as deviations of the price from the value is random in nature. This means that price can be greater than or less than the value. Randomness means that there is an equal chance that security is under or over valued at any point in time. Further it implies that these deviations are uncorrelated with any observable market variable. This means that no investor should be able to consistently find under-valued or over-valued securities using any investment strategy with the objective of generating abnormal return. For instance, in an efficient market, a stock with a Price Earnings Growth(PEG) of less than 1.0 is no more or less likely to be undervalued than stocks with high PEG ratios. Another example is that no technical indicator would be useful in identifying any undervalued or overvalued stock.

13.1.1 Market price versus value

Market price is the price at which a security is currently available for trading. Investors can buy or sell the security at this price. The market price mimics security's fair intrinsic value (sometimes called fundamental value). Broadly speaking, it is the value that would be placed on the asset by investors if they had a complete understanding of the asset's investment characteristics. For a company's stock, for example, such information would include its financial information like profit margins, sales, financial structure, information about the promoters and the management, Strength Weaknesses Opportunities and Threats (SWOT) analysis of the company, information on the sector to which the company belong and the placement of the company in the sector, its competitive advantages, the nature of the business, information of the macro-economic variables and how they would impact the sector and in turn the company's stock etc. All such information would help in estimating the company's future cashflows and thereby the value of its stock. The word estimate is used because in practice, as intrinsic value can only be estimated but is not known for certain. When market is believed to be efficient by the investor, the market price is taken as a good measure of value. When investors do not believe that the markets are efficient, they try to estimate the intrinsic value of the securities. When they estimate the intrinsic value of the security is different than its market price, the security becomes a candidate for buy or sell with a view to gain abnormal returns i.e. alpha. Whereas when the market is believed to be efficient, trades would take place only for the purpose of liquidity and portfolio rebalancing.

13.2 Efficient Capital markets and Random Walk Theory

The early treatment of efficient market model was based on the Random Walk hypothesis, which contended that changes in security price occurred randomly. The statement that current price of the security fully reflect available information is assumed to imply that successive one-period returns are independent and identically distributed, constituting random walk model.

The early academic work in this area was mainly based on extensive empirical analysis. In 1970 Eugene Fama, formalized the theory and organized the empirical evidences. Fama presented the efficient market hypothesis (EMH) in terms of a fair game model stating that in an efficient market, investors can be confident that the current market price fully reflects all available information about a security. Therefore, the expected return based upon this price is consistent with the risk of the security. Hence by design or by using any investment strategy or tool, investors can't derive above average risk adjusted return. Investors should receive normal returns consistent with the risk they are taking.

In his original article, Fama divided the overall efficient market hypothesis (EMH) and the empirical tests of the hypothesis into three sub hypotheses depending on the information set involved: weak-form EMH; semi strong-form EMH and strong-form EMH.

13.2.1. Weak-form of efficiency

The weak-form EMH assumes that current stock prices fully reflect all historical information such as historical sequence of prices, rates of return, trading volume data etc.. This implies that the current prices are completely independent of the past prices. Hence under weak form of efficiency the investors would gain little from technical analysis. As such current market price contains all prior information and it sufficiently provides information to the future state rather than all prior states combined. This is sufficient to show that under weak form, market prices do follow random walk.

13.2.2. Semi-strong-form of efficiency

The semi-strong EMH form assumes that stock prices fully reflect all historical information as well as all publicly available information such as earnings announcements, dividend announcements, price-to-earnings (P/E) ratios, dividend-yield (D/P) ratios, price-book value (P/BV) ratios, news of corporate restructuring, stock splits, news about the economy, political news etc., The semi-strong hypothesis encompasses the weak-form hypothesis. This hypothesis implies that investors who base their decisions on information after it is public cannot derive above-average risk-adjusted returns.

13.2.3. Strong-form of efficiency

Finally, the strong-form EMH states that prices reflect not just historical and current publicly available information, but insider information, too. The hypothesis encompasses the weak-form hypothesis as well as semi-strong-form hypothesis. This hypothesis contends that no group of investors should be able to derive above-average risk-adjusted rates of return.

13.3. Tests and Results of Efficient Market Hypotheses

The evidence on the EMH is mixed. Some studies have supported the hypotheses stating that capital markets are efficient. Other studies have revealed some anomalies related to these hypotheses.

Studies of market efficiency have uncovered numerous examples of market behaviour that are inconsistent with existing models of risk and return. The following section summarizes some of the anomalies in financial markets, which have led to the development of some of the popular investment strategies. Active portfolio managers use such strategies to derive alpha.

13.4. Market Anomalies

13.4.1. January Effect

In the US market, it is observed that investors tend to engage in tax selling toward the end of the year to book losses on stocks that have declined and buy back the same stocks or to similar stocks after the new year[72]. This leads to downward pressure on stock prices towards the end of November and December and positive pressure in early January. Other investors take

[72] A Tax Loss Trading Rule. Ben Branch. The Journal of Business, 1977, vol. 50, issue 2, 198-207. Date: 1977

advantage of these tax selling by acquiring stocks at lower prices in December and selling them at higher prices in January. Such price patterns are inconsistent with the EMH. US IRS enacted Wash Sale Regulation preventing an investor taking a tax deduction for selling securities using anomalies like above. [73]

13.4.2. The Size Anomaly

Firm size is a major efficient market anomaly. Many researchers have examined the impact of size (measured by total market value) on the risk-adjusted rates of return and concluded that the small firms consistently experienced larger risk-adjusted returns than the larger firms. [74] Such results stand in contradiction to the concept of market efficiency. The construction of small cap portfolio is a direct outcome of size anomaly.

13.4.3. The Value Anomaly

Researchers have found a positive relationship between the book value to price ratio and the future returns on stocks. [75] It has been observed under many research studies that stocks with high book to price ratio have generated superior risk adjusted returns. Such a relationship between available public information on the BV/price ratio and future returns contradicts the efficient market hypotheses. This anomaly is at the heart of the popularity of value investing.

13.5. Implication of market efficiency on Valuation and Portfolio Management

13.5.1. Market Efficiency and Technical Analysis

The weak-form EMH assumes that current stock prices fully reflect all security market information. Technical analysts use technical indicators using past price/rerun/volume data to predict the future price movement. If market is in weak form of efficiency, then analysing past information will not lead to identification of future price movements as past returns are not congruent with future returns. Therefore, one should gain little from using any trading rule which indicates that one should buy or sell a security based on past rates of return or any other past security market data. EMH renders technical analysis completely irrelevant for superior returns.

13.5.2. Market Efficiency and Fundamental Analysis

The semi-strong-form EMH asserts that security prices adjust rapidly and accurately to the release of all public information. Analysts conducting fundamental analysis determine the value of securities based on publicly available information. Therefore, if the market is tested to be in semi-strong form of efficiency, trading on the basis of publicly available information

[73] A wash sale occurs when one sells or trades securities at a loss and within 30 days before or after the sale she/he: Buys substantially identical securities, Acquires substantially identical securities in a fully taxable trade, or Acquires a contract or option to buy substantially identical securities. Internal Revenue Service rules prohibit deducting losses related to wash sales.
[74] https://www.sciencedirect.com/science/article/abs/pii/0304405X81900180
[75] Rosenberg, B., Reid, K. and Lanstein, R. (1985) Persuasive Evidence of Market Inefficiency. The Journal of Portfolio Management, Institutional Investor Journals, 11, 9-16.

will not yield investors the chances of generating superior risk adjusted return considering that securities prices immediately reflect all such new public information.

13.5.3. Internal contradiction in the concept of efficiency

Markets do not become efficient on their own. It is the actions of participants, sensing profit maximizing opportunities and trading on the basis of information using some investment strategy to beat the market that makes markets efficient. Thus, the necessary conditions for a market to become efficient is the belief of the participants that market is not efficient and they can derive superior risk adjusted returns by using some schemes or strategies. This is considered as the internal contradiction in the concept of efficiency. That is to make the market efficient, a large number of profit maximizing participants should seek out opportunities of beating the market based on their belief that market is not efficient. Such internal contradiction promotes prerequisite of a deeper and liquid market for it to be efficient.

13.5.4. Market Efficiency and the rise of index fund

Globally the assets under management (AUM) managed passively through index funds have grown significantly in the recent years. One possible explanation for the popularity of index funds is the concept of market efficiency. In an efficient market, a strategy of minimizing transaction costs would be superior to a strategy which requires frequent trading especially for investors with long term investment horizon. When it is difficult to beat the market, be with the market and reduce the transaction is the premise on which indexing is based on. Minimizing transactions reduces transaction cost and tax implications thus making returns to be better to begin with.

Chapter 13: Sample Questions

1. Which of the following would be inconsistent with an efficient market?

    a. Information arrives randomly
    b. Information arrives independently.
    c. Stock prices adjust rapidly to new information.
    d. Price adjustments are biased.

2. The weak form of the efficient market hypothesis states that _____.

    a. Successive price changes are dependent.
    b. Successive price changes are independent.
    c. Successive price changes are biased.
    d. Successive price changes depend on trading volume.

3. The opportunity to take advantage of the downward pressure on stock prices that result from end-of-the-year tax selling is known as_____.

    a. The New Year's Anomaly.
    b. The December Anomaly.
    c. The End-of-the-Year Anomaly.
    d. The January Anomaly.

4. The implication of efficient capital markets and a lack of superior analysts have led to the introduction of _____.

    a. Life cycle funds.
    b. short extension funds.
    c. January funds.
    d. Index funds.

5. Which of the following statement is False?

    a. Prices in efficient capital markets fully reflect all available information and rapidly adjust to new information.
    b. An efficient market requires a large number of profit-maximizing investors.
    c. If the efficient market hypothesis is true price changes are independent and unbiased.
    d. All the above.

CHAPTER 14: BEHAVIOURAL FINANCE

LEARNING OBJECTIVES:

After studying this chapter, you should know about:

- Difference between Behavioral Finance and Standard Finance
- How do individuals make decisions?
- Different types of biases.

14.1 Behavioural Finance versus Standard Finance

Behavioral Finance is the study of the way in which psychology influences the behavior of market participants, both at the individual and group level, and the subsequent effect on the financial markets. It is a part of Behavioural Economics which deals with biases and cognitive errors affecting investor's investing behaviour. Behavioural Finance makes an attempt to explain the gaps and market anomalies, which are not explained by standard finance theories and frameworks.

Standard finance theories and models are based on certain assumptions. The key assumptions are:

- Investors are rational
- Investors are risk averse
- Investors are self-interested utility maximizers
- Investors update their belief as new information comes in
- Investors have access to all available information

The real life behaviour demonstrated by investors is far from what is assumed in traditional finance models. Some of the examples which we observe in daily life are:

- Instead of diversifying, investors hold concentrated portfolios.
- Instead of making a rationale choice of risk-return, investors show distinct greed and fear over the course of time.
- Instead of accepting randomness with winning investments, investor attribute it to their skills.
- Investors getting confused between a good company and a good stock.
- Investors preferring domestic companies (home bias) because they perceive the risk is low due to familiarity of the company

In other words, the real life investors are very different than those in standard finance theory. Table 14.1 points out salient points about standard and behavioural finance.

Table 14.1: Standard finance versus Behavioural Finance

Standard Finance	Behavioural Finance
Economics at core	Psychology at core
Investors are rational and process new information without any bias. Efficient market hypothesis describes random movement in prices.	Biases (decision making behaviour) guide investments. Every new information is seen with the same lens. Collective bias or herd mentality is responsible for sharp movements.
Decision making is rule driven and consistent under different scenarios.	Decision making is inconsistent given the experience, recency or loss aversion.
Risk-return trade-off is the foundation of investment.	Loss aversion is basis which in turn makes an investor oversensitive to losses.
Decision is rational based on detailed analysis.	Decision is adhoc based on thumb rules.

Nobel laureates Daniel Kahneman (2002) and Richard Thaler (2017) are credited for bringing Behavioural Finance to the forefront and attempts to integrate it with Standard Finance.

14.2 How do individuals make decision?

As discussed above, the process of decision making as envisaged under standard finance theories and the way investors make decision in reality is different. Investors do not act like rational actors as suggested under standard finance theory. They show limits to rationality.

14.2.1 Bounded Rationality

Most investors have limited (i) time and/or (ii) information and/or (iii) ability to comprehend complex information at the time of decision making. Similarly, when selecting one of the many options that requires meticulous analysis incorporating all the available information, people get confused. They settle with an option (possibly sub-optimal), which seems to be satisfactory and sufficient based on quick analysis governed by 'thumb rules'. In other words, instead of optimizing as suggested by theories in finance, investors "satisfice" (seemingly satisfactory and sufficient).

Bounded Rationality, therefore, is the cognitive limitation of mind where in absence of time or complete information, decision making favours satisficing solution (satisficing is combination of satisfactory and sufficient) instead of an optimal (or maximising) one. It is important to note here that bounded rationality is not irrational decision making, but rational decision making under certain boundary conditions.

Nobel laureate Herbert Simon (1978) is credited with the concept of Bounded Rationality. The steps involved in decision making according to Bounded Rationality are:

- Process only the information which is manageable (as against processing all information).
- Rule of thumb or quick approaches are applied while processing, and
- Select solution which is Satisfactory and Sufficient (Satisficing solution).

Bounded rationality, therefore falls between Rationality (decision making process where all available information is processed to arrive at the optimal solution) and intuition (experience).

14.2.2 Prospect Theory

Daniel Kahneman and Amos Tversky (1979) introduced Prospect Theory. It describes how individuals make choices in situations where they have to decide between alternatives that involve risk (e.g. financial decision) and how individuals evaluate potential losses and gains. Prospect theory considers how prospects are perceived based on their framing, how gains and losses are evaluated, and how uncertain outcomes are weighted.
There are two phases of making choices:

- an early phase in which prospects are framed
- a subsequent phase in which prospects are evaluated and chosen.

The framing phase consists of using heuristics to do a preliminary analysis of the prospects. In the second phase, the edited prospects are evaluated and the prospect of highest perceived value is chosen.

To summarize, premises of Prospect Theory are:

- Choices are evaluated relative to a reference point (which is their well-being);
- People are risk-averse about gains (realizing it early) but risk seeking about losses (holding to them longer).
- Monetary losses hurt more than monetary gains.

14.3 Categorization of Biases

Individuals as well as institutions process information based on their experiences and preferences, which in psychology are referred to as biases. Such intentional errors often lead to systematic favouring.

While people desire to follow rational decision making which involves evaluating all the options with all the information available, individual biases hold them from doing so. Rational decisions often get circumstantial. While it is impossible to be unbiased, maintaining discipline and checklists can help in mitigating them.

Broadly, investing biases fall into two main categories: Emotional biases – based on feeling or emotions and Cognitive errors – based on faulty cognitive reasoning.

14.3.1 Emotional Bias

At the time of decision making, individual's feeling or emotions occur spontaneously which is a result of deep-rooted personal experiences. It is important to note here that emotional bias does not mean making errors. On the contrary, it has an underlying of being protective and taking suitable and comfortable decision for oneself.

Following are some of the emotional biases:

Loss Aversion Bias

People prefer taking chances for avoiding losses. However, they do not like taking chances with certain gains. Losses are significantly more powerful than gains. Shefrin and Statman (1985) proposed Disposition Effect for holding "losers" too long and selling "winners" too early. They noted that "people dislike incurring losses much more than they enjoy making gains, and people are willing to gamble in the domain of losses." Consequently, "investors will hold onto stocks that have lost value and will be eager to sell stocks that have risen in value."

Stereo Typing Bias

Investors, while dealing with uncertainties, look for representative characteristics and base their decisions on the general perception about those characteristics. For example, belief that a high-profile manager is equals with a better managed company and that makes good investments, is a stereo type bias.

Overconfidence Bias

Overconfidence Bias is a bias in which people demonstrate unwarranted larger faith in their own intuitive reasoning, judgments and cognitive abilities. Most people rate themselves better than average in their skills, expertise, knowledge etc. With illusion of superior knowledge, overconfidence bias is intensified when combined with self-attribution bias, where people confuse brain with bull market. Overconfidence often results in underestimating the losses. This unwarranted confidence often leads to sub-optimal decisions in investments. Overconfidence leads to misguided conviction and often blurs the difference between skill and luck. Even the feedback loop in such cases further fuels the overconfidence bias and investor easily gets swayed away from risk-return trade off principles. Some of the observed behaviour of overconfidence bias are visible in portfolio concentration, sector or country bias, excessive trading, sticking with loss making stocks in sectors which investor believes to know more etc.

Endowment Bias

Endowment Bias is an emotional bias in which people value an asset more when they hold rights to it than when they do not. When the investor believes that the stock(s) she owns is more valuable than others and when the market will recognise, she would make superior returns. Endowment bias has two attributes: valuing ownership and loss aversion. It has been

generally observed that inherited stocks are rarely sold even if they do not fit in overall investment strategy.

Status Quo Bias

When an individual has second thoughts or want to avoid regrets in decision making, she/he ends up taking no decision at all and maintaining status quo. Status Quo Bias is closely linked to Regret Aversion bias in which people tend to avoid making decisions that will result in an action out of fear that the decision will turn out poorly.

Regrets have two dimensions –

- actions that people take (Error of commission)
- actions that people could have taken (Error of omission)

Regret is more intense due to error of commission than omissions and hence people prefer the status quo. Sometimes complexity in understanding or execution also leads to status quo. A simple nudge, as explained by Richard Thaler, resulted into employees enrolling for pension plans, which otherwise had poor enrolment only due to status quo bias.

14.3.2 Cognitive Errors

Cognitive errors are statistical, information-processing or memory errors that cause a person to deviate from rational behaviour. Cognitive errors result from reasoning based on faulty thinking whereas emotional biases result from reasoning influenced by feelings. Depending on thumb rules instead of doing exact calculations, is an example of cognitive bias. People are less likely to make cognitive errors if they remain vigilant. Unlike emotional bias, cognitive biases can be considered as short-cut approach to decision making where one avoids going through the pains of analysing and evaluating options. And at times, can be factually incorrect.

Mental Accounting

Mental Accounting Bias is an information processing bias in which people treat one sum of money differently from another equal-sized sum based on which mental account the money is kept. The concept of mental accounting was developed by Richard Thaler in 1999[76].People code, categorize and evaluate economic outcomes by grouping their assets into any number of non-fungible[77] mental accounts. When people keep mental accounts, they treat money less fungible that it really is which often leads to sub optimal decisions. People link their spending to specific budgets. They are willing to take more risk with money that is perceived as windfall gain or lottery winnings. People end up spending their non-regular income extravagantly. The treatment of salary income differently from tax refunds and bonus amount etc., lead to irrational spending.

[76] According to the theory of mental accounting, people treat money differently, depending on factors such as the money's origin and intended use, rather than thinking of it in terms of the "bottom line" as in formal accounting (Thaler, 1999).
[77] Fungibility is the fact that all money is interchangeable and has no labels.

Thaler recommended that people should consider money as fungible and treat all money the same, regardless of its origin or use.

Investors think about their wealth as if it consists of various buckets e.g. retirement fund, children's education and marriage etc. It mentally helps them to keep a tab on it. This often results into selection of assets under each bucket, which could have been avoided by the investor on a broader level if they consider their overall investments together and work towards optimizing portfolio.

Framing

Framing Bias is an information-processing bias in which a person answers a question differently based on the way in which it is asked (framed). An investor's choices will be influenced by how information or facts are presented. Different types of framing approaches have been identified, including risky choice framing (e.g. the risk of losing 10 out of 100 lives vs the opportunity to save 90 out of 100 lives), attribute framing (e.g. product that is 0% fat vs 100% fat free). As can be seen, the outcomes of both the choices in both the scenarios is the same, however people mostly opted for second options in both the scenarios.

Prospect theory describes how individuals make decision when they have to decide between choices that involve risk (e.g., financial decisions) and how individuals evaluate potential losses and gains. Prospect theory considers how prospects (alternatives) are perceived based on their framing, how gains and losses are evaluated, and how uncertain outcomes are weighted.

Investors have to recognize this bias while filling risk tolerance questionnaire for the purpose of determining the risk appetite as that would influence the asset allocation choices greatly. Also, at the time of evaluating the performance of the portfolio, decision making frames may lead to sub-optimal judgments.

Anchoring

Anchoring bias occurs when people rely on pre-existing information when they make decisions. Most of the investors anchor their investment around some initial information, which they so heavily relied upon. This makes all the subsequent information to be seen in light of the anchor information. For example, during negotiations, it is often observed that the first price mentioned becomes anchor price during the entire negotiations. Making a judgement about where the prices of the stock could be on the basis of its past performance is another example of anchoring.

14.4 Fusion Investing

Fusion Investing integrates traditional and behavioural paradigms to create investment strategies. It attempts to combine fundamental analysis with behavioural finance. On one hand, fundamental style of investing suggests that stock price is the discounted value of future cashflows and all company related information is fully reflected in the stock price. But on the other hand, we observe volatile stock prices in short-term, which shows that short-term price is influenced by collective behaviour of investors or traders.

In the words of Benjamin Graham, the father of value investing style, "in the short run the market is a voting machine, and in the long run it is a weighing machine" tells the stark combination of biases and fundamentals. Fusion investing can be seen as integration of both the voting and the weighing machine. Fusion investing, therefore, combines value-growth phenomenon from fundamental investing and the momentum effect from behavioural finance.

Portfolio manager ought to understand that inefficiencies existing in market is an attempt to exploit this inefficiency. Broad Steps involved in identifying stocks which comprise both value-growth and momentum are:

Step I: Identify stocks (from the universe of stocks) which are showing promise on value terms i.e. P/E, P/BV, P/S.
Step II: Filter from step I, stocks which are fundamentally strong i.e. profitability, leverage and efficiency parameters (e.g. Piotroski Score) on historical as well as based on earnings forecast. [78]
Step III: From the stocks, which are filtered after step II, identify stocks, which are showing strong momentum i.e. price uptrend

These stocks, which are left after step III shall qualify to be part of the portfolio. While, intuitively it seems to be a good strategy, market data is insufficient to conclusively prove the same. Moreover, momentum, which is captured through step III is short-term phenomenon and would require rebalancing at a much shorter periodicity as compared to the value-growth parameters. This means transaction cost will play a critical role in determining overall return on the portfolio. Taxation policy also needs to be considered in such a rebalancing process.

[78] The Piotroski score is a discrete score between 0-9 that reflects nine criteria used to determine the strength of a firm's financial position. The Piotroski score is used to determine the best value stocks, with nine being the best and zero being the worst. The Piotroski score was named after Chicago Accounting Professor Joseph Piotroski, who devised the scale, according to specific aspects of company financial statements.

14.5 Behavioural Finance and Market Anomalies

14.5.1 Market Anomalies

Market anomaly, in simple terms, is departure of stock price from its expected value given its fundamentals. A market anomaly may be present if a change in the price of an asset or security cannot be explained by the current relevant information known in the market or to the release of new information into the market. Empirical research show that the actual returns deviate from the expected return as required by Capital Asset Pricing Model (CAPM) or other asset pricing models. These gaps are referred as anomalies. Anomalies appear, disappear and reappear quite randomly. It is expected that such anomalies disappear as others would try to profitably exploit them. While some anomalies do disappear, there are others, which persist for much longer period.

Behavioural biases may cause investors to make systematic mistakes when they invest, and those mistakes create anomalies in the market. Biases like overconfidence make investors underestimate risks. Under self-attribution bias, investors tend to take credit for successes and blame others for failures. They follow information that supports their beliefs and disregard conflicting information. These biases may cause investors to trade too often. Disposition effect where investors hold on to losers longer and sell winner faster explains momentum in prices.

14.5.2 How Behavioural Finance explains Bubbles and Crashes

Charles Kindleberger in his book 'Manias, Panics and Crashes (1978)' describes Bubbles as a sharp rise in asset price in a continuous process with the initial rise generating expectations of further rises and attracting new buyers, generally speculators, interested in profit from trading rather than investing for long term. In his view psychology is as important as finance and economics in explaining such behaviour in the financial market.

When an asset is mispriced, rational arbitragers would exploit it to their advantage and soon such mispricing will disappear. However, arbitrageurs suffer from synchronisation problem (in order to attain a coordinated selling strategy) besides difference in individual incentives to time the market during bubble and crash phases. And this leads to persistence of bubbles to a longer period.

Some of the notable examples of bubbles and crashes are: Dutch Tulip mania of 1630s, South Sea Bubble of 1729-30 and Tech bubble of 2000. Kindleberger notes that even Isaac Newton tried to ride the South Sea Bubble in 1720. He got out of the market at GBP 7,000 after making a profit of GBP 3,500, but he decided to re-enter it thereby losing GBP 20,000 at the end. Frustrated with his experience, he concluded, "I can calculate the motions of heavenly bodies, but not the madness of people".

Historically, bubbles have often emerged during structural change in productivity e.g. Railway boom, Electricity Boom, Technology Boom etc.. Bubbles typically begin with a justifiable rise in asset price (due to new product, new idea, disruption etc.) given rise in productivity or prosperity. Such productivity or prosperity changes expectations about future. Early investors, in such themes, make very high returns which start attracting new investors. Cheap borrowing costs fuel bubbles as more and more new buyers chase the asset. Bubble phase takes share prices to unrealistic levels and analysts come out with 'new age' theories to justify such prices.

Some of the potential reasons for such bubbles are:
Liquidity: Liquidity chasing stocks lift stock prices. Cheaper borrowing and investing further fuels. Those who are sellers, invest in other assets, which create a vicious cycle of price rise. And each round raises price to next level.

Celebrity status: Celebrity status is self-fulfilling. Media promotes celebrity and its cult. Likewise, media promoted tech-boom. This results into disconnect between value and price (or say, earnings capability and value).

Momentum: Research suggests that investors extrapolate uptrend (or downtrend) with their positive (or negative) feedback on asset price. If this extrapolative expectation is widespread, it results in herd trading. Herd trading overcomes rational interventions (by rational investors who take contrary position knowing that asset is mispriced and needs to get corrected).

Illusion of Control: Familiarity, access to information, active involvement etc. give rise to the illusion of control over the stock price. This leads to believing that investor can forecast prices and will be able to sell before others, hence avoid losses.

Keith Redhead (2008) writes in the report that speculative bubbles are more likely to emerge where:

- Proportion of unexperienced traders is high;
- Uncertainty about true value is high;
- Investment promises small chance of profit but the amount of profit is very high;
- It is possible to finance purchases by borrowing money;
- Short selling is difficult (difficult to borrow shares for the purpose of selling them).

Crashes entails similar processes like bubbles, but in reverse order and everyone comes to sell at the same time. Negative news, change in opinion, liquidity crunch, return to fundamental pricing models etc. makes every investor or trader to liquidate their position before anyone else. Such jostling among investors/traders to get rid of stock leads to crashes.

Chapter 14: Sample Questions

1. Anchoring bias occurs when people rely on
   a) pre-existing information when they make decisions
   b) collect all available information when they make decisions
   c) do not make use of any information when they make decisions
   d) make forecast about the future prospects

2. According to _____ people treat money differently, depending on factors such as the money's origin and intended use
   a) Capital market theory
   b) Modern portfolio theory
   c) Prospect theory
   d) mental accounting theory

3. The following is the premise of Prospect Theory:
   a) Choices are evaluated relative to a reference point (which is their well-being);
   b) People are risk-averse about gains (realizing it early) but risk seeking about losses (holding to them longer)
   c) Monetary losses hurt more than monetary gains
   d) All the above

4. Daniel Kahneman and Amos Tversky (1979) introduced _____.
   a) Capital market theory
   b) Modern portfolio theory
   c) Prospect theory
   d) mental accounting theory

5. Behavioural finance differs from the standard model of finance because behavioural finance
   a) Precludes the impact of investor psychology.
   b) Includes the impact of investor psychology.
   c) Accepts the Efficient Markets Hypothesis.
   d) Rejects the idea of market anomalies.

CHAPTER 15: INTRODUCTION TO MODERN PORTFOLIO THEORY

LEARNING OBJECTIVES:

After studying this chapter, you should know about:

- The framework for constructing and selecting portfolios
- Calculation of risk and return of individual asset/security
- Calculation of risk and return of a portfolio of assets/securities
- Benefits of diversification

15.1 Framework for constructing portfolios - Modern Portfolio Theory

Conventional wisdom has always dictated not putting all the eggs in one basket. This adage is addressing the benefits of diversification. Prior to 1950, investing community was familiar with the benefits of holding a diversified portfolio. However, they had no way of quantifying the benefits of diversification.

In 1952, the Journal of Finance published an article titled "Portfolio Selection", authored by Harry Markowitz. Decades later in 1990, Harry Markowitz was honoured with the Nobel Prize in Economics for his 'Portfolio Theory'. The ideas introduced in this article have come to form the foundations of what is now popularly referred as Modern Portfolio Theory (MPT). In simple words, MPT provides a framework for constructing and selecting portfolios based on the expected performance of the investments and the risk appetite of the investor. MPT quantified the concept of diversification by introducing the statistical notion of covariance, or correlation between investment assets. Harry Markowitz mathematically demonstrated that the variance of the rate of return is a meaningful measure of portfolio risk. He derived the formula for computing the variance of a portfolio, showing how to effectively diversify a portfolio.

15.2 Assumptions of the theory

Some of the assumptions of the Modern Portfolio Theory (MPT) are as under:

- An investor wants to maximize the return for a given level of risk. That means given a choice between two assets with equal rate of return, investors will select the asset with lower risk.
- Investors consider each investment alternative as being presented by a probability distribution of expected returns over some holding period.
- Investors maximise one-period expected utility. Investors choose an action or event with the maximum expected utility. Investors assign utility scores to the various portfolio choices available to them.
- Investors base decisions solely on expected return and risk.

- Investors estimate the risk of the portfolio on the basis of the variability of expected returns of constituent assets.

15.3 Definition of risk averse, risk seeking and risk neutral investor

The presence of risk means that more than one outcome is possible. Investors demand risk premium for bearing the risk. The question whether a given risk premium is adequate is a central theme in investment management. Measurement of risk and determination of risk premium is an important area of work in finance.

Risk averse investors will invest in risk-free investment opportunities or in investment opportunities with positive expected risk premium. The greater the risk, greater the demand for risk premium. Investors assign utility score to competing portfolios given their expected return and risk involved. Utility scores are assigned to those portfolios for their risk-return profile. Higher utility scores are assigned to portfolios with higher expected return and lower risk, and lower utility scores are assigned to portfolios with higher risk and lower returns. A function commonly used by financial experts assigns a portfolio with expected return E(r) and variance of the return the following utility score:

$$U = E(r) - \tfrac{1}{2} A\sigma^2$$

Where: U is the utility value, A is an index of investor's risk aversion. σ^2 is the variance of the returns of the investment. Say for instance an investor has a risk aversion index of 3 and is evaluating an investment alternative that generates an expected return of 15%, with a variance of 10%. The ongoing risk free rate of return is 8%. Then to decide to invest or not, the investor can calculate the Utility score as follows:

U = 0.15 - (0.5 * 3 * 0.10 * 0.10) = 0.135 or 13.5% OR to avoid the usage of decimal forms of returns and variance the ½ (scaling convention) can be adopted as 0.005 and the values of returns and variance can be used without the percentage decimal form as follows to get the direct Utility answer.

U =15 – (0.005 * 3 * 10 *10) = 13.5%

Now typically an investor would compare this Utility with the risk free rate of return, because that is the comparable risk free investment. In the above, case we have assumed that the ongoing risk free rate of return is 8%, and therefore the excess Utility is 13.5% - 8% = 5.5%. Because Utility of the investment is greater than the risk free rate of return, the investor should choose this investment. It may be noted that the above equation supports the thought process that utility is enhanced by expected return and reduced by risk. The return generated by a particular investment alternative is penalised for the risk involved according to the unique risk aversion of the investor. Therefore, Utility is indirectly measuring the risk free

return of that investment. So, logically, if Utility is greater than the risk free rate, the investment is worthwhile investing.

It is interesting to note that Utility is not like risk reward ratio or Sharpe Ratio, which also measures the excess return of a portfolio over its risk. In the risk to reward ratio or Sharpe Ratio, there is no involvement of investors' risk aversion. It goes by the assumption that every investor is similar and their risk perceptions about an investment are homogenous. Therefore higher the Sharpe Ratio better the investment is. But in the practical world, a good portfolio or investment is not equally attractive to all the investors. What explains this heterogeneity? The answer to this question is Utility that explains that it is the unique individual risk aversion, which makes investors differ in their choices.

15.4 Expected rate of return for individual security

Expected rate of return of an individual investment opportunity is the sum of the expected returns multiplied with their corresponding probabilities. Such a return is also known as Ex-Ante Return. Returns which are calculated based on historical data are called as Ex-Post Returns.

Suppose the following returns are forecasted for stocks A and B in the three possible scenarios (Table 15.1):

Table 15.1 Expected rate of return for a security

	State	**Probability**	**A**	**B**
I	Boom	0.3	15%	25%
II	Normal	0.5	10%	20%
III	Recession	0.2	2%	1%

The expected return of these two stocks will be calculated as follow:

$R_A = 0.3(15\%) + 0.5(10\%) + 0.2(2\%) = 9.9\%$
$R_B = 0.3(25\%) + 0.5(20\%) + 0.2(1\%) = 17.7\%$

15.5 Variance of return for individual security (Ex-Ante Risk)

Risk of investing in an asset is defined as the variability in its return. One of the best-known measures of risk is standard deviation of expected returns (square root of variance of expected returns). It is a statistical measure of the dispersion of returns R_i around the expected value $[E(R_i)]$. Larger variance (larger standard deviation) indicates greater dispersion, hence larger risk.

$$\text{Variance } (\sigma^2) = \sum_{i=1}^{n} [R_i - E(R_i)]^2 P_i$$

where P_i is the probability of the possible rate of return, R_i

The calculation of Variance of an individual security is shown below in Table 15.2: The square root of this measure is known as Ex-Ante Risk.

Table 15.2: Variance of an expected rate of return for a security

Return of a security in a particular state of forecast Ri	**Expected Rate of Return E(Ri)**	**Ri-E(Ri)**	**$(Ri-E(Ri))^2$**	**Probability of a particular state (p)**	**$(Ri-E(Ri))^2$ *P**
8%	11%	-3%	0.0009	0.25	0.000225
10%	11%	-1%	0.0001	0.25	0.000025
12%	11%	1%	0.0001	0.25	0.000025
14%	11%	3%	0.0009	0.25	0.000225
			Variance as an aggregate of the last column →		0.0005

Expected Rate of Return = (8% * 0.25) + (10% * 0.25) + (12% * 0.25) + (14% * 0.25) = 11%

Ex-Ante or Expected Variance (σ^2) = 0.00050

Ex-Ante or Expected Standard Deviation (σ) = 0.0224 or 2.24% (Square Root of Variance)

15.6 Expected rate of return for a portfolio: (Ex-Ante Return)

Expected rate of return for a portfolio of assets is the weighted average of the expected rates of return for the individual investments in the portfolio.

$$E(R_{pori}) = \sum_{i=1}^{n} W_i R_i$$

where :

W_i = the percent of the portfolio in asset i

$E(R_i)$ = the expected rate of return for asset i

The calculation of the portfolio return is shown below in Table 15.3.

Table 15.3: Calculation of Portfolio Return with 4 assets in it.

Weight of Asset in portfolio	Expected Return of the Asset	Weighted investment Return
0.2	0.09 or 9%	0.018
0.1	0.12 or 12%	0.012
0.3	0.15 or 15%	0.045
0.4	0.18 or 18%	0.072
	Expected Return of the Portfolio	0.147 or 14.7%

15.7 Variance of return for a portfolio

Harry Markowitz derived the variance of a portfolio investment by using the statistical notions of covariance or correlation. Box 15.1 explains the difference between covariance and correlation.

Box 15.1: Covariance or Correlation

Covariance is a measure of the degree to which two variables "move together" relative to their individual mean values. For two assets, i and j, the covariance of rates of return is defined as:

$$\text{Cov}_{ij} = \sum_{i=1}^{n} [R_i - E(R_i)][R_j - E(R_j)]/n$$

The correlation coefficient is obtained by standardizing (dividing) the covariance by the product of the individual standard deviations.

$$r_{ij} = \frac{\text{Cov}_{ij}}{\sigma_i \sigma_j}$$

where :

r_{ij} = the correlation coefficient of returns

σ_i = the standard deviation of R_{it}

σ_j = the standard deviation of R_{jt}

Correlation coefficient varies from -1 to +1. A value of +1 would indicate perfect positive correlation. This means that returns for the two assets move together in a completely linear manner. A value of –1 would indicate perfect negative correlation. This means the returns of the two assets move in opposite direction.

Markowitz derived the general formula for the risk of the portfolio returns as follows:

$$\sigma_{port} = \sqrt{\sum_{i=1}^{n} w_i^2 \sigma_i^2 + \sum_{i=1}^{n} \sum_{i=1}^{n} w_i w_j Cov_{ij}}$$

where :

σ_{port} = the standard deviation of the portfolio

W_i = the weights of the individual assets in the portfolio, where weights are determined by the proportion of value in the portfolio

σ_i^2 = the variance of rates of return for asset i

Cov_{ij} = the covariance between the rates of return for assets i and j,

where $Cov_{ij} = r_{ij}\sigma_i\sigma_j$

As can be seen, portfolio risk takes into consideration the weights of every investment in the portfolio, their individual risks (standard deviation) and the correlated risks between each pair of constituent assets.

In other words, variables which affect the portfolio risk are:

1. weights of investments
2. risk of investments
3. co-movement between investments

15.7.1 Risk for two Asset Portfolio

For a two assets portfolio, the portfolio variance formula will be:

$$\sigma_{port}^2 = w_1^2\sigma_1^2 + w_2^2\sigma_2^2 + 2w_1w_2r_{1,2}\sigma_1\sigma_2$$

As can be observed, portfolio variance is a function of weighted averages of the individual variances (where weights are squared) plus the weighted co-variances between all the assets in the portfolio.

In a two investments portfolio, there are three terms in the portfolio variance formula. The first term is weighted variance of investment 1, the second term is the weighted variance of investment 2, and the third term is the weighted covariance between investment 1 and 2.

Table 15.4: Portfolio Risk Calculation for two securities

Correlation coefficient between the returns of Security A and B	0.50
Expected Return on Security A	0.15
Standard Deviation of return of Security A	0.05
Expected Return on Security B	0.15
Standard Deviation of return of Security B	0.05
Weight of security A	0.50
Weight of security B	0.50

Portfolio Variance

$$\sigma^2_{\text{port}} = w_1^2\sigma_1^2 + w_2^2\sigma_2^2 + 2w_1w_2r_{1,2}\sigma_1\sigma_2$$

$$\sigma^2_{port} = (.50^2 X\ 0.05^2) + (.50^2\ X\ 0.05^2) + (2\ X.50\ X.50\ X.5\ X\ .05\ X\ .05)$$

$$\sigma^2_{port} = 0.001875$$

$$\sigma_{port} = 0.0433$$

15.7.2 Risk of three securities portfolio

In a three investment portfolio, there would be six terms – The first term is weighted variance of investment I, the second term is the weighted variance of investment II, the third term is the weighted variance of investment III, the fourth term is the weighted covariance between investment I and II, the fifth term is the weighted covariance between investment II and III, and the sixth term is weighted covariance between investment I and III.

Similarly, in a 50 investments portfolio, there would be 50 individual investments' weighted variances and 1125 weighted covariances between 50 investments.

The number of covariance terms is arrived by using the formula: $\frac{n^2-n}{2}$

where n is the number of securities in the portfolio.

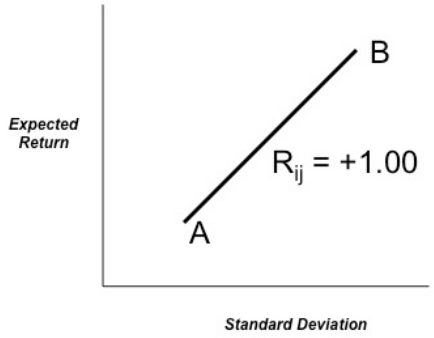
15.8 Graphical presentation of portfolio risk/return of two securities

If two securities are perfectly correlated, all the possible combinations of these two assets are represented by a straight line connecting the returns of these securities on a graph where the returns are plotted on the y-axis and risks on the x-axis. The line contains portfolios of these two investments formed by changing the weights of each security invested in the portfolio.

The graph in Exhibit 15.1 clearly depicts that there was no possibility to create a portfolio, that generates a higher return than that of security B, or a lower risk than that of security A.

Indirectly conveying that there is no benefit due to combining them in any proportion. It also means that there was no possibility for risk diversification when two assets having perfect positive correlation between them are combined to form a portfolio. This is a very fundamental understanding in the Modern Portfolio Theory.

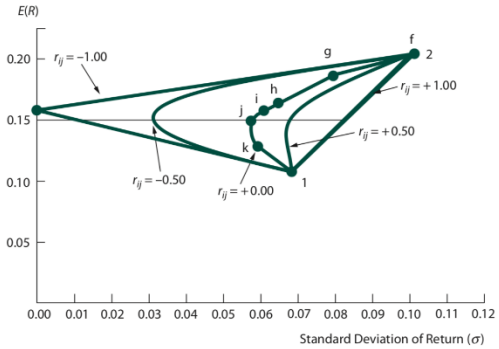
Exhibit 15.1: Risk-return plot for a two securities portfolio



Now let us examine what happens when correlation between the two securities is less than 1. If the two securities are not perfectly correlated, the portfolio's risk is less than the weighted average risk of the securities, and the portfolio formed from the two securities bulges to the left as shown by the curves with the correlation coefficient (ρ) less than 1.0. With low (less than +1 correlation) or negative correlation it is possible to derive portfolios that have lower risk than either of the assets. This is the essence of diversification. As long as the correlation is less than perfect 1, benefits of diversification occurs. Lower the correlation, higher the benefits of diversification.

Exhibit 15.2 demonstrates the portfolio risk–return plots for different weights when ri,j = +1.00; +0.50; 0.00; −0.50; −1.00

Exhibit 15.2: Risk-return plot for a two securities portfolio (with different correlation assumptions)



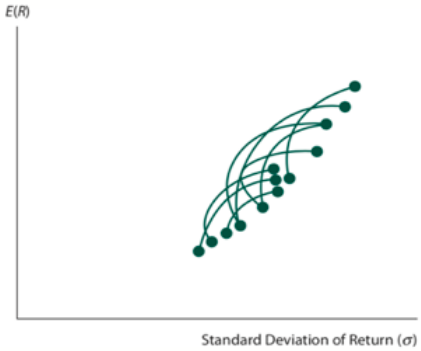
As can be noted in the graph in Exhibit 15.2, when the correlation between the two assets is -1, the complete benefits of diversification is realized. The negative correlation term is

completely offsetting the combined variances terms. Hence, a unique combination of such perfectly negatively correlated securities could yield a zero risk portfolio. As noted, the benefit of diversification is critically dependent on the correlation between assets.

15.9 Efficient Frontier

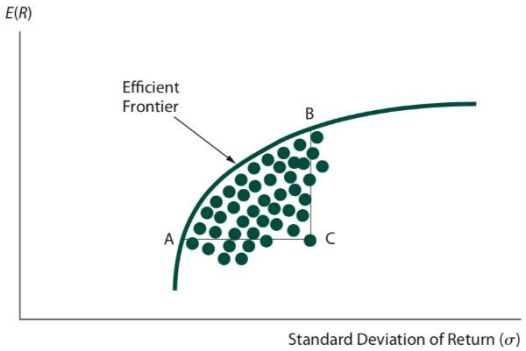
The risk/return of a portfolio with above two securities can be plotted for all the possible weight combinations. When the correlation between them is less than perfect 1, the various combinations of them get plotted on a curve (Exhibit 15. 3).

Exhibit 15.3 Possible portfolio combinations of two Securities



Similarly, many more securities can be combined in various (theoretically infinite) combinations and can be plotted accordingly. Of the various combinations, the one that offer highest return for a given level of risk or the lowest risk for a given level of return will appear to be like an umbrella shaped curve. This umbrella shaped curve is referred as Efficient Frontier (Exhibit 15.4).

Exhibit 15.4: Efficient frontier



The efficient frontier represents set of portfolios that provides maximum rate of return for a given level of risk or the minimum risk for a given level of return. As can be seen in the above graph every portfolio that lies on the efficient frontier has highest possible rate of return for a given level of risk. For example, portfolio A stands on efficient frontier as against portfolio

C, because portfolio C has the same rate of return of portfolio A but much higher risk. Similarly portfolio B also stands on the efficient frontier, because it has a higher return than C, with the same risk.

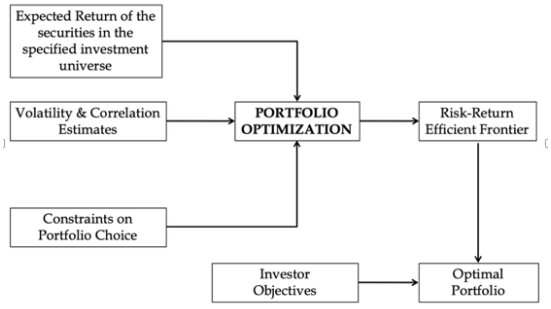
15.10 Portfolio Optimization process

An optimum portfolio is a combination of investments having desirable individual risk–return characteristics for a given set of constraints. For using the Modern Portfolio Theory framework for constructing and selecting the portfolio, the portfolio manager is required to estimate the following:

1. the expected return of every asset class, securities and investment opportunities which are part of investment universe.
2. the standard deviation of each asset's expected returns.
3. the correlation coefficients among the entire set of asset class, securities and investment opportunities, taking a pair of them at a time.

In addition to these inputs, if the investor has any constraints, the same also needs to be specified. Exhibit 15.5 illustrates the portfolio optimization process.

Exhibit 15.5: Portfolio Optimization process



From the feasible combinations of the various portfolios, the one which meets the investment objectives of the investor can be selected.

15.11 Estimation issues

For constructing and selecting a portfolio, the portfolio manager has to estimate the returns, risk and correlations among the securities in the investment universe. It is important to bear in mind that the output of the portfolio allocation depend on the accuracy of the statistical inputs. As can be noted, the number of correlation estimates can be significant. For example,

for a portfolio of 50 securities, the number of correlation estimates is 1225.[79] The potential source of error that arises from these estimations is referred to as estimation risk.

Calculation of portfolio risk comprising of more than two securities can be performed in ways similar to how two securities portfolio risk is calculated. Portfolios with more number of securities will require calculation of variance-covariance matrix. There are several methods for calculating the variance-covariance matrix. It can be easily calculated on the spreadsheet or visual basic application. Reader are advised to refer textbook in financial modelling to understand the same.[80]

[79] $(n^2-n)/2$

[80] Chapter 10, Calculating the variance covariance matrix, Financial Modelling by Simon Benninga

Chapter 15: Sample Questions

1. If a portfolio is comprised of two stocks, and if the correlation coefficient between two stocks were to decrease over time everything else remaining constant the portfolio's risk would _____.

   a. Decrease.
   b. Remain constant.
   c. Increase.
   d. Fluctuate positively and negatively.

2. Given a portfolio of stocks, the envelope curve containing the set of best possible combinations is known as the _____.

   a. Efficient Frontier.
   b. Utility curve.
   c. CML
   d. SML

3. A portfolio is considered to be efficient if:

   a. No other portfolio offers higher expected return with the same risk.
   b. No other portfolio offers lower risk with the same expected return.
   c. There is no portfolio with a higher return.
   d. Both a and b

4. As a portfolio manager you are evaluating to add another security to the portfolio. The correlations of the prospective 4 securities, with the existing portfolio are given below. Which security would you choose if your objective is highest level of risk diversification?

   a. 0.0
   b. 0.25
   c. -0.35
   d. -0.85

5. Investors expecting higher return for higher risk are:

   a) risk seekers
   b) risk neutral
   c) risk averse
   d) all of the above

Sample Caselet

1. Boom, Normal, and Recession are expected to occur with the probabilities of 55%, 35%, and 10%, in the coming year. In Boom, securities A and B can generate an annual return of 25%, 23%. In Normal, 19%, 17%, and in Recession, 13% and 11% respectively. What should be the proportions in which a fund manager need to invest in A and B to generate an expected return of 20% from the portfolio?

a) 15% and 85%
b) 20% and 80%
c) 50% and 50%
d) 40% and 60%

Answer: a) 15% and 85%
Explanation: Arrive at ex-ante returns of A and B as 21.7 and 19.7 from the given data. Then assuming weight of A as 'x' and weight of B as (1-x), equate the weighted average return to 20.

2. A fund manager invested 15% and 85% of the fund in stocks A and B respectively. They are expected to generate ex-ante returns of 21.7% and 19.7% for the coming year. The correlation coefficient of returns of the securities is 0.4 and their standard deviations are 4.01% each. What is the risk of the portfolio?

a) 3.69%
b) 3.46%
c) 4.01%
d) 4.25%

Answer: a) 3.69%
Explanation: Use Markowitz model to arrive at the Portfolio Variance and then take the square root of the same.

3. A fund manager invested 15% and 85% of the fund in stocks A and B respectively. They are expected to generate ex-ante returns of 21.7% and 19.7% for the coming year. The risk of the portfolio is 25%. What is the utility of this portfolio to the investor, and would she pick it up if her risk aversion index is 5 and the risk free rate of return is 6%?

a) 4.38%, No
b) 4.83%, Yes
c) 10%, No
d) 12.5%, Yes

Answer: a) 4.38%, No
Explanation: Use the portfolio return of 20% and portfolio risk of 25% with the Utility formula, 0.2 - (0.5*5*0.25*0.25). If the Utility is greater than risk free rate, one would invest.

4. A fund manager invested 15% and 85% of the fund in stocks A and B respectively. Their market beta is 1.2 and 1.5 respectively. If the expected risk free rate of return is 6% and the relevant market risk premium is 10%. Then what can be the expected rate of return of this portfolio, if the markets are efficient?

a) 20.55%
b) 21%
c) 18%
d) 20%

Answer: a) 20.55%
Explanation: Use Portfolio beta as a weighted average beta (0.15*1.2) + (0.85*1.5) = 1.455. Then using CAPM approach the expected return is 6% + (1.455 * 10%) = 20.55%

CHAPTER 16: INTRODUCTION TO CAPITAL MARKET THEORY

LEARNING OBJECTIVES:

After studying this chapter, you should know about:

- Types of risk – market and non-market risk
- Capital Market Line
- Securities Market Line
- The concept of market portfolio
- Calculation of required rate of return

16.1 Introduction to Capital Market Theory

Capital market theory builds on Modern Portfolio Theory(MPT) and develops a model for pricing all risky assets. Capital market theory expands the concepts introduced by Markowitz's Portfolio Theory by introducing a risk-free asset while forming efficient portfolios of risky assets. The availability of risk free asset has significant implications on portfolio choices.

A fundamental question in finance is how the risk of an investment should affect its expected return. The Capital Asset Pricing Model (CAPM) provided the first coherent framework for answering this question. CAPM is a dominant model for the valuation of risky asset and estimation of required rate of return. It was developed in the early 1960s concurrently by four individuals William Sharpe (1964), Jack Treynor (1962), John Lintner (1965) and Jan Mossin (1966).

16.2 Assumptions of Capital Market Theory and the implication of relaxing these assumptions:

As Capital Market Theory builds on Modern Portfolio Theory, all the assumptions of MPT hold for capital market theory with some additional assumptions. The following section discusses the assumptions of capital market theory, along with the implication on the theory when some of these assumptions are relaxed.

- All investors are Markowitz efficient investors who want to target points on the efficient frontier. The exact location on the efficient frontier and, therefore, the specific portfolio selected, will depend on the individual investor's risk-return utility function.
- Investors can borrow or lend any amount of money at the risk-free rate of return (r_f). Practically, it is always possible to lend money at the nominal risk-free rate by buying risk-free securities such as government t-bills. It is not possible to borrow at this risk-

free rate. Investors rate of borrowing in a practical world is higher than the risk free lending rate. However, assuming a higher borrowing rate does not change the general results.

- All investors have homogeneous expectations i.e. they estimate identical probability distributions for future rates of return. This assumption can be relaxed. As long as the differences in return expectations are not large, the effects are minor.
- All investors have the same one-period time horizon such as one-month, six months, or one year. The model will be developed for a single hypothetical period, and its results could be affected by a different time horizon assumption. A difference in the time horizon would require investors to derive risk measures and risk-free assets that are consistent with their time horizons.
- All investments are infinitely divisible, which means that it is possible to buy or sell fractional shares of any asset or portfolio. This assumption allows us to discuss investment alternatives as continuous curves. Changing it would have little impact on the theoretical models.
- There are no taxes or transaction costs involved in buying or selling assets. This is a reasonable assumption in many instances. Again, relaxing this assumption modifies the results, but does not change the basic theory.
- There is no inflation (or inflation is fully anticipated).
- Capital markets are in equilibrium. This means that we begin with all investments properly priced in line with their risk levels. This is a very important assumption and can't be relaxed as such.

As already mentioned, some of these assumptions do not hold good in practice. However, Capital Market Theory explains and helps predict market behaviours quite reasonably well.

16.3 Capital Market Line (CML)

A risky asset is defined as one whose future returns are uncertain. A risk free asset is defined as one whose returns are certain. Since the return of a risk free asset is certain, its standard deviation is zero. Also, the covariance between the return of the risk free asset and the risky asset is zero too. Box 16.1 explains the characteristics of a risk free asset.

Box 16.1: Characteristics of Risk free Asset

- An asset where its returns yield zero standard deviation
- Zero correlation with all other risky assets
- Provides the risk-free rate of return (r_f)
- Will lie on the vertical axis of a portfolio graph as it has no risk

When a portfolio of risky assets is combined with a risk free asset, the expected return of such a portfolio, like the expected return for a portfolio of two risky assets, is the weighted average of the two returns:

$$E(R_{port}) = W_{RF}(RFR) + (1 - W_{RF})E(R_i)$$

Where W_{RF} is the proportion of wealth invested in the risk free asset, RFR is the Risk Free Rate, and $E(R_i)$ is the expected return on the risky portfolio.

For example, if the return on risk free asset is 5% and the expected return on risky asset is 12%. Further, the weight of risk free asset in the portfolio is 70% and rest of the wealth is invested in the risky asset.

The expected return on the portfolio will be:
$E(R_{port})$ = (70% X 5%) + (30% X 12%) = 7.10%

Further, if the risk (standard deviation) of the risky asset is 10%. The risk (standard deviation) of the portfolio will be calculated like this using the Markowitz approach to calculating portfolio risk as explained in Section 15.7:

$$\sigma_{port}^2 = w_1^2\sigma_1^2 + w_2^2\sigma_2^2 + 2w_1w_2r_{1,2}\sigma_1\sigma_2$$

Here, asset 1 is risk free and asset 2 is risky asset.
As the variance of a risk free asset is zero and its covariance with any risky asset is also zero, the formula will be reduced to:

$$\sigma_{port}^2 = (1 - w_{RF})^2\sigma_i^2$$

$= (1 - 70\%)^2 \text{ X } (10\%)^2 = 0.0009$
And the portfolio risk will be
=30%*10% = 3%

Table 16.1 shows 11 combinations of risky asset and risk free asset and the returns and risks of the resultant portfolios. It can be understood from the table, the risk of a portfolio having risk-free asset with risky assets is in linear proportion to the risk of the risky asset. Since risk and the return of such portfolios are linear combinations, a graph of such portfolios will be a straight line combining risky asset and risk free asset.

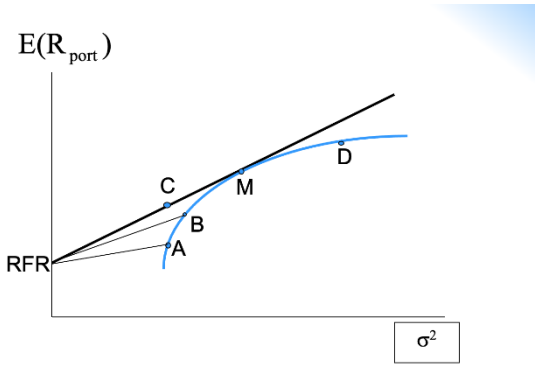
The risk-return relationship holds for every combination of the two components: one-risk-free asset and the other risky assets. Investors would obviously like to maximize their expected compensation for bearing risk (i.e. they would like to maximize the risk premium

they receive). The portfolio combinations of risk free rate and risky portfolios on efficient frontier (Exhibit 16.1).

Table 16.1 Calculation of risk and return of portfolio

Sr. no.	Weight of Risky asset	Weight of Risk Free asset	Return of the portfolio	Risk of the portfolio
1	0	1	5.00%	0.00%
2	0.1	0.9	5.70%	1.00%
3	0.2	0.8	6.40%	2.00%
4	0.3	0.7	7.10%	3.00%
5	0.4	0.6	7.80%	4.00%
6	0.5	0.5	8.50%	5.00%
7	0.6	0.4	9.20%	6.00%
8	0.7	0.3	9.90%	7.00%
9	0.8	0.2	10.60%	8.00%
10	0.9	0.1	11.30%	9.00%
11	1	0	12.00%	10.00%

Exhibit 16.1: Portfolio combinations of RFR and risky portfolios on efficient frontier



In the previous chapter, the concept of efficient frontier was discussed. It is described as an umbrella shaped curve comprising of investment opportunities providing highest levels of returns for given levels of risk. Depending upon the risk appetite and investment objectives, the investor can choose to be on any point on the efficient frontier i.e. pick any combination of securities mapped on the efficient frontier.

Now, by assuming that the efficient frontier in Exhibit 16.1 above is constructed considering all the possible traded risky securities in the investment, and also by introducing a risk free asset in the universe of securities, the investor can now allocate his/her wealth between the

risk free asset and the risky assets. It can also be observed from the above figure, that the portfolios combining risk free asset with risky asset portfolio 'A' lying on efficient frontier are inferior to the combinations offered by portfolios combining risk free asset with risky asset portfolio 'B'. Similarly, portfolios combining risk free asset with risky asset portfolio 'B' are inferior to the combinations offered by portfolios combining risk free asset with risky asset portfolio 'M'. Hence, every rational investor would choose a combination of risk free asset with risky portfolio 'M' depending upon their risk appetite since these combinations are superior to any other combinations. Thus 'M' is the most desirable risky portfolio. All investors depending upon their risk appetite would choose a combination of 'M' and risk free asset. This combination of risky portfolios at point 'M' on the efficient frontier is the most optimal portfolio of all possible combinations of risky assets, when the existing risk free rate is plotting as the intercept in the graph. It is also called the Market Portfolio. The line connecting risk free asset and tangent on efficient frontier at Portfolio 'M'(Market Portfolio) is called **Capital Market Line** (CML). In the presence of risk free asset, this is the efficient frontier. All the other risky portfolios lying below CML are no longer desirable/efficient. As can be observed, a portfolio combination of risk free asset and portfolio M at 'C' is preferable to portfolio 'A'.

In summary, the Capital Market Line helps investors to choose an optimal combination of the market portfolio and the risk free asset. So if the investors can decide how much of her wealth to invest the market portfolio (because it generates higher return than that of the risk free asset), according to her risk appetite, then the remaining wealth can be invested in the risk free asset. To explain the same in an equation we tweak the expected return equation given above as follows:

E(Rp) = ((1 – Wmp) * Rf) + (Wmp * Rm), where Wmp is the proportion of wealth invested in the market portfolio, Rf is the risk free rate, Rm is the return on market portfolio E(Rp) expected return of the portfolio that combines the risk free asset and the market portfolio.

The E(Rp) would plot on the CML as shown in graph 16.1. This equation can also be tweaked further to create the intuition for the CAPM that is explained in the following paragraphs. It would be as follows:

E(Rp) = Rf + Wmp (Rm- Rf);

Every investor could expect a minimum of Risk Free Rate of return and then a proportion of the Excess Return that the market portfolio generates over and above the risk free rate. That is a proportion of the market risk premium.

The risk of the above portfolio where W_{mp} is invested in the market portfolio and the remaining in the risk free asset will be simply $W_{mp} * \sigma_{mp}$.

This can be written as $\sigma_p = W_{mp} * \sigma_{mp}$. Where σ_p is the risk of the portfolio combining the risk free asset and the market portfolio. σ_{mp} is the risk of the market portfolio.

Tweaking this relationship further we can also extract the proportion of wealth that needs to be invested in the market portfolio, given the risk of the market portfolio, and the desired risk on the combination of risk free asset and market portfolio. That is $W_{mp} = \sigma_p / \sigma_{mp}$. That is the proportion of investment should be the ratio of risks of the desired portfolio and the market portfolio. This relationship forms the basis of CAPM model explained in the sections below.

16.4 Market Portfolio

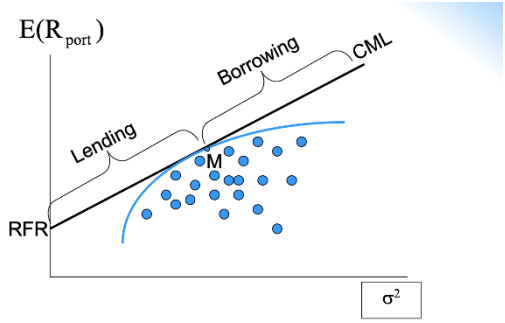
Market portfolio consists of all the risky assets. The theoretical market portfolio should include domestic and foreign stocks and bonds, real estate, coins, stamps, art, antiques, and any other marketable risky asset from around the world. It is not possible to construct such a portfolio in practice. Hence proxies are to be used. Broad based equity market indices are often used as the proxy for such portfolio. There is no unanimity about which proxy to use. An incorrect market proxy will affect both the beta risk measures and the position and slope of the SML that is used to evaluate portfolio performance.

16.5 Extending the CML

The above discussion makes one think that the highest possible return that could be generated using the universe of risky and risk free securities, is that on a market portfolio. Similarly the lowest would be on the risk free asset.

In Exhibit 16.1 the CML was drawn connecting only two points the risk free return on the y axis and the market portfolio return 'M'. All the possible combinations on this line are equivalent to LENDING at risk free rate (that is investing in a risk free asset) and investing in a risky asset portfolio. That is the entire wealth of an individual is invested fully by choosing a combination. What if some investors would like to generate a return higher than that of the market portfolio? Is it possible? Exhibit 16.2 graphically shows the possibility. This is possible when an investor can borrow money at risk free rate, and augment his existing wealth with the borrowing and then invest in the market portfolio. This would naturally generate the return on the market portfolio on every single unit of investment, including on the borrowed portion. However the investor would pay only the rate of risk free asset on the borrowing, and would save an amount of (Return on Market Portfolio 'less' Return on Risk Free Asset). This would add up to the return on market portfolio generated on the investor's existing wealth. These set of opportunities would lie to the right of the point 'M' on the CML.

Exhibit 16.2: Capital Market Line



All rational investors are expected to invest into some combination of risky portfolio 'M' with risk free asset. For instance let's imagine that an investor could generate a return of 20% on a risky market portfolio on the SML and 5% on the risk free asset. If the investor chooses to invest 100% of her wealth into the market portfolio and 0% in the risk free asset, the portfolio return would be 20%. As given in the typical weighted average portfolio return equation below. This would be the maximum return possible on the CML (Exhibit 16.1)

$$(1 * 20\%) + (0 * 5\%) = 20\%$$

If the investor decides to divide her wealth equally between the market portfolio and the risk free asset, the return of the portfolio would be 12.5% as follows. This would be between 20% and 5% as professed by Exhibit 16.1 SML

$$(0.5 * 20\%) + (0.5 * 5\%) = 12.5\%$$

In the same manner, if the investor considers borrowing 50% of her wealth at risk free rate of return and invests her existing wealth and the borrowed 50% too in the market portfolio, then the return would be 27.5% as follows. This is the extension in Exhibit 16.2, depicting the effect of leverage (which is borrowing and investing more than one's wealth). It can be appreciated in the equation that the debt component is subtracted from the return on risky portfolio, because for investor this represent repayment or payment and not receipt.

$$(1.5 * 20\%) – (0.5 * 5\%) = 27.5\%$$

In this manner, infinite combinations of these two assets are possible, and all are plotted on the CML. Depending upon the risk appetite the investor would choose a combination of risk free asset and risky portfolio M. For all the combinations of lending at risk free rate and investing in the market portfolio, the returns would lie to the left of the point 'M' on the SML (Exhibit 16.2) and for all combinations of borrowing at risk free rate and investing in the market portfolio, the returns would lie to the right of the point 'M' on the SML. This is the crux of capital market theory.

16.6 Diversification of risk and market portfolio:

The investment prescription that emerges from capital market theory is that every investor will take exposure to portfolio M (Exhibit 16.1 and 16.2). Because Portfolio M lies at the point of tangency, it has the highest portfolio return, and every rational investor is assumed to be investing in Portfolio M and borrow or lend to be somewhere on the CML. Therefore, portfolio M must include all risky assets.

Portfolio M includes not only equity stocks but all other investment opportunities like corporate bonds, commodities, gold, real estate etc.. Portfolio M comprises of all risky investment opportunities. An investment opportunity that is not part of M, does not exist as every risky asset is part of M. Thus, M is the most diversified portfolio. When the market is in equilibrium, all assets are included in this portfolio in proportion to their market value. If, for example, an asset has a higher weight in the M portfolio than its market value justifies, excess demand for this asset will increase its price until its relative market value becomes consistent with its proportion in the M portfolio and vice versa.

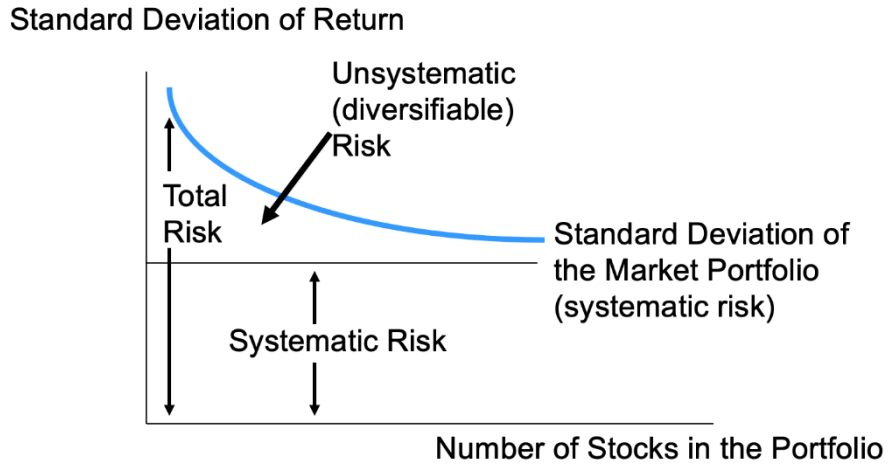
Since every asset/security is part of the market portfolio and M is the most diversified portfolio, no further opportunity of diversification is available beyond portfolio M. Complete diversification means the elimination of all the unsystematic or unique risk. Once all unsystematic risk is eliminated, only systematic risk is left in the portfolio, which cannot be diversified away.

16.7 Types of risk – Market and Non-market risk

As per the capital market theory, investors should invest their funds in only two types of assets—the risk-free security and risky asset Portfolio 'M'. The relative weights of these two types of investments will be determined by the investors' tolerance for risk.

Since the 'M' is a completely diversified portfolio, which means that all risks unique to individual assets in the portfolio is diversified away. The unique risk is referred as non-market risk. The non-market risk in the portfolio 'M' is completely eliminated by diversification. This implies that only the market risk also referred as systematic risk, remains in Portfolio M.

Exhibit 16.3: Risk reduction due to increase in the number of securities in the portfolio



As can been seen in Exhibit 16.3, total risk is made up two types of risk: market risk and non-market risk. By holding a well-diversified portfolio (theoretically portfolio 'M') investors can reduce/(theoretically eliminate) non-market risk. Such portfolio will have exposure to only the market risk.

As can be observed from this graph, as the number of securities(on the x axis) increases in the portfolio, the total risk of the portfolio goes down. Initially the decline in the risk (on the y-axis) is very steep and later it flattens and cannot be completely eliminated. It was an interesting research finding, which led to the concept of systematic risk and market beta. The point at which it flattens depends on the country and the nature of risk appetite of the investors in that country. 20 to 30 securities is a globally found evidence. That is the margin benefit of diversification (that is risk reduction) dies down after 20 to 30 securities are added in a portfolio.

16.8 Capital Asset Pricing Model (CAPM)

As discussed in the section above, when investors invest in the portfolio M (market portfolio), that has only systematic risk, they need to be compensated for bearing only the systematic risk. Because the unsystematic risk is diversified, there is no need for any compensation for the same. Combining this understanding and the understandings from the capital market line, we can arrive at the equation for CAPM as follows

$E(Rp) = Rf + (Rm - Rf) * \sigma_p / \sigma_{mp}$ This is the equation of CML. Now as per the previous discussion the risk of the Portfolio σ_p will only be its systematic risk and that is its covariance with the market portfolio.

$E(Rp) = Rf + (Rm – Rf) * (Cov_{p.m} / \sigma^2_{mp})$

Capital Asset Pricing Model develops this understanding further in a way that allows investors to evaluate the risk-return trade-off for both diversified portfolios and individual securities. This is depicted by SML as explained in the section below.

$E(Rp) = Rf + (Rm – Rf) * (Cov_{i.m} / \sigma^2_{mp})$

COV_{im} = Covariance between the return on the security and the market
σ^2_M = Variance of return on market portfolio

The ratio of Covariance of the returns on a security and market portfolio to the variance of the market portfolio is another way to estimate the popular "market beta" of a security. This results in the following popular CAPM equation

This expression can be written as:

$$E(R_i) = RFR + \mathcal{B}_i(E(R_m) - RFR)$$

The above equation describes CAPM. It defines risk in terms of security's beta. Security's beta is a good proxy of non-diversifiable portion of the risk. The interpretation of beta is straight forward. A stock with a beta of 1 has its returns covariate equally with that of the market portfolio. Meaning that if the market portfolio's returns increase by 10% then the stock's return would also increase by 10%, that is Beta times the change in return in the market portfolio. This aspect is also interpreted as equally volatile as that of the market portfolio. Similarly a stock with beta of 1.50 is more volatile than the market (a 10% increase in the market portfolio's return would lead to 15% change in the stock's returns) and a stock with a beta of 0.80 is less volatile than the market portfolio (a 10% decrease in returns on the market portfolio would lead to 15% decline in the stock's returns).

The risk of the market portfolio is the covariance of the market portfolio with itself which is the variance of the market portfolio.[81] When used in the above equation would make the market beta always equal to 1.

16.9 Security Market Line (SML)

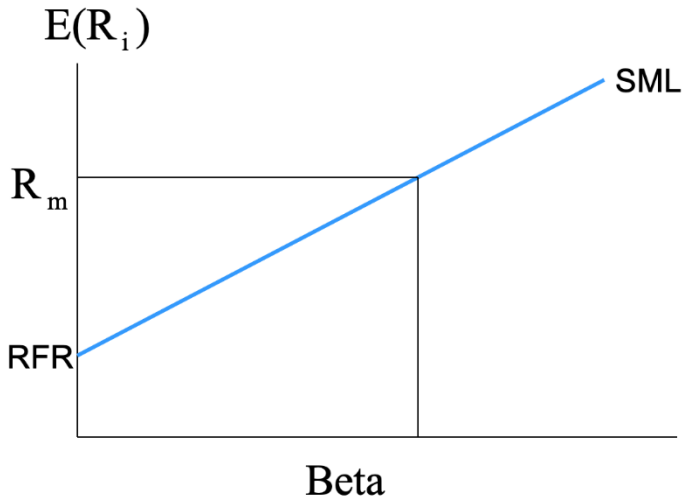
Securities market line (SML) is the graphical representation of CAPM. Security market line graphically depicts the relationship between systematic risk and expected rate of return on an asset traded on the capital market. This is illustrated in Exhibit 16.4. For instance the average risk free rate of a country is 6%, and the optimal market portfolio in that country has historically enjoyed a return of 20%, then the excess return a market portfolio generated is

[81] The covariance of an asset with itself is its variance.

(20 – 6) = 14%. The CAPM is an approach to calculate the rate of return an investor could expect investing in a particular capital asset, with a particular beta. So if the ongoing risk free rate in a country is 8% (Rf), the capital asset has a beta of 1.5 and the excess return on the market portfolio is 14% (Rm – Rf), then an investor could expect to generate 29% on this investment. This is the expected return under perfect market and equilibrium conditions.

8% + (1.5 * 14%) = 29%, which goes by the CAPM's formula Rf + (Beta * (Rm – Rf)

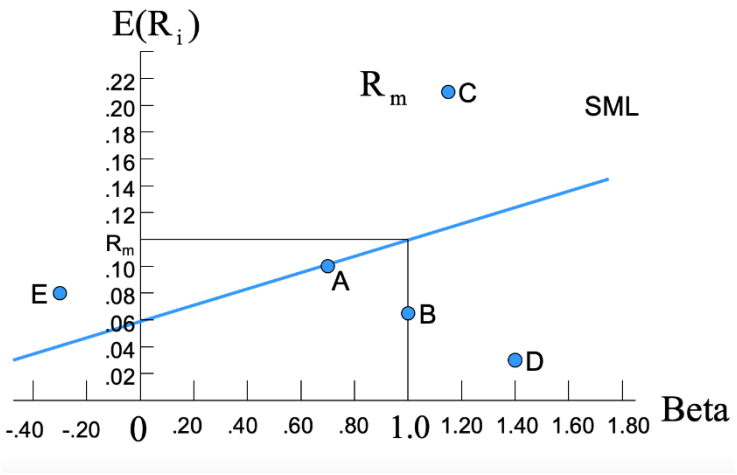
Exhibit 16.4: Security Market Line



So the SML provides an easy way for an investor to expect a desired return, once the investor knows about the systematic risk (Market Beta) of the asset. The investor can plot the beta on the SML on the x-axis and then point on the SML, touched by a perpendicular will directly provide the expected return on the asset.

Theoretically under conditions of market equilibrium, all assets and all portfolios of assets should plot on the SML. Therefore using this phenomenon, undervalued/overvalued/fairly valued security can be identified. Any security with an estimated return that plots above the SML is undervalued. Any security with an estimated return that plots below the SML is overvalued. Say for instance the beta of a stock is 1.2 and the Rf is 8% and Rm-Rf = 14%, then under ideal conditions the stock should generate a return of 8% + (1.2 * 14%) = 24.8%, and plot on the SML. If the stock is currently expecting to generate 26%, then it is plotting above the SML, Then it is supposed to be undervalued.

Exhibit 16.6: Plot of securities on SML



It can be observed from the above graph that, security C lies above the SML. This indicates that it has higher expected return than warranted by its market risk. It is an under-valued security. Similarly security D has a lower expected return for a given level of risk, hence it is overvalued.

16.10 Empirical test of CAPM

Testing the CAPM essentially revolved around testing the stability of Beta as a measure of risk and the relationship between beta and the realized rate of return. Some key results are presented below:

- Numerous studies have found that Beta as a risk measure was not stable for individual stocks, but was stable for portfolios of stocks, also larger the portfolio (e.g. over 50 stocks) and the longer the period (over 26 weeks), the more stable the beta estimate.
- Some studies have found that the betas tended to regress toward the mean. Specifically, high-beta portfolios tended to decline over time toward 1.00, whereas low-beta portfolios tended to increase over time toward 1.00.
- Sharpe and Cooper found a positive relationship between return and risk, although it was not completely linear. [82]
- Black, Jensen, and Scholes examined the risk and return for portfolios of stocks and found a positive linear relationship between monthly excess return and portfolio beta.[83]

[82] Sharpe, W. F., & Cooper, G. M. (1972). Risk-return classes of New York stock exchange common stocks, 1931-1967. *Financial Analysts Journal*, 46-81.

[83] The Capital Asset Pricing Model: Some Empirical Tests
by Fischer Black, Michael C. Jensen and Myron Scholes, STUDIES IN THE THEORY OF CAPITAL MARKETS | 1972

16.11 Multi factor models of risk and return

Markowitz portfolio theory and the Capital Asset Pricing Model (CAPM), represents the foundation for understanding the relationship between risk and expected return. Markowitz Portfolio Theory and CAPM led to the development of several extensions of the framework. CAPM is a single factor (Market Risk) model. It has designated a single risk factor to account for the variability in the return of an investment. Several multifactor models have also been developed. The Arbitrage Pricing Theory (APT), which was developed by Stephen Ross as an alternative to CAPM is briefly discussed below:

Assumptions of APT:

- Capital markets are perfectly competitive
- Investors always prefer more wealth to less wealth with certainty
- The stochastic process generating asset returns can be expressed as a linear function of a set of K factors or indexes

Unlike CAPM, APT does not assume:

- A market portfolio that contains all risky assets, and is mean-variance efficient
- Normally distributed security returns

Arbitrage Pricing Theory:

$$E(R_i) = \lambda_0 + \lambda_i b_{i1} + \lambda_2 b_{i2} + \cdots \ldots \ldots \ldots + \lambda_k b_{ik}$$

λ_0 = the expected return on an asset with zero systematic risk
λ_1 = the risk premium related to the jth common risk factor
b_{ij} = the pricing relationship between the risk premium and the asset

The beta factors determine how each asset reacts to the i'th particular common factor. So unlike CAPM, where a single Beta is calculated to estimate the non-diversifiable risk of the asset, in APT multiple Betas are calculated. Each beta measures the sensitivity of the asset to several risk factors like inflation, growth in GNP, changes in interest rates etc.

Similar to CAPM, APT assumes that unique risk is independent and can be diversified away in a large portfolio. Though APT strives to overcome the practical difficulties of CAPM, its implementation has its own set of challenges. The main challenge is the identification of the risk factors.

Chapter 16: Sample Questions

1. Which of the following would most closely resemble the market portfolio?
   a) Stocks
   b) Stocks and bonds
   c) Stocks, bonds and foreign securities
   d) Stocks, bonds, foreign securities options and coins

2. The correlation coefficient between the return on market portfolio and return of a risk-free asset is:
   a) be $+\infty$
   b) be $-\infty$
   c) be +1
   d) be Zero

3. Theoretically, the correlation coefficient between a completely diversified portfolio and market portfolio should be
   a) - 1.0
   b) + 1.0
   c) 0.0
   d) - 0.5

4. All portfolios on the capital market line are
   a) Perfectly positively correlated
   b) Perfectly negatively correlated
   c) Unique from each other
   d) Weakly correlated

5. A completely diversified portfolio would have a correlation with the market portfolio that is
   a) Equal to zero because it has only unsystematic risk
   b) **Equal to one because it has only systematic risk**
   c) Less than zero because it has only systematic risk
   d) Less than one because it has only unsystematic risk

CHAPTER 17: RISK

LEARNING OBJECTIVES:

After studying this chapter, you should know about:

- The Process of risk management
- Different kinds of risk
- Ways of measuring risk
- Ways of managing Risk

17.1 Definition of Risk

Investment is intrinsically a risky activity. Return is the reward for taking risk. Hence defining, identifying and managing risk is a critical component of portfolio management.

Risk is defined as the variability of outcomes, which can relate to the value of the assets or earnings. Different asset classes have different risk factors leading to this variability. A rational investor would want to maximise her returns while minimizing risk. Any asset class, which is expected to generate higher returns will have inherent high risks. While some risks can be mitigated, a few risks cannot be mitigated.

A prudent investor, therefore, would maintain an optimal balance of risk and return. Role of a portfolio manager is very crucial in understanding various types of risks, taking steps to manage them and price them correctly.

17.2 Process of Risk Management

The overall risk management strategy in investment is no different than managing risks in any other walks of life. The only thing that differs is various tools and technique used specifically to manage investment risk.

At the strategic level, the portfolio manager shall create a risk framework in accordance with the investment objective. Risk framework is important to create awareness as well as culture across the team, both investment and operational. Following the risk framework is even more important, as a continuous process, which needs to be maintained, monitored and modified to maintain its relevance.

The steps involved in the risk management process are:

Setting Objectives: Investment objectives need to be defined with respective risks. This will also help in aspects like determining risk tolerance, performance measurement, portfolio rebalancing, reporting etc..

Identification of Risks: Identification of various types of risks, keeping portfolio objective in consideration, is the next step. Portfolio managers are supposed to list down all major and minor risks.

Analysing the Risks: Next step involves analysing all the different types of risk and its impact on the portfolio. Some risks may have overwhelming impact while others may have negligible impact. Some risks can be quantified, others may not.

Evaluating the Risks: Each risk, thus identified and analysed are evaluated and ranked according to their impact on the investment portfolio. This would immediately bring focus towards the major risks and how to treat them. The two important metrics to evaluate risks are: '*Severity of Risk'* and *'Frequency of Occurrences'*. Process around treatment for each such condition has to be framed and followed.

Treatment of Risk: In an event of risk, the defined framework helps in taking action towards the risk-event. Given the nature, severity and frequency of such risk event(s), the portfolio manager takes one or a combination of the following actions: (i) Tolerate, (ii) Mitigate, (iii) Transfer and (iv) Terminate or close the activity.

Control and Monitor: Risk framework helps in ensuring effectiveness in implementation and monitoring. Data and information are captured, analysed and reported to the concerned authorities. This also leads to modification in framework if needed as risk management is an iterative process to maintain alignment with the business/investment objective.

A better risk framework and risk management helps the portfolio manager in multiple ways:

- Aligning risks with investment objective;
- Easy for investors to understand portfolio's risk profile and tolerance, which in turn helps in managing expectations;
- Limiting amount of risk that the portfolio should take and avoid unwarranted risks;
- Avoid likelihood of excessive risks, which can lead to large losses even bankruptcy;
- Better information flow across teams leading to better transparency and quicker action wherever required;
- Early detection of risks, frauds, capital requirements etc.;
- Improves compliance and audit; and
- Last but not the least, helps in creating value for the portfolio.

17.3 Different Types of Risks

Broadly, risks can be divided into two categories:

- Investment risks, where the value of the portfolio and hence the desired return on investment is at risk e.g. market can go up or down and
- Compliance and Operational risks, which can be due to default, operational risks etc.

Following are some of the key investment risks:

17.3.1 Market Risk

Market risk is due to factors which cause variability in the outcomes across asset classes, and securities. The degree of impact may vary, but these factors influence all investment opportunities. An effort is made to discuss market risk components for broader asset classes:

- **Equities:** Change in stock price is the most common form of market risk. While price of stock is expected to reflect underlying company's prospects, often market sentiments and socio-economic-political policies override it. Things like recession, pandemic, interest rate, government policies lead to potential losses in the portfolio.
- **Bonds:** Bond prices reflect the interest rate in the economy. Corporate bond prices are affected by credit spread too. These factors in turn are affected by broad economic conditions.
- **Currency:** Movement in currency prices impact portfolio's return. Exchange rate on the other hand moves not just on the interest-rate differential but many other factors including economic and political stability, debt situation, demand-supply etc.
- **Commodity:** Commodity prices are impacted by interest rate, demand & supply, cyclicality etc.

Market risks cannot be diversified away. However, options, futures, swaps etc. are some of the hedging instruments that can be used to mitigate market risk.

Market risk is also known as systematic risk. Performance of portfolio cannot remain insulated from the market it operates into.

17.3.2 Non Market Risk

Non market risks are specific to companies or sectors or instruments where the portfolio is invested. These are therefore called unique or idiosyncratic risks. These risks can be reduced by way of diversification of portfolio across investments opportunities.

Risk Type	Impacts	Mitigation
Systematic (Market)	Whole market	Hedging using instruments like Options, Future, Swaps etc.

Non-systematic (Non-Market, Unique, Specific, Idiosyncratic)	Specific to a company or industry/sector	Diversified portfolio

Non-market risk can further be decomposed into sector specific risk and company specific risk:

Sector specific risk is due to factors which affect the performance of companies in a particular sector. Companies in other sectors do not get affected by them. For example, any new regulatory compliance requirements that can suddenly drive up the costs of doing business in the sector.

Company specific risk is due to factors specific to a company. Broadly, these can be discussed under two components:

- **Business Risk:** Whether the company's actual performance is similar to expectation or not. Or is it a function of multiple reasons e.g. product failure, pricing collapse due to competition, supply chain disruption, labour & union issues, regulatory reprimands etc.. All these would result into lower than expected profitability and future prospects, which in turn would impact portfolio return. Usually the variability of cash flows or EBITDA can be a good measure of business risk.
- **Financial Risk:** A weak or sub-optimal capital structure can pose serious threat to company's profitability and future prospects. Cash flows can get impacted adversely. All these in turn would impact portfolio return. More than sustainable level of debt or leverage is a sure cause for financial risk. Measures of leverage are good proxies for measured financial risk.

Other company specific risks e.g. operational, legal, compliance etc. are discussed separately. They are sub-set of the above-mentioned Business Risk.

Total investment risk, therefore, is sum of market risk (i.e. systematic risk) and specific risk (i.e. non-systematic or non-market risk).

Portfolio Risk

Portfolio risk is dependent on risk and return of individual assets that constitute the portfolio and the correlation of returns of these assets. While there can be innumerable ways to create a portfolio, the manager needs an optimal portfolio. Optimal portfolio is the one that generates the maximum return for a given risk tolerance of the investor.

In a two-asset portfolio the expected return is given by the following equation, where w_1 is the proportion of investment in an Asset which generates a return of R_1. 1 - w_1 is the

remaining portion of wealth invested in an Asset which generates a return of R_2. Similarly E(R1) and E(R2) are expected return of assets 1 and 2 respectively.
$E(R_P) = w_1 * E(R_1) + (1-w_1)* E(R_2)$,

The risk of a two asset portfolio is given by the following equation, σ_1 and σ_2 are standard deviation of asset class 1 and 2 respectively. ρ_{12} is the correlation between the two asset class returns.

$\sigma^2_P = [w^2_1 * \sigma^2_1] + [(1-w_1)^2* \sigma^2_2] + [2 \sigma_1 *\sigma_2 *w_1*(1-w_1)* \rho_{12}]$…….(Equation 1)

Intuitively, barring the ρ_{12} term, the above formula is an expansion of the popular $(A+B)^2$ as $A^2 + B^2 + 2*A*B$. Now assuming a value of 1 for ρ_{12} and plugging in this value in the 2 * A * B term, we can relate to our portfolio risk formula in equation 1 (Note: this approach is only for an imaginative explanation and should not be considered as a mathematical appropriateness). Taking this approach further, one can easily appreciate that if the value of ρ_{12} is less than +1, the value of the entire equation would be less than $(A+B)^2$ or $[(w_1 * \sigma_1) + (1-w_1) * (\sigma_2)]^2$, that is portfolio risk will be less than the weighted sum of individual assets' risk: or $\sigma_P < w_1 * \sigma_1 + (1-w_1) * \sigma_2$

A graphical approach and an empirical approach would have shown the evidence that when two assets whose returns are not so perfectly correlated are combined to form a portfolio, then the risk of such a portfolio would be lesser than the weighted average individual risks of the assets' returns. The above mathematical approach has essentially attempted the same through logic and intuition .

This reduction of risk due to combination of assets is known as diversification of risk in a portfolio. Diversification of portfolio i.e. addition of more stocks does reduce risk of the portfolio. However, law of diminishing returns applies here too and after a certain number of stocks (30 to 35) in the portfolio, the decline in risk is very small.

For N-asset portfolio, the equations for portfolio return $E(R_p)$and risk (σ^2_P)can be written as:

$E(R_P) = \Sigma w_i * E(R_i)$,

where wi and E(Ri) are the weight and the expected return of each asset I for all asset I = 1 to N

$\sigma^2_P = \{\Sigma w^2_i * \sigma^2_i + \Sigma w_i *w_j* Cov_{i,j}\}$, where $Cov_{i,j}$ is covariance between i and j (i is not equal to j). And the covariance can also be written as $\boldsymbol{\rho}_{i,j} * \sigma_i * \sigma_j$

A fund manager, therefore, diversifies her portfolio with less correlated assets, sectors, countries etc. Mathematically, it is also quite appealing to think that the entire portfolio risk can be reduced to zero, in case the term of weighted average correlated risk can be exactly equal to the weighted average individual risk. While the intent is to find perfectly negatively correlated assets, but in real life, it is hard to get except for insurance products or put options on the portfolio.

17.3.3 Liquidity Risk

Buying or selling of listed shares is easy compared to buying or selling of a real estate property. Even though equity markets are deep and liquid, there are many stocks which are relatively illiquid. Likewise in the bond markets, many bonds (called on-the-run bonds) are more tradeable than others.

Whenever market is not deep enough to accommodate the desired (normally large sized) size of transaction, there is a risk of significant price impact during such transaction and this is called liquidity risk. Putting in another way, the possibility that an investor would not be able to liquidate a desired size of her investment at a desired price level, is liquidity risk. The liquidity risk is reflected in ***bid-ask spread*** in the market. Lower the bid-ask spread, higher is the liquidity of the security, hence preferred. It is also observed that securities, which are traded on exchanges have better liquidity compared to over-the-counter traded securities. So, we can say that well regulated market, participants and infrastructure improves market liquidity.

Liquidity is a desired attribute of investment. Portfolio managers, therefore, try to create a portfolio which is comprised of liquid securities.

17.3.4 Operational Risk

An investment business runs not just on investments, but many pre and post operations to make it successful. It involves processes, systems, people and third party activities e.g. marketing, sales, settlement, custodial services etc. Any failure at any stage can result into potential loss to the company and/or investments.

Operational risks can be as naive as complacency and as severe as incomplete process and ignorance about fine prints in regulations or contracts. And, the genesis of all is poor planning and slow response by the operations manager. It is therefore very important for the management to monitor operations through iron grip MIS which captures details like delay, errors, reconciliation etc.

In other words, operational risk is the risks of potential losses due to inadequate or failed policies, processes, systems and people.

It is therefore, even more important to have a proper risk framework, which is monitored, controlled, audited and modified on a regular basis.

- People needs to be trained;
- IT systems needs to be audited;
- MIS & Data analysis should monitor deviations and impact;
- Internal policies need to be reviewed to remove inefficiencies;
- Forced breakdowns to proactively find out loopholes etc.

17.3.5 Regulatory Risk

Business environments change and in the recent times these changes are more frequent. One such change in environment is due to regulation promulgated by a country keeping larger interest in mind, however some businesses are impacted adversely too. Financial and Real Investments are more prone to regulatory changes.

Separation of Securities Transaction Tax, Dividend Distribution Tax, Repatriation Tax, Distribution and Advisory business of intermediaries in capital market, absence of Double Taxation Avoidance Treaty among countries, imposition of tariff and non-tariff barriers etc. are some of the examples of how a regulation can impact investment interest of portfolio companies.

Change in existing laws and regulations, either by the government or the regulatory body, can potentially impact investment returns due to increased regulatory costs or change in competitive landscape. Impact of regulatory risk is quite significant and can lead to complete closure of business. It is for this reason, regulatory risk and compliance is now in the forefront of every organization. It is important to note here that non-compliance of regulation not only results in penalty but can lead to permanent loss of trust to its clients.

Portfolio managers have fiduciary responsibilities towards their investors. Therefore, assessment of regulatory and compliance risks of their investee companies (and their own company) is of highest importance for the portfolio managers.

17.3.6 Legal Risk

Contracts are entered into with other parties on a regular basis for product, services or other requirements. In spite of formal agreements, there are disputes. The resolution of disputes needs to be quick and affordable. But in reality, legal disputes are both long-drawn and costly besides its impact on ongoing businesses.

Legal Risk, therefore, is when a third party sues the company for breach of contract resulting into potential loss to an investment due to (i) lengthy, (ii) costly or (iii) unfavourable verdict. A country, with evolved and unbiased legal system, is always favoured over others where legal systems are still evolving.

Therefore, the portfolio manager has to evaluate legal risks of investee companies before and during the investments. In complex transactions, the need is even more highlighted and

portfolio managers would have in-house legal experts to draft agreements and plug all the loopholes which may result into potential conflict. Besides expertise, proper documentation helps in mitigating such risks.

It is important to recognise the difference between Legal Risk and Regulatory Risk. Regulatory Risk is a part of Legal Risk. Regulatory Risk is related to unfavourable changes in regulations and governing laws. Legal Risk is related to enforceability of contracts.

17.3.7 Geo Political Risk

Today, world is more inter-linked due to communication and globalization. Besides movement of people and trade, investments are also crossing boundaries seamlessly and entering different countries.

Geo-political risk, therefore, arises in an investment scenario, when the country in which the investment is made experiences unfavourable economic conditions due to its relationship with neighbouring countries or other countries or regional groupings in the world. For example, in the recent times USA and India are at loggerheads with China; Gulf tensions, Cyberattacks, European Fragmentation etc. are examples of events which lead to geo-political risk to investments in the affected countries.

Geo-political risks are long-term in nature and often gets adjusted in the investment price. But price movements can be wide whenever risks get aggravated and portfolio manager needs to keep this risk in consideration.

17.3.8 Currency Risk

Whenever the investments are in foreign currency, there is a possibility of adverse movements in exchange rate. This may have an impact of potential loss on the portfolio calculated in domestic currency. The loss can be on value of assets, cash flows in terms of dividend or interest payment etc.

Currency depreciation happens due to many reasons including interest rate differentials, country's debt position, sovereign credit rating, liquidity, non-availability of currency risk mitigation tools etc..

Currency risk, to a large extent, is mitigated using hedging instruments e.g. futures, forwards, swaps etc. which are widely available in international financial markets. Both investors and companies widely use these tools to minimise currency risks.

The portfolio manager is required to understand the currency risks of the investments but also of investee companies due to their international business. At both level the risk

mitigation techniques needs to be evaluated to understand the overall quantum of currency risks.

17.3.9 Country Risk

Whenever a portfolio manager diversifies her investment to different countries, the first thing she considers is how businesses operate in that particular country. This assessment is a fundamental step and needs to be synchronised with the objective and risk framework of the portfolio/company.

Each country is unique in terms of its economic, political and business environment. Each of these moving parts play significant role in the return outcome and can result into potential loss to the investment.

We may assume that matured and developed countries have low country risk as compared to emerging markets due to various reasons including political and economic stability, evolved judicial systems which enforces contract in true manner, better liquidity & low transaction costs etc.

Types of Countries	**Example**	**Characteristic**
Developed Nations	USA, England, Japan, Australia etc.	• Largest & most industrialised nations • Well established rule of law • Business interests overshadows politics • Lower growth rate
Emerging Markets	China, India, Brazil, Russia etc.	• Rapid industrialization • High economic growth rate • Riskier destinations providing superior investment return • Higher political uncertainty
Smaller Emerging Markets	Better than least developed countries e.g. Botswana, Kuwait, Nigeria, Iran etc.	• Also known as 'Frontier Markets' • High Risk- High Return markets • High political risks • Illiquid and small in size

Generally, a country with better credit rating will have a lower country risk. However, portfolio manager also analyses economic growth, country's debt and liquidity position, social parameters etc. to arrive at an overall country risk. Inspite of the presence of country risk, benefits and costs of diversification, investment vehicle and risk mitigating tools prompt investors and fund managers to take up international investments.

17.3.10 Concentration Risk

Investment managers, also, follow the basic mantra of 'do not put all your eggs in one basket'. The risk of potential losses arising due to having a large (or disproportionately large) pie of the portfolio invested in a particular security or asset class or a market.

Because of this large concentration of investment in a particular security/asset/market, the return of the portfolio is highly correlated to the movements of such oversized investment.

In other words, *Concentration risk is a risk arising due to lack of diversification of portfolio.* Various securities/asset classes/ markets balances each other due to their correlation when well diversified in a portfolio.

There are various forms of concentration in the portfolio:

- **Intentional:** When portfolio is constructed with a view that a particular sector or asset class will outperform, it is a form of intentional concentration. Sectoral funds such as Pharma Funds, Technology Funds, Consumer Durables Funds, Banking & PSU Bonds etc. are example of concentrated portfolio.
- **Asset Performance:** When a particular security or asset class performs disproportionately compared to other components of the portfolio, it leads to concentration unless rebalanced.
- **Correlated Assets:** When different components of portfolio are highly correlated (means they move in tandem), even though they may appear to be diversified, the portfolio runs into concentration risk.

A diversified portfolio represents different asset classes or different sectors within an asset class, or different securities within a major sector. As mentioned earlier (i) asset performance and (ii) correlation can change the nature of diversification. Hence, it is important to monitor and rebalance, if necessary, to maintain diversification of the portfolio.

Portfolio managers, therefore, adhere to their risk framework which has the guidelines to manage concentration risk. The guidelines sets the threshold limit for (i) individual security, (ii) sector, (iii) asset class and (iv) country. Such framework also highlights ways and means to rebalance the portfolio in case of breach of threshold.

17.3.11 Pandemic Risk

Pandemics are large-scale outbreaks of infectious disease over a wide geographic area and increase mortality and morbidity. It vastly disrupts economic, social and political activities. Increase level of global travel, urbanization, sedentary lifestyle, exploitation of natural resources etc. are further adding to the risk of pandemic.

Spread of COVID 19 has brought the world to stand-still. Economic activities had plummeted and there is a great loss to human lives. In such a situation, investments could not remain aloof of the ground reality and ground activities. When production suffers, it dents corporations profitability, the cashflows and hence both the stock and the bond prices. The effect of pandemic can range from short-term to long-term.

- While contracts and agreements between parties address such issues through protection clauses, the level of disruption can be much more severe and can threaten the very existence of companies.
- Secondly, pandemic is a systematic risk and does not discriminate between sectors. It is difficult to diversify.
- While pandemic is systematic risk, there are sectors which are relatively less affected both due to nature of business or government policies introduced to control and fight the pandemic.

17.4 Measuring Risk

Risk measurement has evolved with time and the modern way of measuring risk started with Harry Markowitz, when he published a paper in the journal of finance titled "portfolio selection" in 1952, introducing the concept of 'Efficient Frontier' and 'Mean Variance optimization'.

Markowitz proved that the variance of a portfolio return is not only due to the weights and variances of each security return in the portfolio but also because of the correlation between the securities return.

Markowitz' study was further supplemented by Sharpe and Lintner, in 1964, when they introduced 'Capital Asset Pricing Model'. It incorporated concept of 'risk free asset' along with *one* 'super-efficient portfolio' on the efficient frontier to create a superior alternative at every risk level. 'Super- Efficient Portfolio' refers to a supremely diversified portfolio where it should include every traded asset in the market, held in proportion to its market value. It is, therefore, also termed as market portfolio. Thus, the concept of 'beta (β)' was introduced as a measure of relevant risk.

With this background, the risk measurement tools and practices are discussed further.

17.4.1 Measuring Market Risk

Beta is a proxy for systematic risk or market risk for a traded asset. Market risks cannot be contained by diversification of the portfolio. However, options, futures, swaps etc. are some of the hedging instruments used to mitigate market risk**.**

17.4.2 Value at Risk (VaR)

Value at Risk (VaR) is a measure of estimated maximum potential loss (i) over a certain period, (ii) with a given probability and (iii) under a particular market condition. Let us understand it with a statement below:

"The 5% VaR of a portfolio is INR 1.2 mn, over a 1-day period, on a normal trading day. When the portfolio value is INR 100 million".

VaR can be interpreted as follows:

- Out of 100 possible occurrences of gains and losses in portfolio value, during a chosen period into future, in 95 occurrences the loss of portfolio value would not exceed Rs.1.2 mn. This is not to say that that there would not be any losses. Rather it means that 95 out of 100 times the losses would be less than Rs.1.2 mn;
  OR,
- One could say at 95% confidence Level, the maximum loss of portfolio value would be Rs.1.2 Mn
  OR
- Out of 100 possible occurrences of gains and losses in portfolio value, during a chosen period into future, in 5 occurrences the loss of portfolio value would exceed Rs. 1.2 Mn.
- VaR is the 5 percentile value of a set of 100 portfolio value observations, when arranged in a descending order.

It is important to note here that, VaR:

- is measured in currency terms (though it can also be measured in percentage terms, when referring to the return for a chosen period);
- it is an estimate for a given time period into future,
- and it is estimated at a particular Confidence Interval.

There are basically three approaches to calculate VaR:

17.4.2.1 Parametric Method

It is the simplest method, where we first calculate VaR based on two statistical parameters, Mean and Standard Deviation, representing Return and Risk, respectively. "Mean" and "Standard Deviation" are estimated statistically from a sample, drawn from a population, referring to them as "parameters", hence the name Parametric Method.

The Value at Risk of the portfolio (in currency terms) for a given confidence interval, and given time duration, can be calculated as:

[(E(P)*(n)) - (Z-Score * σ(P)* Rootover (n)] * Portfolio Value

Where E(P) is the expected daily return of the portfolio in percentage.
σ(P) is the expected daily standard deviation of the returns of the portfolio

z-score is the standard normal score that facilitates arriving at a cut-off point to segregate all returns lower than this cut off point, with some probability.

n is the number of days. In case of a week, n=5.

Typically 250 or 252 days are considered for annual trading days and not 365.

The above formula can be used to calculate VaR for any number of days, by plugging in the value in 'n' in the above formula. Annual values of Returns can be converted into daily values by dividing them by 250 or 252; and Annual standard deviations can be converted into daily standard deviations by dividing it by root over 250 or 252.

In VaR calculations, this z-score is always taken with a negative sign, because VaR is essentially a loss focused metric. Similarly, the probability of experiencing only negative returns is to be considered while calculating VaR.

Understanding the rationale of considering the probability associated with only negative returns:

Extending the evidence from empirical research on asset prices, the parametric method assumes that short term or high frequency (daily, weekly) asset returns are log normally distributed, if not normally distributed. Normal distributions are symmetric distributions, with equal number of observations above and below their mean value. This also means that there would be 50% probability of finding a randomly picked value of any chosen variable, being greater than or lesser than its mean value. Large data sets of asset return abide by this property, especially when their standardized[84] values are considered. The mean of standardized normally distributed variables is 0 and its standard deviation is 1. The entire range of values that a standard normal distribution accommodates is from – infinity to + infinity. As per the properties of the standard normal distribution, ***approximately***, 68%, 95%, and 99% of the times, the true value of a normally distributed variable, would lie within 1 standard deviation, 2 standard deviations, and 3 standard deviations around its mean value,

[84] A standardised value of any variable is arrived as number of standard deviations from the mean, or (X – Mean X) / (Standard Deviation of X). Such standard values are popularly known as "normal deviates", "Z-Scores"

respectively. Assumption of normal distribution is extremely crucial to predict future price movements, and also to strategize for risk management. In reality, however, the prices and returns of assets, whose prices are determined by market, are far from being normally distributed. Sophisticated models have also been developed to handle non-normality of asset price returns, which are not discussed in this book.

The constants 1, 2, and 3, referred above, are called "Z-Scores" or the lower and higher cut off points of a range, around the mean. They correspond to the approximate confidence Intervals of 68%, 95%, and 99%, respectively. These percentages also refer to the probability that the true value of a standardized normally distributed variable would fall within a range of "Mean + (Z times Std.Dev)" and "Mean – (Z times Std. Dev)". Once a desired confidence interval of x% is established, then 1-x% is the total probability with which any chosen variable would lie outside the desired range, determined by the lower and higher cut off values. "1 - Confidence level" is known as "Significance Level". Due to the symmetric property of normal distribution, the probability represented by Significance Level can be divided equally: to represent each of the probabilities with which the variable will lie to the left and right sides of the desired confidence interval range.

For instance, at an approximate 95% confidence interval, 1 – 95% or 5% is the Significance Level. Then there is 2.5% probability that the value of a standardized normally distributed variable will be greater than 2 standard deviations plus the mean, and 2.5% probability that it will be less than 2 standard deviations minus the mean. Indirectly out of 100 occurrences, 2.5 occurrences could be found on both the extreme sides; away by 2 standard deviations from the mean.

For the sake of explanation, we used approximate percentages and rounded the Z-Values. However, in practice the readymade Z-Tables (Standard Normal Tables), provide the probability values with 4 decimal precision, and z values with 2 decimal precision. [Z-Table in the annexure]. The rows headers represent one decimal precision of z values, and the column header represent the second decimal portion of a chosen z-value. The table entry (the row column cell) represents the ***probability that a given variable would lie to the left of its standardized value (z-score).*** This table can be used to extract the probability when z-score is given OR to extract the required z-score when the probability is given.

A little care should be exercised while using this standard normal table. One should be clear about the objective of analysis before picking up either a z-value or the probability value. If one is estimating the probability of a variable NOT FALLING WITHIN A PARTICULAR RANGE, then they should allow the variable to take positive and negative values (when the mean is 0). BUT, if one is estimating the probability that the variable WILL FALL BELOW A PARTICULAR VALUE, then the focus should only be on the negative side (when the mean is 0). For instance, IF one requires to be 95% confident that a variable would lie within a particular range of

values, then it is OK for the variable to lie to the left and right side of the desired range, each with 2.5% probability (because the remaining 5% probability is divided equally to the positive and negative sides around the mean). Accordingly, the relevant z-value from the table would be 1.96. However, if one requires to be 95% confident that the value of a variable would not be LESSER THAN a desired value (not a desired range), the entire remaining 5% should be assigned to the probability of the variable being LESSER THAN the desired value. Accordingly, the relevant z-value from the table would be 1.645.

VaR is a loss focused metric and is similar to the lower percentiles. Therefore, one is interested only in extreme negative returns and their associated probabilities. Therefore, the entire value of "1 – Confidence Interval" should be assigned to the probability of experiencing negative returns. This understanding is important to pick up the relevant z-score in the above formula for VaR calculation. As detailed above, for 95% VaR calculations the relevant Z-Score should be 1.645, for a 90% VaR it should be 1.282, and for 99% VaR, it should be 2.33.

Let us understand this with a simple example:

Assuming an annual expected return of 15%, and annual Standard Deviation of 20%, let us find out the 99%, 95%, and 90% VaR for a $100 million portfolio: That means we are interested to estimate the maximum possible negative return, or maximum possible portfolio loss (in currency terms), 99%, 95%, and 90% of the times, respectively. To estimate this we need to pick up the relevant z-scores from the standard normal table, which provide the probabilities of negative returns being larger than the maximum possible negative returns, of only 1%, 5%, and 10%. So, the corresponding z-scores are -2.33, -1.645 and -1.282. The tables below show the next steps to estimate the VaR either as a percentage or Portfolio Value.

Portfolio Value	**Annual**	**Daily**
Expected Return	15%	0.06%
Standard Deviation	20%	1.26%

Daily Return = Annual Return / 250 = 15% / 250 = 0.06%
Daily Standard Deviation = Annual Standard Deviation / Rootover (250) = 20 / Rootover(250) = 1.26%

Metric	**Scenario 1**	**Scenario 2**	**Scenario 3**
Portfolio Value ($ mn) (PV)	100	100	100
Daily Return (DR)	0.06%	0.06%	0.06%
Daily Volatility (DV)	1.26%	1.26%	1.26%
Confidence Interval	99%	95%	90%
VaR %	1%	5%	10%
Confidence Level Statistic (CLS)	2.33	1.645	1.282
Portfolio VaR (%) (PVaR%) = DR – (CLS * DV)	2.876%	2.013%	1.555%

Portfolio VaR ($ mn) =PVaR% * PV	2.876 Mn	2.013 Mn	1.555 Mn

17.4.2.2 Historical Simulation Method

In the historical simulation method, the portfolio's return is simulated assuming the same composition is in existence for a long period, say 5 years. The daily return (or weekly or monthly return) is calculated. Such returns are now arranged in descending or ascending order. And then finally 1%, 5%, 10% or any other value, for which VaR is needed, is calculated using percentile approach. In case of 5% VaR, the lowest 5 percentile values are taken in consideration.

It is generally observed, that VaR estimated using historical simulation is lower compared to parametric method due to the fact that the true price change doesn't follow normal distribution, which was a primary condition in case of parametric method.

In both the cases i.e. parametric and historical simulation, weights are kept constant for the portfolio throughout the period of estimation and calculation.

17.4.2.3 Monte Carlo Simulation

Monte Carlo Simulation is achieved by simulating the portfolio's return over a desired period. Portfolio's value and returns are randomly generated with the given statistical parameters (the random number is generated using either the historical parameter or based on the user's assumptions). It is then repeated for a large number of times, nearly 10,000 times. Such outcomes are then arranged in ascending or descending order like in historical simulation method. And finally, VaR is estimated based on the result using percentile method, again similar to historical simulation method.

Monte Carlo simulation works best compared to other methods, when factors affecting market are many and portfolio also is complex with many constituents. Secondly, it can accommodate any distribution pattern.

Advantages & Limitations of VaR

Advantages	Limitations
• Simple and easy to understand • Universally accepted practice including regulators • Helps in capital allocation across portfolios	• Subjectivity involved • Underestimates both the extreme loss and the extreme gain scenarios

17.4.3 Stress Testing and sensitivity analysis

While data and statistical analysis are used to arrive at reasonable estimates of risk, but a prudent portfolio manager would also bring in expertise and experience to the portfolio to

evaluate the outcome to establish causality and not blindly rely on data, which may be redundant.

Each portfolio manager, employs tools to look at primarily two things:

- How sensitive is the portfolio vis-à-vis market movements and/or various risk factors?
- What are the thresholds for various factors and under various scenario?

The first one is known as sensitivity analysis and the second one is stress testing.

Sensitivity of the portfolio is measured by beta (for equity portfolio), duration (for bond portfolio), delta (and also gamma and vega) (for options based portfolio). These measures indicate how risk is impacted by change in the underlying value.

A portfolio manager, therefore, would create multiple scenarios and evaluate the outcome. This would tell the portfolio manager that how and why some of the variables are impacting returns more than other variables. Portfolio manager, accordingly, takes steps to keep the risk within the stipulated region.

On the other hand, when the portfolio manager creates a scenario of extreme negative event in one or many factors to ascertain risk or potential loss of the portfolio, it is referred as 'Stress Test'. Stress tests can be observed by either recreating a past negative event or creating a hypothetical event to assess extreme loss in the portfolio. This allows managers to be prepared for sudden and large negative swings in the market. In real life, despite having risk framework in place, large swings are sudden and give little time to the portfolio managers to act. If the manager is prepared for such 'black swan' events, it is easy to rebalance during the crisis hour.

17.4.4 Measuring Liquidity Risk

The liquidity risk is reflected in ***bid-ask spread*** in the market. Lower the bid-ask spread, higher is the liquidity of the security, hence a preferred inclusion into the universe of investment assets. Here, we consider bid-ask spread as cost of roundtrip transaction. Quantity plays a significant role in bid-ask spread. Hence, when the size of transaction value is much large, bid-ask spread widens. Likewise, if time taken to liquidate a large position is long, then the length of such time taken to liquidate positions during crisis period is calculated. So, in broad sense, (i) bid-ask spread and (ii) time to execute the trade without impacting the price are two parameters, which will determine the liquidity risk.

Bid- Ask spread measure (Cost of unwinding position)

The bid-ask (offer) spread measure is one of the easiest ways of measuring liquidity risk. Imagine a security to be bought and sold, both legs, simultaneously. The difference between the buy and the sell price is bid-ask spread.

Since, one looks at only one end of the trade to either buy or sell the security at a particular time, we have to calculate half of bid-ask spread as cost.

- Bid-Ask spread = (Ask price - Bid price);
- Mid-Market Price = ½ * (Ask price + Bid price)
- Proportional Bid-Ask spread = Bid-Ask Spread/ Mid-Market Price
- Portfolio Liquidity Risk (or cost) = weighted average sum of proportional bid-ask spread

The following example will explain the concept:

Suppose a portfolio manager has to buy 1 million shares of company A where the market quotes are: Bid price: Rs.99 and Offer price: Rs.101. The liquidity risk cost is calculated as follow:

- Bid-Ask spread= 101-99 = Rs.2
- Mid-Market Price= ½ * (101+99) = Rs.100
- Proportional Bid-Ask spread = 2/ 100 = 0.02
- Mid-Market value of your investment = 1mn * Rs.100 = Rs.100 mn
- Therefore, Liquidity risk cost = Rs.100mn * 0.02 = Rs.2mn

Since a portfolio has more than one stock, the portfolio liquidity cost will be weighted average sum of all constituents.

Liquidity Adjusted VaR

The liquidity-adjusted VaR is the regular VaR plus the cost of unwinding positions.

It is important to understand that unwinding during a normal market will be different from that during a stressed market where even the bid-ask spread will display random movements. Therefore, during the stressed market, the liquidity cost will also need to take into account such random movements.

17.4.5 Measuring Credit Risk

Credit risk is the risk of potential loss resulting from the counterparty failing to make full and timely payments of interest and/or principal for debt oriented securities like bonds. An issuer, who is issuing bonds, is expected to service its commitments. When it is not able to serve its commitment (deteriorating financial health, bankruptcy etc.) it defaults. Credit or default risk, is therefore, inherent to corporate bonds. Though government and government backed bonds (such as PSUs, Municipals etc.) are not expected to default in domestic market; they are not completely credit risk free. Credit rating agencies evaluate financial situation of an

issuers and assign them a suitable rating. In India, it is mandatory to obtain a Credit Rating before issuing any Bond or Commercial Paper.

Whenever a portfolio manager learns about rating downgrade or a sudden rise in bid-ask spreads for its investments, she knows that it is a highly probable case of default or credit risk. All the necessary action as per the risk framework has to be taken to mitigate the default risk. Despite all the efforts, sometimes the portfolio suffers credit losses due to failing businesses. Portfolio manager, therefore, has to continuously monitor the credit quality of portfolio constituents and also if they are priced correctly for the expected credit loss.

In practice, portfolio manager does not entirely depends on credit rating but do their own credit research to evaluate issuer's financial conditions and future prospects. Such analysis revolves around the four Cs: Capacity, Collateral, Covenants and Capital. This helps in arriving two main components (a) probability of default and (b) loss given default.

Challenges in Credit Risk Management

- **Sharp deterioration in credit quality:** Many a times, weakening of financial health is very fast or sudden. Credit Rating, in such cases, do not accurately reflect company's ground reality. Loss incurred due to such incidences are very high on the portfolio and at times leads to capital erosion.
- **Poor portfolio diversification:** Bond issuances are highly regulated and not all sectors are equally represented in fixed income market. In India, financial sector dominates the corporate bond market. This restricts benefits of diversification.
- **Higher Tail Risk:** If the probability of extreme returns on assets or portfolios is greater than that in a normal distribution or any investor's model's distribution, then the investment is said to have tail risk. The difference between the theoretical loss and the actual loss are sometimes large enough to impact investment value significantly.

There are three components in measuring credit risk:

Probability of Default: The probability of default has to be estimated both at security level and at the portfolio level. Credit rating generally indicates the ability of the borrower to service the specific debt instrument, that is rated.

Exposure at Default: The amount outstanding, both principal and interest together, is the exposure towards the borrower. This is the maximum amount, investor or lender can lose.

Loss Given Default (LGD): LGD is an estimation of expected loss, in money terms, due to the borrowers defaulting on loans. It is calculated by multiplying probability of default and the exposure at default.

VaR in measuring Credit Risk (CVaR)

Value at Risk (VaR) is slowly gaining ground in measuring credit risk. The process and methodology is very similar to Market Risk VaR or Equity Portfolio VaR. Two types of models help in CVaR:

- Assume that the counterparty will default at the worst possible times of markets, and simulate changes on Market Risk factors; and
- Assume Market Risk factors remain constant, but the counterparty credit quality changes.

Most popular Credit VaR measuring tools are Credit Risk and Credit Metrics.

17.5 Managing Risk

Having (i) formulated the risk framework, (ii) identified the various risks and (iii) analysed and measured it, the next important point is to manage the risk(s).

Managing risk include two key aspects:

Treatment of Risk: In an event of risk, the defined risk framework of the portfolio manager and its organization helps in taking action towards the risk-event. Given the nature, severity and frequency of such risk event(s), the portfolio manager takes one or combination of the following actions: (i) Tolerate, (ii) Mitigate, (iii) Transfer and (iv) Terminate or close the activity.

Control and Monitor: It is about ensuring effectiveness in implementation and monitoring. Data and information are captured, analysed and reported to concerned authorities. This also leads to modification in framework, if needed as risk management is an iterative process to maintain alignment with the business/investment objective.

17.5.1 Managing Market Risk

As discussed earlier, market risk is a systematic risk and cannot be mitigated by way of diversification. Secondly, market risk is beyond control of market participants and hence ways and means are required to manage it. But one size doesn't fit all participants. There are some key factors, which acts as a guiding principle:

- Risk factors, which the investment is exposed to.
    - For example, equity and debt portfolio will have different risk factors.
- Degree of leverage of the participant.
    - Which will further be constrained due to capitalization and leverage threshold.
- Regulatory guidelines

So, each participant e.g. Investment Managers, Pension Funds, Insurance Companies, Banks, Individual Investors etc. will formulate their own strategies—well incorporated into the risk framework, to manage risks.

A combination of (i) Risk parameters and its thresholds, (ii) Scenario Analysis, (iii) Stress Testing results and (iv) Value at Risk will guide, under normal business conditions, the participant that how and to what extent:

- Capital to be maintained (risk budgeting);
- Leverage to be maintained;
- Position limits to be maintained (limits at country level, sector level, security level, trader level, investment manager's level, counterparty level etc.);
- Stop loss limits
- Parameters to be controlled e.g. beta, duration; and
- Buy available tools such as options (protective put), futures, swaps etc.

However, if the level of risk crosses 'tolerating and mitigation' threshold levels, managers would get into the 'transfer mode. In the 'transfer' mode, managers would take actions such as: floating-to-fixed Swaps, Swaptions, reinsurance etc. where while the product is with the participant, risk is transferred to someone who is well suited to bear those risks.

But, when the risk is too large to be handled by the participant for various reasons, it is better to exit by way of terminating the activity and protect capital and participant's own existence besides protecting investor's wealth.

Besides all these, data analysis and monitoring is of utmost importance. Monitoring by and reporting to the appropriate authorities is required to take timely actions and avoid both monetary and regulatory penalties.

17.5.2 Managing Non-Market Risk

Non market risks are those risks, which are not due to the market but due to the investee company's risk. This is also known as idiosyncratic or specific or unsystematic. This risk can be addressed via diversification.

It comes from the following:

- **Business Risk:** Risk of business disruption due to various reasons such as product failure, pricing collapse given competition, supply chain disruption, labour & union issues, regulatory reprimands etc.
- **Financial Risk:** Risk of financial deterioration such as: excessive leverage and poor capital structure, financial loss due to unhedged positions etc. shall also impact business value.
- **Operational Risk**: When the operations are inefficient and impacting both productivity and profitability of the company.

- **Compliance and Legal Risk**: Non-adherence to regulatory compliance or getting into significant legal tussles also impact the business, operation and profitability of a company.

We manage the non-market risks by ways of:

a) **Diversification of portfolio:** This is to have large number of constituents (say 35 or more) in the portfolio. It is very unlikely that all companies will sink together. This protects from severe downside.

b) **Add constituents which are poorly correlated:** Invest in different asset classes that are poorly correlated. They provide natural hedge to the portfolio.

c) **Monitoring the constituent company:** Participants, rating agencies and analysts continuously monitor company's business, operational and financial health. It gives them early signals. However, it is both time consuming and costly.

d) Finally, risks which are not worth carrying should be terminated.

17.5.3 Managing Risk that cannot be managed

During the 2008 financial crisis, many big bracket financial institutions failed. It is not that these institutions did not have any risk management in place. On the contrary, some of them had detailed and functional risk framework in place. Still, they were hit hard and went under. COVID-19. Pandemic is another such example.

'Black Swan' (the term coined by *Taleb*) has now become more frequent in one or the other form. To deal with such unforeseen events, one has to rely on preparedness, which are already discussed, but presented here again:

- Scenario Planning;
- Tail Risk assessment;
- Stress Testing; and
- Simulation.

Chapter 17: Sample Questions

1. Which error(s) can be termed as Model Risk while developing a model to measure investment risks?
   i. Assuming the distribution to be normal, which may not be the case in reality
   ii. Assuming the tails to be thin, which may be different for the observations
   iii. Using 10-year G-Sec yield as risk-free rate while discounting equity cash flows

   a. I only
   b. I and II only
   c. II and III only
   d. I, II and III

2. "The 5% VaR of a portfolio is USD 1.2 million over a 1-day period on a normal trading day."- What this statement means for a risk manager:
   i. A maximum loss of $1.2mn 95% of the time
   ii. A maximum loss of $1.2mn with a 95% level of confidence
   iii. A minimum loss of $1.2mn 5% of the time
   iv. A minimum loss of $1.2mn 95% of the time

   a. I only
   b. I, II and III only
   c. I, II and IV only
   d. II and IV

3. Which of the following is a limitation of the historical simulation method while developing a model to measure investment risks?
   i. The past may not repeat itself.
   ii. Distribution is assumed to be normal (bell-shaped).
   iii. Mean-variance estimates can be biased

   a. I only
   b. I and II only
   c. I and III only
   d. I, II and III.

4. Which of the following is NOT a correct with respect to Value at Risk (VaR)?
   i. It is a simple concept and can be easily communicated
   ii. It provides a basis for comparison
   iii. Correctly estimates the frequency of extreme events
   iv. Takes liquidity of assets into account

a. I and II only
b. II, III and IV only
c. III and IV only
d. None of these

5. Non market risks are those risks, which are not due to the market but due to the investee company's unique risk. This is also known as
    a. idiosyncratic risk
    b. specific risk
    c. unsystematic risk
    d. all the above

Sample Caselet

1. When the expected annual return on a portfolio is 18% and it variates with a standard deviation of 20%. Then what is the 95% VaR of this portfolio, for a 10 days holding period? Assume a 250 days in a year and take 1.645 as the relevant Z value for the calculation of VaR.

    a) -5.83%
    b) -6.55%
    c) -7.81%
    d) -8.53%

    Answer: a) -5.83%
    Explanation: Daily return 0.18/250 = 0.072%; 10 days return = 0.072 * 10 = 0.72%; Daily standard deviation = 1.26%; 10 days standard deviation = 1.26 * rootover 10 = 3.9845; 10 day VaR in percentage terms @ 5% significance level or 95% confidence = 0.72 - (1.645 * 1.26 * root over 10) = -5.83%

CHAPTER 18: EQUITY PORTFOLIO MANAGEMENT STRATEGIES

LEARNING OBJECTIVES:

After studying this chapter, you should know about:

- Difference between Passive management strategies and Active management strategies
- Different kinds of passive strategies
- Different kinds of active strategies
- Smart Beta management strategies
- Factor-based strategies
- Different Investment Management Styles
- Core and satellite investment management approach
- Alpha beta Separation
- Protecting portfolios with derivatives

18.1 Passive Management Strategies

As have been discussed in earlier chapter, asset allocation is an important investment decision. Once the percentage of allocation to equity as an asset class is decided, the portfolio manager has two major options: (i) she can manage the portfolio actively i.e. she can decide on selection of various individual stocks and their weights in the portfolio based on the portfolio objectives or (ii) she can manage the portfolio passively, i.e. simply create a portfolio by imitating a relevant benchmark or invest in an Exchange Traded Fund (ETF) which, in itself, is based on the relevant benchmark, considering the investment objectives.

Under active equity portfolio management, the portfolio manager attempts to outperform an equity benchmark on a risk-adjusted basis, deploying specific investment strategies. Under passive portfolio management, the portfolio manager replicates the underlying benchmark's composition as closely as possible and generates performance close to the benchmark's performance.

Thus, when the Investors' primary objective is to capture the return of broader asset class (e.g. Equity as an asset class) and not to take additional risk to generate alpha, passive portfolio management becomes an automatic choice.

There are many benefits of Passive Fund Management. Some of them are:

- Cost of managing a passive portfolio (both the management fee and the transaction costs) is much lower than an actively managed portfolio;

- It is easier to invest in markets where manager's expertise is low or lacking e.g. an Indian investor investing in the US markets;
- Active portfolio requires elaborate and time-consuming analysis and depends a lot on the expert itself. All of these involve cost at the manager's level;
- Benchmarks are generally diversified, well represented, transparent and liquid.

Passive portfolio management include the following:

18.1.1 Buy & Hold Strategy

When the investor buys a stock/stocks and keeps it over a very long time, it is referred as 'Buy and Hold' strategy. Investor or Portfolio Manager spends time in analysing such companies from every aspect of investment. Once they are convinced of long-term prospects of the company, they buy the stock. Trading, timing and pricing information asymmetry is not the primary objective or concern here. It is expected that in the long run, risk-reward will be favourable and compounding benefit shall accrue. While, Buy & Hold strategy is not mimicking a benchmark, it is often classified under passive strategy as the investment is not frequently traded to gain tactical advantages.

18.1.2 Indexing

When the portfolio manager creates a portfolio, which mirrors an index the process is called Indexing. Indexing is the most common form of passive management. Indexing have gained significant ground in the recent past. ETFs have played big role in the growth of the AUM of portfolios which are indexed.

18.1.3 Comparison between Buy & Hold and Indexing

As mentioned earlier, both the strategies fall under the broad category of Passive Investing. However, there are a few differences:

Buy and Hold	**Indexing**
Identification of stocks and their weight in the portfolio is done by Manager	Stocks selection and their weight simply mirrors the constitution of the benchmarks index
Stocks needs to be analysed by the Manager	Manager's responsibility is to select right benchmark
Negligible trading in the stock	Stocks shall be added, removed or traded as and when Index is rebalanced.
Liquidity, information asymmetry, closure of company, delisting etc. are risks	Index is normally liquid, transparent and has widely traded stocks, which are periodically rebalanced to maintain its relevance.

18.1.4 Indexing portfolio construction techniques

There are many ways of indexing the portfolios. The two major ways are:

- Full Replication, and
- Sampling.

18.1.4.1 Full Replication

When a manager creates a portfolio by holding all the securities in the index with the same or close to same weightages that of a given index, it is called Full Replication. Whenever there is an index rebalancing, manager needs to adjust the portfolio accordingly. Index rebalancing is publicly announced by the index provider.

Full replication is advisable when (i) number of constituents of index is limited, (ii) each constituent is liquid and (iii) portfolio has the threshold minimum size to create such portfolio. Indices like Nifty 50 or S&P BSE Sensex have (i) limited number of stocks, (ii) liquid & tradable stocks and (iii) represents the broad market. It is, therefore, very easy to create a portfolio mirroring these indices.

18.1.4.2 Sampling

When the number of constituents is very large say Nifty500, full replication suffers on two primary fronts: (i) some of the constituent stocks may have low liquidity and (ii) higher transaction cost both due to large number of stocks as well as reinvestment of dividends.
Exchange Traded Funds (ETFs) have negated both the concerns to a large extent for portfolio managers. However, when the inflow or outflow is significantly large, ETFs itself suffer from both the mentioned challenges while replicating the benchmark.

When it is difficult to fully replicate the index, managers try to mirror index by replacing some of the index stocks with the similar stocks e.g. from same sector or industry, similar market capitalisation, similar risk profile etc. In such a case, while the portfolio may not have same/all constituents, but it is very similar to the index in terms of mean-variance (return-risk profile) of the index.

Sampling solves the three major issues of Full Replication:

- Indices with large number of stocks like Nifty500 can be mirrored.
- Index, which has large number of segments including multi country & multi capitalization, also can be mirrored.
- Liquidity and transaction cost of illiquid constituents can be avoided by picking similar stocks which are liquid.
- AUM below threshold level, which is important for full replication of index is possible

18.2 Active Management Strategies

In Active Fund Management style the manager selects securities based on fund's objective, her outlook, analysis and discretion within the overall risk management parameters. The primary objective in active management is to outperform the benchmark and create alpha for the portfolio. Manager invests/trades to take opportunities from the mis-priced stocks. Manager, therefore, over-weights or under-weights on sectors or companies vis-à-vis the index/benchmarks.

Active management requires portfolio manager to spend considerable time in evaluating companies, their financial performance, mispricing of stocks vis-à-vis inherent value, risks etc. to optimise return of the portfolio. Active management, therefore, has (i) higher management cost, (ii) higher (varied) risk than market and (iii) high transaction cost due to frequent trading within the portfolio. The objective of an active manager is to generate return after accounting for cost and risks.

18.2.1 Market Timing

Portfolio managers that pursue an active strategy with respect to the market component of risk are known as market timers. A manager pursuing such a strategy with a forecast of a rising market would raise the risk of its portfolio either by shifting funds from cash to stocks, or by raising the beta of the equities in the portfolio, or by a combination of both techniques. Conversely, a forecast of a declining market would indicate that the manager should decrease the risk of its portfolio either by shifting to cash from equities by decreasing the beta of the equities in the portfolio, or by a combination of both techniques. Market timing strategy is particularly deployed during short-periods of price-value mismatch.

18.2.2 Sector Rotation

As discussed in chapter on Equity, different sectors respond differently to the macro-economic factors. Due to such a complex behaviour, some sectors benefit more than others due to their unique characteristics. When we analyse sectoral performance within the broader index, we find that financial services performed best in a particular period, whereas consumer goods in other period and transportation sector in some other period. Likewise, technology, pharmaceuticals, real estate etc. have their own green and red phases. For example, Covid-19 Pandemic provided favourable gains to Pharmaceuticals and Consumer Staples, whereas Airlines, Hospitality and White Goods etc. faced the lacklustre demand.

When a fund manager, in order to outperform the benchmark, shifts her investments from one sector to another where uptrend is visible or expected, the strategy is referred as sector rotation. Sector rotation is done through increasing or reducing weight of the given sector in the portfolio. Different sectors thrive at different stages of economic cycle. Active manager

looks for such opportunities to ride the cycles with sectors which, according to them, could be potential winners and shunning the losers.

Sector rotation is a 'top-down' strategy where the manager evaluates the macro factors to determine the current phase of economic cycle. And, then the key economic indicators would guide her to identify the advantageous sectors.

On the flip side, sector rotation strategy, at times, lead to higher concentration risk. Also, sector rotation means frequent buying and selling, which results into higher trading costs impacting return of the portfolio.

18.3 The fundamental law of active management

As discussed so far, active managers take a view on the market, sectors and stocks and act accordingly. Such actions are rewarded or penalized depending on the outperformance or underperformance of the portfolio.

In 1989, Richard Grinold and Ronald Kahn, proposed the 'Fundamental Law of Active Management', which predicted productivity of a manager, ex-ante, based on two variables: Skill and Breadth. Skill is measured through 'Information Coefficient (IC)', which is correlation between manager's expected and actual return. 'Breadth' is about how many times such a skill was used in the portfolio in terms of number of independent bets that were outstanding.

Grinold and Kahn, put this in a simple equation, which measured the 'added value' for every unit of risk added in the portfolio and is measured as 'Information Ratio (IR)':

IR = IC * √Breadth

(IR equals IC multiplied by square root of Breadth).
To put in simple words, managers with higher information ratios simply deliver more active return for a given level of active risk. This makes it easy to compare performances across various active managers.

Let us assume that there are two managers, both are equally skilled. The first manager makes 50 outstanding independent forecasts as compared to the second manager's 5. Here, 'outstanding' forecasts is the return after deducting beta adjusted benchmark returns. We can say that the 'breadth' of the first manager is high and will result into higher productivity.

When the manager's productivity for a given level of risk is to be evaluated, the productivity (or value-added) is the specified risk multiplied by the IR. Therefore, the active manager needs

to increase the frequency of utilizing her skills at work, which is positive Breadth, or she can increase the quality of her skill set, which is positive IC.

Let us assume that the manager, in order to improve her Information Ratio, increases number of actions (i.e. bets) in a given period from say 50 to 100, i.e. the breadth is multiplied by 2. Because of this increase in breadth, Information ratio will increase by a multiple of 1.414 (square root of 2). To be more clear let us assume initially the Information Coefficient is 4 and the Breadth is 50. Then Information Ratio = 4 * √50 = 28.2842. Now when the Breadth increases to 100, then the Information Ratio would be 4 * √(50 * 2) = 40, which is effectively 28.2842 * √2 or 28.2842 * 1.414.

However, due to this increase in bets, transaction cost will increase and at times it may be high and impacting the overall portfolio return. So, in order to over-simplify, an important aspect of transaction cost is missed out in the equation.

In India, Information Coefficient is almost non-existent and even if a few managers intend to declare the same, non-availability of data across portfolio managers makes it difficult to compare.

18.3.1 Information Coefficient (IC)

Information Coefficient, as explained earlier, is the measure of manager's skill in terms of accurately predicting the future outcome. This can be for any of the variables such as financial performance of company, macro-economic data prediction, stock price movement, P/E expansion or contraction, business cycles etc.

Information Coefficient is obtained by finding the correlation between expected and actual outcome of strategies. So, information coefficient is essentially correlation coefficient, which like any other correlation ranges from -1 to +1.

An IC of +1.0 indicates that the manager perfectly predicts the future outcome whereas an IC of -1.0 means that the manager always fails to make a correct prediction.

It is important to note here that Information Ratio increases linearly with rise in Information coefficient. So, higher the Information Coefficient, higher will be the Information Ratio.

IC = 2x (Right prediction/Total prediction)-1

If the manager's IC is 0, it indicates that manager has 50-50 chance of going right or wrong, which is no better than flipping a coin. Obviously, in such circumstances no credit will be given to the manager. Finally, like any statistical observation to be meaningful, large number of

observations are required. Small number of observations can lead to results due to chance and not due to skill.

18.3.2 Breadth of Analysis

Breadth in simple terms is the number of times the manager has put his skill to work i.e. number of times action has been taken.

Breadth is therefore:

> **Number of forecasts per period * number of periods for the time horizon in consideration.**

However, two points are important to keep in mind: (i) each forecast is an independent forecast and (ii) forecasts are not correlated. Which means that each bet must be completely independent of other bets to arrive at an accurate Information Ratio of the manager.

For example, a manager makes two forecasts that two technology stocks will outperform because the technology sector will outperform, it is considered as one bet only.

If manager makes quarterly forecast on 11 industry segments, then in a year her breadth is 4 quarters * 11 industry = 44. Information set has to be independent. If they are not, then such duplications have to be removed.

It is important to note here that Information Ratio increases non-linearly with rise in breadth. So, if the breadth is increased, the information ratio will improve only by its square root. For example, if an increase in breadth by 2x, IR will increase by only *v2 i.e. 1.414x.*

18.4 Active versus passive management

As mentioned earlier, Passive manager's objective is to track the benchmark index whereas Active manager tends to outperform the benchmark on a risk adjusted basis. Active manager, therefore, uses her discretion to create a portfolio which will be traded more often as compared to the passive investment manager.

18.4.1 Role of indices in driving passive flows

Globally, equity passive funds are gaining ground over active funds. In US, passive funds AUM has touched $5trillion with more than 7,000 index based products as of March 2020. Likewise, in India too as of March 2020, 86 passive products have collective AUM of $24bn. The same a decade ago was a mere sum of $1bn among 26 products. In both the cases, Indices have played a big role in driving passive flows.

18.4.2 Choice of Index

The choice of index for constructing the passive funds is a crucial one. Indices, therefore, need to satisfy certain conditions to become a good choice for the index funds to mimic such index:

- It should represent the desired market segment,
- It should have a methodology, which is documented and followed without exception,
- It should be transparent, which is critical for investors' confidence in continuity of their investment strategy,
- It should be comprised of widely traded, liquid stocks, which also have high float (i.e. high proportion of stocks which are available for trade), and
- It should be reviewed and rebalanced for changed circumstances on a periodic basis.

Globally, most popular indices are: (i) Broad based index, (ii) Market Capitalisation based index, and (iii) Sector based index.
The categories are (i) broad indices, (ii) sectoral indices, (iii) strategy indices and (iv) thematic indices.

Indexing helps in attracting investors in a transparently created desired portfolio, where manager's discretion is limited. From the random walk theory, we understand that it is impossible to consistently outperform the market and secondly, asset allocation is a major contributor to the overall portfolio return. By investing in passive funds, investor therefore saves on management fee and transaction costs while capturing the broader market/strategy return.

As ETF market is maturing, investors are increasingly opting for passive investments. Since the indices are managed by independent body in a transparent manner, it is easier for the investors to understand the risk-return profile of the fund.

18.4.3 Rebalancing of Index

Index, once constituted, needs rebalancing as companies falling below the threshold are excluded and new companies meeting the criteria are included. However, this is not done abruptly but in a more calibrated manner to ensure that the rebalancing is due to a given change in market and fundamental behaviour of the stock.

Some of the other primary reasons for rebalancing are corporate actions like merger & demerger, suspension of trading, change in category (e.g. inclusion or exclusion from derivatives segment), regulatory action etc. The basic premise of rebalancing is to keep the index relevant in the larger interest of investors.

While index imitating passive funds are expected to simply mirror the index, but when the sheer size of passive funds is large, rebalancing of index creates impact on both the market as well as fund flows within the portfolio.

Inclusion or Exclusion of a constituent (Index Inclusion Effect): Whenever rebalancing in the benchmark results into inclusion or exclusion of a constituent, passive fund managers (those

who are doing *full replication*) will completely exit one constituent and buy according to the weight, the new constituent. This impacts the portfolio, the transaction cost and contributes to the tracking error of the portfolio.

Investors' funds inflows and outflows: A passive fund manager has to invest the inflows in the same proportions as the constituents in the underlying benchmark. The portfolio manager would be required to buy the large weighted stocks in large quantities thus further giving a push to price and valuations. Vice-versa is true when the passive manager is a required to sell a stock when the stock is moving out of the index.

In other words, passive funds flow can influence the prices of securities in the markets. Often such price imbalances are exploited by active managers and result into automatic counterbalancing force.

18.5 Smart Beta management strategies

Smart Beta strategies lie between index mirroring passive management and discretion based active management. Rule-based selection of constituents and creation of index in Smart Beta strategy is similar to the passive strategy. However, rules that are based on market or investment factors such as quality, value, volatility, size, momentum etc., to create index are selected or designed by the manager, which is akin to active management strategy.

Hence, smart beta is referred as an enhanced index-based investment, which tries to exploit market or investment factors to outperform a benchmark index. It has two main attributes:

- **Rule based index construction:** Rules for index are based on single or multiple factors, which are pre-determined and rebalanced periodically.
- **Alternative index weightages:** Index weightages are generally based on some fundamental factors such as sales, profit, book value, cash flow, dividends etc. or can have equal weights or can be based on volatility or momentum parameters.

Besides expressing market views relating to broad economic or fundamental factors, managers use Smart Beta strategies to manage risk and volatility as desired by their investors.

18.5.1 Enhanced Indexing

As against the broader market cap weighted index, smart beta index highlights certain criteria, which do not get highlighted in broad market index for example quality, value, volatility, momentum etc. Smart Beta index takes a systematic and rule-based approach to (i) highlight importance of single or multiple factors in explaining risk-return behaviour over time and (ii) select, weight and rebalance the constituents of index.

Based on manager's outlook, factor's impact and back testing of strategies, constituents are identified and weights are assigned. Manager has certain investment objectives while creating rule for index creation such as:

- Identify mispriced stocks and generate alpha
- Improve risk-adjusted return for the portfolio
- Protect downside risk

Given below are some of the factors and parameters, which manager would focus on:

Factor	**Parameter**
Quality	Return on Equity Return on Capital Employed Return on Assets Cash flow Leverage Strength of Balance Sheet
Value	Price to Earnings ratio Price to Book Ratio Price to Sales Ratio Dividend Yield
Volatility	Beta Variance
Momentum	Price movement over a period

Once the manager has decided what factors to be considered, the process of selecting an index and its weight in the index would therefore be created by the following steps:

a. Score of each (considered) parameter on a pre-determined scale
b. Weight of each parameter
c. Multiply Score with weight (a*b)
d. Sum of weighted score is the score of individual constituents.
e. Constituents are ranked as per their score.
f. Those constituents are selected to be part of index, which are above a threshold.
g. Now, final weights are assigned as per their proportionate score (obtained in step d).

On a regular interval, the index shall be rebalanced in the pre-defined manner. In July 2017, NSE Indices created Nifty Multi Factor Indices[85]. It launched four multi-factor indices, which are:

- NIFTY Alpha Low-Volatility 30
- NIFTY Quality Low-Volatility 30
- NIFTY Alpha Quality Low-Volatility 30
- NIFTY Alpha Quality Value Low-Volatility 30

[85]Source:https://archives.nseindia.com/content/indices/NIFTY_Multi-Factor_Indices_whitepaper.pdf

Each of the above four indices track a portfolio of stocks selected based on combination of 2 or more factors. The factor details along with weights are presented in the table below:

		Factor Weights			
Index	**No. of Factors**	**Alpha**	**Low Vol.**	**Quality**	**Value**
NIFTY Alpha Low-Volatility 30	2	50%	50%		
NIFTY Quality Low-Volatility 30	2		50%	50%	
NIFTY Alpha Quality Low-Volatility 30	3	33.30%	33.30%	33.30%	
NIFTY Alpha Quality Value Low-Volatility 30	4	25%	25%	25%	25%

18.6 Factor-based portfolios

As have been discussed, managers identify factors which drive stock prices and create a rule-based index, which is based on such single or multiple factors. Different managers have different views about the impacting factors and having different investment objectives. This leads to creation of multiple indices to satisfy wider needs of asset managers (e.g. NSE's 4 multi-factor models).

Factor Models are helpful not only in portfolio creation, but it also helps in:

- Attribution analysis of the portfolio[86] ,
- Risk analysis of the portfolios, and
- Decision making while launching new products. Normally, a portfolio manager back-tests her hypothesis of factor models by way of simulation. This helps in fine tuning the final offering besides rejecting hypotheses, which do not pass the test.

While there are many multifactor models existing in the industry, they can be broadly categorised in three categories:

- Macroeconomic Factor Model,
- Fundamental Factor Model, and
- Statistical Factor Model.

18.6.1 Macroeconomic Factor Model

As the name suggests, Macroeconomic Factor model captures those macroeconomic variables, which explains significant part of return. The key macroeconomic drivers are:

- Economic growth (GDP growth)
- Interest Rate
- Inflation Rate
- Credit Risk
- Liquidity

86 Attribution analysis is a tool for portfolio analysis and explains how alpha has been generated. There are three things which contributes to excess return over benchmark i.e. Sector Selection, Stock Selection and Timing. Attribution analysis categorically identifies the contribution of each strategy in overall alpha generation

- Geopolitical climate of country/market

Different macroeconomic variables have different degree of impact on different asset classes. For example, Economic growth and inflation impact equities more directly. Interest rate, inflation and credit risks have significant impact on fixed income securities.

Multi factor model:
Let us look at the equation below, which defines how return of a portfolio is impacted by various variables or factors:

$$Rp_t = (b_{p1} F_{1t} + b_{p2} F_{2t} + \ldots + b_{pn} F_{nt}) + e_{ip}$$

Where,

Rp_t = **the *t*th period return to the portfolio of manager *p***

F_{jt} = **the *t*th period return to the *j*th style factor**

b_{pj} = **the sensitivity of portfolio *p* to style factor *j***

e_{pt} = **the portion of the return variability in portfolio *p* not explained by variability in the set of factors**

Steps to create the portfolio

- Construct the time series of factors
- Estimate sensitivity of the given asset for the given factor surprises using regression analysis. Surprise is defined as the difference between actual and forecasted value. The total expected value of surprise is zero
- Get expected return i.e. the intercept, from expert or econometric estimates
- Weights of each constituents can be equal weight or guided by factor's sensitivities or as decided by the manager

The above model explains return, that has a linear relationship with factors. However, this may not be always true. Some of the non-linear relationship could be power (e.g. quadratic, cubic etc.), exponential, logarithmic etc. Normally, a polynomial regression is used to arrive at non-linear functions but they are complex in nature. Hence a linear relation, which is also a first-order equation, is used for its simplicity and capturing sizable explainable value.

18.6.2 Fundamental Factor Model

When the return's forecast is based on fundamental factors of the securities, the defining model is known as Fundamental Factor model. As mentioned earlier, Quality and Value parameters are called Fundamental Factors.

- **Quality:** RoE, RoA, RoCE, Leverage, Cash Flow, Size etc.
- **Value:** P/E, P/B, P/S, Dividend Yield etc.

Equation for Fundamental Factor is same as Macroeconomic Factor model:
The equation is written as

$$R_i = \alpha_i + b_{i1} F_1 + b_{i2} F_2 + \ldots + b_{iK} F_K + \varepsilon_i$$

Where,

- R_i = the return to asset i
- α_i = Risk free rate (government security yield for the similar maturity is the best proxy for the risk-free rate)
- b_{iK} = Standardized beta of asset i to factor k, where k = 1, 2, ..., K (beta is calculated by dividing the covariance of the stock return versus the market return by the variance of the market).
- F_K = Factor returns for factor k, where k = 1, 2, ..., K (estimated using regression)
- ε_i = an error term with a zero mean (for the portion of the return not explained by the factor model)

18.6.3 Model driven portfolio

Sometimes, managers use mathematical and statistical models to construct a portfolio. They look at (i) time series of various data sets, (ii) set objective (e.g. maximise return or minimise variance) and (iii) decide on the boundary conditions (e.g. restrict maximum loss at -20%, exclude companies where liquidity is below the threshold etc.). As a second step, statistically significant factors are then selected, which are responsible for return generation. In the next step, quantitative models generate weights of each significant factors. Finally, back-testing with multiple scenarios indicates range of the expected outcome.

This method is purely quantitative and driven by statistical results. Human input is restricted to setting boundary conditions and negating those factors, which do not show cause-effect relation even if they may appear to have significant impact on the outcome.

18.7 Momentum Investing

There are investors and portfolio managers who believe that even though the market is random, there are upward or downward trend for some brief period in stock prices. This brief period may extend from a few minutes to a few days or weeks or months.

When a Portfolio manager's investment strategy is based on such continuation of ongoing market trend it is referred as Momentum Investing. Portfolio managers aim at taking a long position in a rising trend, and short position in a declining trend.

Momentum Investing, as the name suggests, depends on price-volume data analysis. It is argued that price-volume data indicates (a) demand supply of the security and (b) collective behaviour of investors in the market. The portfolio manager following this strategy, besides identifying trend, also determines strength of the trend. Momentum investing requires a great deal of discipline, where entry and exit price levels are strictly followed.

Momentum investing has large and growing tribe. Some of the reasons for growing prominence are:

- Easy to understand and follow,

- Market data is easily available at affordable price,
- Analysis is on security or sector or market agnostic, hence analyst do not require expertise on diverse companies, sectors, economy etc.
- Opportunity identification is quick

However, many value investing managers do not believe in momentum investing for simple reasons like (i) they believe that momentum investing returns are random and by chance, (ii) there are no theories to back it up, (iii) it is difficult to convince their investors etc.

18.8 Investment Management Styles

Investment Management styles are broadly classified into two, based on fundamental parameters:

- **Growth Investment Style:** Investing in stocks which have high growth potential and hence outperform the market.
- **Value Investment Style:** Investing in stocks which are undervalued compared to their intrinsic value and therefore provide superior return when mispricing disappears.

There is also a third type of style, *Blended Investment Style*, which combines both the Growth and Value into one.

18.8.1 Growth Investment Style

There are companies, which are expected to grow faster than their peers. The superior growth can come from new products, new market, early stage companies, quality product or service resulting into premium pricing etc. These attributes could result into higher momentum of revenue and/or profitability which, in turn will be reflected in stock prices. Managers, therefore, look for such companies to add in their portfolio.

Future growth is a matter of analytical expectation based on fundamental analysis of a company. This may come from both 'top-down' or 'bottom-up' approaches. The ultimate objective in case of growth stocks is *capital gain*.

Some of the characteristic of identifying growth companies are:

- High future earnings or profit growth,
- Monopolistic or niche product or services with high market share,
- Low dividend yield or pay-out ratio as most of the profit is reinvested in business to fuel growth,
- Higher than peer's valuation,
- Have higher risk parameter compared to its peers,
- Early stage companies etc.

It is important to note here that companies, which are today categorised as 'growth' company, will over a period of time attain steady state growth. Companies continuously innovate and challenge their status quo or complacency.

18.8.1.1 Screens for Identifying Growth Stocks

Thousands of stocks are listed and traded on exchanges. It is laborious task to go through each of the stock and its fundamentals to identify growth stocks. However, in the age of technology, it has become easier to run queries on database to separate companies based on the investment style. While selecting the screen, the following rules and discipline should be followed:

- Define the objective clearly,
- Select primary criteria which matches with desired objectives,
- Set threshold for each primary criterion,

To identify growth companies, following screeners are commonly used as primary criteria by portfolio managers:

- Growth of historical revenue and earnings,
- Forecasted growth, if available
- Industry growth rate

All these numbers are taken for both annual and quarterly growth on year-on-year basis. Besides primary criteria, filters are also used to remove undesired stocks considering investment objective of the portfolio. Some of the commonly used filters are: Market capitalisation, Size of Revenue or Profitability, Leverage (Debt to Equity ratio), Promoter Shareholding etc.

18.8.2 Value Investment Style

As defined earlier, value investors are looking for stocks which are undervalued compared to their intrinsic value. Intrinsic value is arrived at using fundamental analysis of the company's financials and prospects. The objective here is to identify companies, which are below the radar and neglected by the market as compared to their *well-known* peers.

Characteristic for identifying value stocks

- Steady earnings, profit and cash flow,
- High dividend yield or pay-out ratio as business is in matured state,
- Valuation is lower than their peers
- Have Low risk parameter compared to its peers,

Value investment requires much rigorous analysis as compared to any other investment style. Manager must also be aware of value-trap as mispricing may be illusional and company/stock is genuinely worse than what analyst values it to be. It requires analysis of the company, its

management, business etc. over a much longer time horizon to determine sustainability of business fundamentals.

18.8.2.1 Screens for Identifying value stocks

To identify value stocks, following primary criteria (screens) may be used:

- Low Price-to-Earnings ratio
- Low PEG ratio
- Low Price-to-Book ratio
- Low Price-to-Sales ratio
- Low Price-to-Cash Flow ratio
- High Dividend Yield
- Low Debt to Equity Ratio

These screens are used to create security's universe of value stocks which can be further analysed for creating portfolio. Thus, it saves both time and effort at the end of research team as well.

18.8.3 Blended Investment Style

When a portfolio is created which offers both *Growth* and *Value* stocks, it is referred to as Blended Portfolio. This hybrid structure combines the best of both:

- Potential of capital gain from growth stocks, and
- Stability of steady dividend income from value stocks.

Blended portfolio offers diversification to the investor using a single portfolio.

18.9 Socially Responsible Investing (SRI) or Ethical Investing

Portfolio managers are now coming up with investment products, where investment is based on ESG criteria, as increasingly investors are asking more socially conscious investment portfolios. ESG stands for Environmental, Social and Corporate Governance. In layman's terms, investment preference in companies which are socially responsible, environmentally friendly and maintain high level of corporate governance are considered as 'socially responsible investing (SRI)' or 'green investing' or 'ethical investing'.

There are investors who do not want their money to be invested in companies, which (i) creates pollution and degrades environment (ii) operates in 'sin' products like alcohol, tobacco, gambling, weapons etc. and (iii) threatens life, either their employees or society at large such as hazardous chemicals. Portfolio managers may place such constraints while optimizing the portfolio.

This concept of ESG is not new. In fact, analysts and managers, when evaluate companies for their sustainability, ESG play a significant role, directly or indirectly. However, in the recent times, momentum to invest in ESG strategy has gained tremendously. The final push came

when it was realised that 'socially responsible investing' does not compromise return. And, on the contrary, they outperform. India is also joining the bandwagon where asset managers have either launched or preparing to launch ESG funds.

Various research has shown that strategy of buying stocks with high ESG quotient and selling stocks with low ESG quotient yields statistically significant results in its favour as compared to the benchmark index[87].

18.9.1 Identifying Investible Companies and creating SRI portfolio

There are three approaches to create your SRI portfolio:

Negative Screening: Exclusion of companies which are involved in restricted business for example alcohol, tobacco, gambling, weapons, hazardous chemicals etc.

Positive Screening: Rating, scoring and ranking companies for their ESG parameters. And then select companies above a given threshold. Investment objective of the fund will guide priority and weights of each parameters.

Best in Class Screening: It is same as Positive screening except that selection is not highest rated stocks, but highest rated stocks across various sectors. Hence a diversified portfolio is created.

18.10 Core and Satellite Investment Management Approach

As the name suggests, in the 'Core and Satellite' approach, the portfolio is a mix of a large core portfolio and one or many smaller satellite portfolios. The core portfolio is generally managed in a passive manner and reflects the risk profile of the portfolio in the long run whereas the satellite parts enables the portfolio manager to capitalize short term opportunities in the market. Core portfolio helps in minimizing the costs whereas satellite portfolios enhances return. A portfolio generally have about 70% to 80% of the core portfolio and balance in the satellite parts.

Characteristics of core and satellite portfolio:

Characteristic	Core	Satellite
Objective	Discipline and stability of investments (strategic investment)	Opportunistic and experimental (tactical allocation)
Share in portfolio	Majority and hence called core	Smaller fraction
Activity level	Portfolio turnover in this part is much lower	Portfolio turnover in this part is much higher

[87] The effect of socially responsible investing on portfolio performance' by Kempf, Alexander; Osthoff, Peer published in Econstor 2007

Trading	Negligible Trading	High level of trading in portfolio
Cost	Small management fee and trading costs	Active management fee will be high along with high trading cost
Type of fund	Passive preferred	Active preferred
Holding period	Long term (also benefits in terms of long-term capital gains)	Frequent trading will attract short-term capital gains
Volatility	Low volatile (market beta)	High volatility
Performance measure	Minimise Tracking Error	Optimizing mean-variance i.e. risk-adjusted return

The reasons for this approach to become popular are:

- It is a very intuitive way of investing
- Combines and benefits from best of both active and passive management

18.11 Alpha Beta Separation

Return from an investment portfolio can be deconstructed into two of its risk drivers: Systematic (market) risk and unsystematic (non-market) risk.

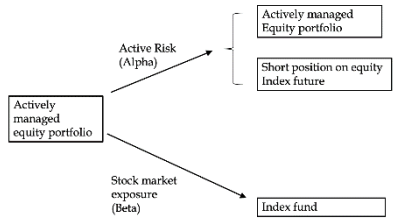
The return due to exposure to the market risk is beta return and to the non-market risk is alpha return. A passively managed portfolio generates only beta return whereas actively managed portfolio aims to generate alpha return along with beta return. By using sophisticated investment strategies, it is possible to separate alpha and beta decisions.

Beta drivers will determine a fund's overall exposure to the financial market and govern the overall risk profile of the fund as well as its expected return (as beta risk establishes a fund's overall exposure to the financial market)

Alpha drivers will exploit discrepancies when markets are misaligned – this is a tactical bet to outperform the benchmark. Alpha drivers are identified by their high tracking error to a benchmark or by their lack of a benchmark.

Given below is an example of alpha and beta separation:

Decomposition of Risk in an Active Equity Portfolio



As shown in the example, the portfolio manager is a taking a (1) long position on active portfolio and (2) taking a short position on market neutral portfolio. The resultant portfolio will have exposure only to alpha and not beta. Simultaneous she may take exposure to a desired beta risk through a passively managed portfolio. Hence as can be seen the alpha and beta decisions are separated and generated though different portfolios.

This separation can also be termed as Portable alpha (when long-short strategies are in two different asset class or markets) or Alternate beta.

18.12 Constructing Equity Portfolio with Derivative Securities

There are two major challenges in equity investments: (i) price risk, which is risk of falling price and impacting our portfolio returns and (ii) volatility of the portfolio i.e. accepting a risk which is higher than investor's or portfolio's risk objective. Both these challenges are inherent to equity investments. However, use of derivatives can help in containing both the risks.

Uses of derivatives in managing equity portfolio helps in many ways:

- It can be used to hedge against adverse price movement,
- It allows to take advantage of short-term views and taking exposure in assets or securities (tactical allocation),
- It gives leveraged position, hence boosts alpha significantly compared to cash equities,
- Balancing the portfolio to manage overall equity exposure without buying or selling stocks in cash segment,
- Fund managers can translate their views on market into action without disturbing the core portfolio.

However one needs to remember that derivatives are just a tool, which can cut both ways and hence discipline, control and monitoring are critical while using derivatives.

Derivatives can be used in variety of ways in portfolio management:

Generating Alpha

Suppose fund manager identifies that mid-cap stocks are likely to outperform in the short-term. The portfolio manager can buy either call option or buy futures on mid-cap index. Since, both the call option and futures are leveraged positions, large alpha can be generated for small exposure. If the fund manager's view is correct, the excess return generated will be high. If the fund manager's view is wrong, loss in call option is limited to premium however, in futures, it would be linearly equal to the fall in index.

Hedging

When a portfolio manager who is managing a diversified equity portfolio, believes that market is likely to fall and wants to protect her portfolio against this fall, she can sell index

Futures. If fund manager's view is correct and market has fallen by 10%, then (i) value of portfolio will decline in line with market (ii) value of Nifty Futures, which was sold earlier, will make a gain of 10%. Thus, the value of overall portfolio is hedged.

Arbitrage

Arbitrage is nothing but opportunity to make risk-free profits due to price differential in two markets. Difference in cash and future segment of market provides arbitrage opportunity. If cash market index is at 10,000 and it is available in future markets at 10,100 expiring in one month. Then the simple arbitrage is to buy at 10,000 in cash market and sell at 10,100 in futures segment. Let us assume that leverage is 10:1, so margin requirement is 1,010. Now, irrespective of the price movements, this gain of Rs.100 is locked. From the gain borrowing cost and transaction costs need to adjusted.

18.13 Protecting Portfolios with Put Options

The most common protection against loss on existing portfolio is buying a put option. It is also known as *Protective Put* given the fact there is a portfolio to be protected. (The other form of put option is, *Naked Put*, where put option is taken for either trading or speculation without any portfolio to be protected).

Protective Put offers insurance to the portfolio (or stock) and comes with a cost, called premium. The stock price or index level at which protection is provided is known as strike price.

An example is given for understanding this concept:
Suppose the portfolio manager has bought 100 shares of Reliance Industries at Rs.2,000 per share. If she wants to protect the value from decline in market price of shares. She can buy *Put Option for One month* with a strike price of Rs.2,000 by giving a premium of Rs.25.

Scenario I: Stock price goes below to Rs.1,900

The Put Option that she has purchased gains by Rs. 100 (i.e. 2000-1900). But since she has paid premium of Rs.25, net gain is Rs.75. At the same time the loss on the manager's underlying portfolio is Rs.100 per share. However, the net loss comes to only Rs.25 i.e. the loss on the portfolio 100 and the net gain on the put option 75. If there was no Put Option, then the loss would have been Rs.100. This is the way options lock the downside only to the extent of the premium paid.

Scenario II: Stock price goes up to Rs 2,100

The Put Option that she has purchased expires without exercising. On the other hand, gain on the portfolio is Rs.100 per share. But since she has paid premium of Rs.25 to buy Put Option, the net gain is Rs.75 i.e. gain less the premium she has paid.

18.14 Global Active Strategy

In a domestic portfolio, allocation is made to different sectors and asset classes to achieve diversification portfolio. For reaping the benefits of diversification further, portfolio can be diversified globally across different countries and geographies. Such portfolio will diversify away country specific risk.

While investing globally, investors exhibit home-bias given natural advantage in terms of knowing businesses, products & services, laws & regulations and most importantly consumer behaviour.

18.14.1 Global market for equities

While US markets accounts for more than 50 percent of market capitalisation[88], emerging markets also offer nearly 10% of global market capitalisation and frontier markets have a small share. Importantly, emerging markets are across continents i.e. America, EMEA (Europe, Middle East, Africa) and Asia. Each market within 'emerging category' is unique in some sense while common in others. This enhances the opportunities of diversification.

There are two broad ways to invest internationally: one through investing in the companies in their home country which have global operations and global presence and secondly through investing in global equities either through funds like ETFs or in direct equities.

18.14.1.1 Benefits and costs of globally diversified portfolios

While investing in international market is desirable, it comes with its own benefits and costs. Some of them are listed below:

Benefits	Costs
• Diversification of country specific risks • Superior risk-adjusted return • Achieve tactical allocation to exploit opportunity	• Liquidity Risk • Geopolitical Risks • Currency Risks • If investing directly, then regulatory cost is high • Delay in information transmission can cost portfolio returns

18.14.2 Emerging markets equities versus developed market equities

Equity investment philosophy and theory applies to developed markets and emerging markets alike. However, there are some uniqueness in both the categories. Some key differences are summarised below:

[88] https://www.statista.com/statistics/710680/global-stock-markets-by-country/

Characteristic	Developed Market	Emerging Market
Size	US market alone contributes more than 50% of global market cap. Adding other developed markets, this share increases over 80%. Organized market is functioning for over 150 years now.	Emerging markets have a market capitalisation share of approximately 10%. History of organised market is shorter compared to developed markets.
Geography	US, France, UK, Germany, Japan, Australia, Hong Kong, Singapore etc. are key developed markets	China, India, Russia, Brazil, Korea, Argentina, Mexico, Taiwan etc. are key emerging markets
Liquidity	Liquidity in developed markets is high, hence the impact cost is low	Emerging markets are considered to be less liquid and hence impact cost can be high
Transaction Cost	Lower transaction cost helps better resource allocation	Transaction costs are high compared with developed markets.
Products	Have wide range of products for creating exposure	Limited products
Maturity	Market is matured in terms of investor awareness, information absorption in price, systems and processes etc.	Emerging markets have evolved a lot but are relatively less efficient
Investor Protection	Investor protection had started early. Both law and company's policies favour investor protection in practice.	Rule and laws are evolving to protect investors. However, enforcement is still weak.
Interest Rate	Both inflation and interest rates are low and stable	Both inflation and interest rates are high and volatile
Governance	Governance norms are stricter and penalty for violation is severe. Companies understand the importance of ESG better.	Governance norms are evolving.
Data Availability	Not only long historical data is available but also easily accessible	Data availability remains an issue.
Transparency	Pricing, general financial and corporate information, laws & regulations are evolved and transparent	Transparency is improving with time, but it will take time to match developed markets.

18.14.3 Market capitalization versus GDP

When we analyse stocks, one of the objectives is to find out whether the stock is undervalued or overvalued to its intrinsic value. The simplest way to find out is through peer valuation using ratios like price-to-earning, EV/EBIDTA, price-to-sales etc. Likewise, Market Capitalization to GDP is a ratio to determine whether a country is undervalued or overvalued to (i) its own historical values or (ii) its peer countries. The underlying assumption in both the cases is that price would adjust itself to reflect value and therefore, undervalued markets will generate superior returns and overvalued markets will underperform. It also is used to predict expected return from the market.

It can be expressed with the following equation:

Market Cap to GDP = $\frac{\boldsymbol{Market\ Capitalisation\ of\ all\ the\ listed\ companies}}{\boldsymbol{GDP\ of\ Economy}}$ **x 100**

Chart 18.1: Wilshire 5000/ GDP for US Market[89]

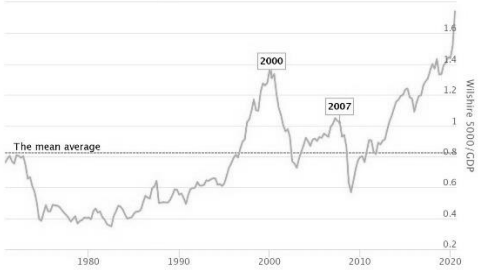


Chart 18.1 shows US market capitalisation to USA GDP, where market capitalisation is estimated by Wilshire 5000 Index, which is more broad-based compared to S&P 500 or Dow Jones 30 and reflect most of the publicly traded companies in USA.

Chart 18.2: Market Cap/ GDP for Indian Market[90]



It can be seen in Chart 18.2 that Indian market cap to GDP ratio is lower compared to USA market.

[89] Source: https://www.longtermtrends.net/market-cap-to-gdp/
[90] Source: https://www.gurufocus.com/global-market-valuation.php?country=IND

Portfolio manager's track this ratio for fresh tactical allocation when this percentage is, for example, below 50% and sell when the ratio moves beyond 100%.

As is known, earnings in P/E ratio is impacted by business outlook, capital structuring, quality & governance, research & development, brand & marketing etc. of the company. Likewise, GDP of an economy is reflection of various constituents of the economy. GDP data goes through serious scrutiny by analysts, economists, government, inter-governmental agencies etc.

The table below is an indicator (only a thumb rule) to determine undervalued or overvalued level:

Mkt Cap to GDP Ratio	**Interpretation**
Less than 50%	Undervalued
50% to 75%	Moderately Undervalued
75% to 90%	Fairly Valued
90% to 110%	Moderately Overvalued
More than 110%	Overvalued

18.14.4 Home (Familiarity) Bias

As discussed earlier, it is not unusual for the investors to invest in companies which are in the same geographical region as that of the investors. It is a global phenomenon. While US market represents 54% of world's total market capitalisation, average US person invests approximately 80% in US markets.

As per a Vanguard report published in 2017, below table shows the home-bias in various countries:[91]

Country	**Global Index Weight (%)**	**Investor holding in domestic country (%)**
USA	50.9	79.1
Canada	3.4	59.0
UK	7.2	26.3
Australia	2.4	66.5
Japan	7.2	55.2

Similarly, Indian market is merely 2% of global market, but average Indian Investor's exposure to global market is negligible. While regulation was one of the reasons for Indians to invest in domestic market, familiarity with domestic environment and bias towards local companies is the main reason towards such miniscule overseas investments. But this is changing. Recent

[91] Source: https://personal.vanguard.com/pdf/ISGGAA.pdf

experience suggests that investors are increasingly diversifying with overseas funds both due to emergence of ETFs and government allowing $250,000 per year for overseas investments.

Some of the reasons for home-bias are:

- **Familiarity:** with the companies, law, regulation, taxation, market, products & services etc. gives comfort to investors
- **Optimism:** towards growth in local economy and companies
- **Risks:** such as currency, geo-political of investing overseas
- **Predictability:** is high or perceived to be high given both familiarity and optimism

Home bias, however, leads to two major disadvantages:

- Concentration of portfolio and
- Missing out on diversification opportunities

18.14.5 Implications of rise of Index Funds on cost of portfolio management, investor returns and implications for Active Management

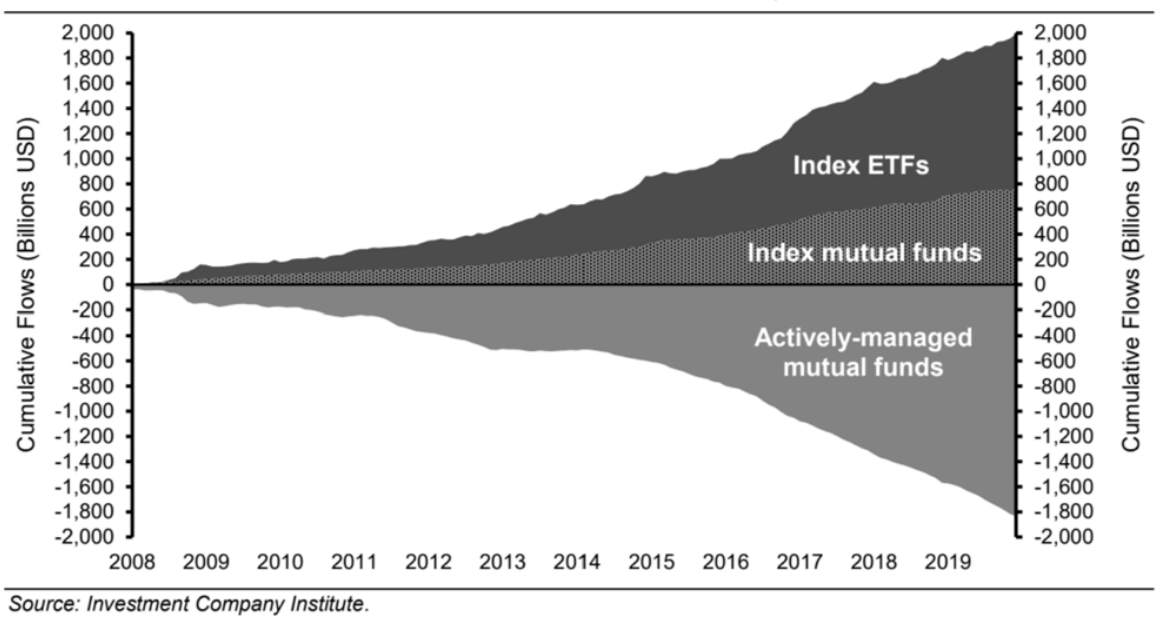
The rise of passive funds or index funds is for two reasons: (i) difficult to outperform index consistently over a long period of time by the active managers, and (ii) availability of variety of low cost index funds and ETFs have made it easier for investors to invest in their preferred choices, both domestically and internationally.

As discussed earlier, Index fund has the following characteristics:

- Portfolio of Index fund mirrors a particular index e.g. Nifty 50 Index Fund. Fund manager's role is limited to track the index in the portfolio.
- Since there is no active management, cost of such index funds is low for investors.
- Performance of index fund is measured in terms of 'tracking error', which is the difference between benchmark index and the index fund.
- There is very limited amount of trading in the portfolio which is limited to either fund flows or due to the periodic change in index constituents.

The concepts such as 'Core and Satellite Portfolio' and 'Alpha Beta Separation' are further fuelling the growth of passive or index funds. Even active fund managers are now taking exposure to select sector or market cap or countries using index funds. All these results into a massive change of flow from active to passively managed index funds. The chart below shows the flows, which clearly indicates that passive fund flows are growing at the cost of active funds.

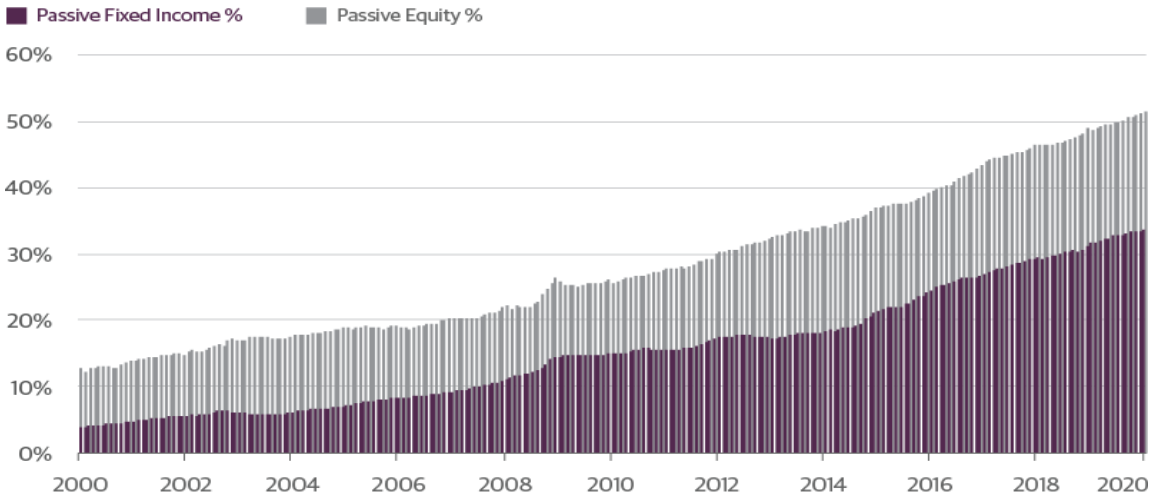
Chart: 18.3 Cumulative flows from US Active to Passive Funds (2008-2019)[92]



Source: Investment Company Institute.
Note: U.S. domestic equity funds; Mutual fund data is net new cash flow plus reinvested dividends; ETF data is net share issuance and includes reinvested dividends.

This has resulted into passive funds in equities capturing now more than 50% share.

Chart 18.4: Passive fund assets are rising faster in Equities[93]



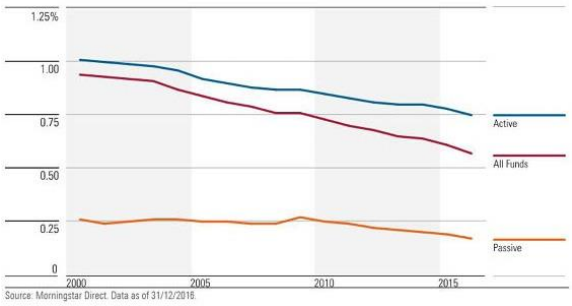
Passive funds have the following impact on the overall industry including active funds:

- Overall management fees have come down with investor's preference gravitating towards low-cost passive funds. Saving in management fees is directly accrued to the investors' return. Given the long-term nature of investments, such saving has significant impact in dollar terms and hence the shift appears justified.

[92] Source: https://nationandstate.com/

[93]Source: https://www.guggenheiminvestments.com/perspectives/portfolio-strategy/index-tracking-passive-strategies-fixed-income

Chart 18.5: Asset weighted fund fees in US markets[94]



- Fund flows clearly shows that actively managed funds are losing money to passively managed funds.

However, it is important to note here that flows into passive funds may lead to artificial price rise (due to demand and not strictly due to value) as it favours large cap. This leads into a vicious cycle of continuous price rise for mega and large cap companies. Which means, the mispricing can be exaggerated to an unsustainable level. In such a case, active managers would reverse the trend by dumping significantly overvalued stocks.

[94]Source:http://srt.morningstar.com/newsp/cmsAcontent.html?t=MFLDX&resourceId=810017&src=Morningstar&date=05-23-2017&nav=no&region=USA&culture=en-US&ProductCode=mle

Chapter 18: Sample Questions

1. Which of these is NOT correct with respect to passively managed equity portfolio?
    a. Stocks are fairly valued following efficient market hypothesis.
    b. Passive management requires less time and cost compared to actively managed portfolio.
    c. Market timing is important in passive management.
    d. It is difficult to replicate benchmark with large constituents due to low liquidity of some of the constituents.

2. While managing equity portfolio, a portfolio managers aims at taking a long position when the market is rising and takes a short position when the market is in a declining. This strategy is referred as:
    a. Momentum investing
    b. Factor based investing
    c. Value investing
    d. Growth investing

3. Globally, growth of passive funds has surpassed that of the active funds. What could best describe the growth of AUM of passive funds?
    i. Core and Satellite Portfolio
    ii. Alpha and Beta Separation
    iii. Flexibility of Tactical allocation
    iv. Downside is protected using long put option
    a. I only
    b. I, II and IV only
    c. I and II only
    d. All of them are correct

4. Which among the following is (are) NOT part of passive management style of equity portfolio?
    i. Smart Beta Portfolio
    ii. Factor Based Portfolio
    iii. Growth Style Investment Portfolio
    iv. Value Style Investment Portfolio
    v. Momentum Investing
    a. I and II only
    b. III, IV and V only
    c. I, III and V only
    d. II and IV only

5. To identify value stocks, following primary criteria (screens) may be used:

a) Low Price-to-Earnings ratio
b) Low PEG ratio
c) Low Price-to-Book ratio
d) All the above

Sample Caselets

1. A PMS manager predicts prices of 30 stocks in a quarter of a normal year, each one coming from a different industry. During the previous one year he was successful in predicting 25,30,28,20 stocks respectively in the four predicting periods. How good is the manager in predicting? What metric would you like to use for the same? (round off to two decimals)

a) 0.72; Information Coefficient
b) 0.72; Information Ratio
c) (-)0.28; Information Coefficient
d) (-) 0.28 Information Ratio

Answer: a) 0.72; Information Coefficient
Explanation: IC = [2 * (25+30+28+20)/120] - 1 = 0.72
Information coefficient=[2*(Right Prediction/Total Prediction)]-1

2. A PMS manager predicts prices of 20 stocks in a quarter of a normal year, each one coming from a different industry. During the previous one year he was successful in predicting 15,20,18,10 stocks respectively in the four predicting periods. What is the breadth of this manager and how much would be her Information Ratio? (round off to two decimals)

a) 8.94 and 5.14
b) 8.94 and 5.75
c) 5.14 and 0.575
d) 5.14 and 5.75

Answer: a) 8.94 and 5.14
Explanation: IC = [2 * (15+20+18+10)/80] - 1 = 0.72 =0.575; Breadth = root over 80 = 8.94 ; Information Ratio = 0.575 * 8.94 = 5.14

3. A Portfolio Manager is interested in protecting his portfolio of value Rs 200 million using options contracts available in the market. He calculated that he needs to pay a premium of Rs 5 Mn in order to fully hedge his portfolio. What kind of options contracts would he use to get the desired protection to his portfolio? If the value of portfolio drops by 10% by the date of maturity, what would be the loss mitigated because of the options?

a) European Put Option, Rs.15 Mn
b) European Call option, Rs.15 Mn
c) European Put Option, Rs.20 Mn
d) European Call Option, Rs. 20 Mn

Answer: a) European Put Option, Rs.15 Mn
Explanation: The “no hedge” situation would result in a loss of Rs 20 Mn in the portfolio value (= Rs 200 Mn * 10%). But when the portfolio value falls by 10%, his put options would gain 10% (i.e., Rs 20 Mn gain from the options position), that would fully compensate the loss in

portfolio value. However, as he has already paid a premium of Rs 5 Mn to set-up this options position, adjusting for this premium cost, he would have mitigated a portfolio loss of Rs 15 Mn (= Rs 20 Mn – Rs 5 Mn).

CHAPTER 19: FIXED INCOME PORTFOLIO MANAGEMENT STRATEGIES

LEARNING OBJECTIVES:

After studying this chapter, you should know about:

- Different types of bond portfolio strategies
- Difference between active and passive strategies
- Interest Rate driven strategies
- Valuation driven strategies
- Credit analysis
- Yield spread analysis
- Constructing bond portfolios with derivative securities

19.1 Introduction to fixed income instruments

Fixed income instruments are debt instruments, which provides returns in the form of coupon (or interest) and principal at the end of the maturity period. Return from the fixed income instruments are more predictable as compared to equity assets. Investors prefer fixed income securities primarily to match their own liabilities and stable returns.

When the portfolio is constructed with securities, which belongs to the category of Fixed income securities, it is called fixed income portfolio. Some of the examples of fixed income securities are Government Securities, Corporate Bonds, Debentures, Commercial Papers, Certificate of Deposits, Treasury Bills and Tri Party Repos (TREPS).

Investing in fixed Income securities have lower risk compared to equity investments. Globally, size of fixed income investments overshadows equity investments. Large institutions, sovereign funds, endowment funds, pension funds, insurance companies, banks etc. prefer to keep a large portion of their investments in fixed income securities. Globally, governments are the largest borrowers through fixed income markets. These borrowings are spent on roads, power, defence, ports, education, healthcare, agriculture etc. Thus, fixed income markets contribute to economic growth and welfare.

The generic classification of fixed income portfolio strategies is similar to equity portfolio management strategies; however at granular level they are different due to differences in the nature of equity and fixed income securities. The different strategies for managing fixed income portfolio are discussed subsequently.

19.2 Passive management strategies

Passive Management, as the name suggests, indicates that investor does not exercise discretion to select securities. The three different passive management strategies to manage bond funds are: Buy and hold, Indexing and Immunization.

19.2.1 Buy and Hold

The most basic form of passive management is a buy and hold strategy. Once a strategy is devised and securities are identified, the investor buys and holds the investment till maturity. The primary objective in this strategy is to lock the current yield (i.e. return) irrespective of price movement. A simple example of buy and hold strategy is given in Illustration 19.1:

Buy and Hold Strategy with Single Security

To understand it clearly, let us assume that the investor has invested Rs.1,00,000 on 01/01/20 in a 5-year bond which offers 8% coupon semi-annually. The cash flow will be as follow:

Illustration 19.1: Buy and Hold Strategy with Single Security

Date	Cash Flow	Yield on the date of Coupon Payment (%)
01/01/20	(1,00,000)	8.00%
30/06/20	4,000	7.90%
31/12/20	4,000	8.00%
30/06/21	4,000	7.75%
31/12/21	4,000	7.50%
30/06/22	4,000	7.25%
31/12/22	4,000	6.90%
30/06/23	4,000	6.40%
31/12/23	4,000	6.30%
30/06/24	4,000	5.60%
31/12/24	1,04,000	5.50%

Note the following:

Negative cashflow (1,00,000) on 01/01/20 indicates investment made in the bond. Whereas other cashflows indicate receipts in the form of coupon payments. Last cashflow on 31/12/24 indicates receipt due to coupon and principal repayments. We can see from illustration 19.1 that even though the yield (or market interest rate) on the various coupon dates are different as compared to the originally contracted yield (of 8%), the investor continues to receive the originally contracted rate. However, the coupon payment suffers from reinvestment risk as the coupon payment received is invested at the ongoing yield assuming the maturity of the coupon investment is also same as that of the original instrument at 31/12/24. This arises because YTM assumes that the intermittent coupons are re-invested at YTM till maturity.

In this example, after the initial investment, there is no in-between sale or purchase involved. The investor will receive coupons and principal amount on stated dates. Because there are no subsequent trades (sale or purchase) involved, the investor will not experience any price risk. Even when market yields move up and down (hardened and softened) continuously during the said period in the market.

This is a classic case of Buy and Hold strategy of a fixed income security. As can be observed in the above example:

- The investor will receive returns exactly as per the initial expectations at the time of investment and there are no negative surprises which could have impacted the return.
- The investor has avoided any speculations on the future interest rate movements.
- The investor has received all cashflows as expected.
- The risk is only towards reinvesting the coupon payments (i.e. reinvestment risk) at matching yields.
- The investor will not incur any intermittent transaction costs since there are no trades in-between investment and maturity date except for the coupon payments, which shall attract transaction cost if invested again (alternatively no transaction cost if the received coupon is used for other purposes).
- The cashflow and hence the return was both predictable and stable (except to the extent of coupons, which still carries the reinvestment risk).

Buy and Hold Strategy with Portfolio of Securities

Similar to the 'Buy and Hold' strategy with single security, a portfolio can also be created with Buy and Hold strategy. In such a portfolio, each security is held till its maturity. This way the portfolio's originally contracted coupon amount are fixed. Either all the securities are bought on day one itself or the securities can be added as and when cash flow is received by the investor. At times, even the securities are of same maturity and therefore are co-terminus. Mutual Funds have series of Fixed Maturity Plans with the same philosophy. Let us look at the example given below:

Illustration 2: Buy and Hold Strategy with Portfolio of Securities

	Issuer 1	Issuer 2	Issuer 3	Issuer 4	Weighted Avg. Yield
Issue Date	01/01/20	01/01/20	01/01/20	01/01/20	
Maturity Date	31/12/25	31/12/25	31/12/25	31/12/25	
Coupon Rate	7.75%	8.00%	8.25%	8.50%	
Credit Rating	Sovereign	AAA	AA+	AA	
Weight- Scenario I	25%	25%	25%	25%	8.13%
Weight- Scenario II	40%	30%	20%	10%	8.00%
Weight- Scenario III	10%	20%	30%	40%	8.25%

Here again, for simplicity, we assume that the yield mentioned is achieved as (i) there is no reinvestment risk for coupons received, (ii) securities are issued at par value, (iii) credit rating does not change during the holding period and (iv) there are no defaults by the issuer, which adversely impact the price (and hence yield) of the securities.

In the above given example, a Portfolio Manager is constructing a portfolio with these four securities. In scenario I, equal weight is assigned to all the four securities. Weighted average yield thus arrived is 8.13%. In Scenario II and III, the weighted average yield is 8.00% and 8.25% respectively. It is easy to observe that Scenario II is low risk-low return strategy given its high credit quality portfolio. Likewise, Scenario III is a high risk-high return portfolio.

In all these cases, yield is assured when the portfolio is not disturbed throughout its life till 31/12/25.

This is a Buy and Hold Strategy at a portfolio level. In these scenarios too, no call on future interest rate movement is taken into consideration and thus price risk is mitigated. It is important to note here that reinvestment risk of coupon payments still exists with this construction of portfolio.

On maturity date, the portfolio automatically extinguishes and the proceeds are either returned to the investor or invested in a new portfolio created based on same objectives.

- As the name suggests, securities are bought and held till maturity.
- This way, yield of the bond/portfolio is fixed in the beginning itself.
- There is no impact of future interest rate movements.
- Cashflows are predictable. To avoid cashflow losses, in the Buy & Hold strategy, high quality bonds are preferred.
- Coupon payments are received as per the terms (also known as Covenants) of the bond(s).
- Reinvestment risk with respect to coupon payments still exists.
- Buy & Hold strategy reduces transaction costs.
- It helps in stabilizing income and hence used by large institutions globally. Unless required, most of the institutions hold their bonds till maturity to predict their cash flow with high certainty.

19.2.2 Bond index funds

Another passive management strategy is indexing. This basically means that the portfolio has same or similar securities, which the benchmark has, and in the same proportion or weight. So, the role of the Portfolio manager is to only mimic the Benchmark/Index closely. The Benchmark/Index is pre-defined.

Reasons to adopt Bond Index Funds

Bond Index Funds are considered for the following reasons:

Portfolio Mandate: When the objective or mandate of the portfolio is to mirror a particular benchmark, the Portfolio Manager has obligation to honour the same. The mandate from the investor(s) itself can be due to many reasons as investors also diversify their assets and one such part is to invest as per a particular benchmark. Imagine a global investment manager managing large endowment fund and has decided to invest 5% into Indian fixed income market. Since, the objective of the global investment manager is to benefit from investing in India as an asset class, it would opt for a suitable benchmark to be replicated. It can engage a local partner to manage this investment exposure through bond indexing.

Management Fee: The cost of managing an index fund is very small compared to an actively managed fund. Role of a Portfolio Manager is to simply mimic the benchmark index. And unless there are (a) inflows and outflows in the portfolio and (b) change in benchmark index composition, there is no decision making or transactions involved by the Portfolio Manager.

Ease of replication: Construction of Benchmark Index follows certain rules, which itself takes care of factors like liquidity, size, weight, issuer, credit rating etc. Periodical rebalancing of benchmark index takes care of inclusion or exclusion of securities as and when necessary. This removes the burden of active management for the Portfolio Manager.

Availability of Choice: There are many bond Indices available today (discussed in chapter 1) across categories e.g. sovereign bond index, corporate bond index, long duration G-Sec index, commercial paper index etc.. Indices are also based on maturity, duration, credit rating, issuer category etc. Such indices offer readymade choices to the portfolio manager to invest. Also, sometimes a portfolio is created by combining various indices in a certain proportion.

Liquidity Risk Mitigation: An exchange traded fund can be easily created by mirroring a benchmark index. The recently launched Bharat Bond ETF is one such example, where the ETF mirrors an index and also tradable on stock exchanges. This significantly reduces the liquidity risk for the investors.

Benefits of a Benchmark

Explicit, Transparent and Unambiguous: A benchmark's constituents are well defined in advance in terms of name of securities and their weights. This makes it transparent to all including the portfolio manager and the investor. The value of the benchmark is publicly available and the price reflects the tradable value of the index.

Tradable Securities: Benchmark is generally comprised of tradeable as well as liquid securities. To maintain the currency of a benchmark, securities are periodically reviewed and

the decision of inclusion or exclusion of a particular security is taken accordingly. Even the methodology of such rebalancing is defined in advance to remove any ambiguity at a later stage.

Daily Price Availability: Benchmark price is publicly available, including its historical prices. This helps in evaluating the risks and performance of the benchmark, which in turn helps in identifying the suitable benchmark for the portfolio.

How to Select a Benchmark?

Selection of a right and suitable benchmark is a first step in passive management. Any mismatch in such selection can defeat the entire purpose of passive management and result in mismatch of investment objective and portfolio creation to achieve the objective.

Investment objective and risk appetite of investor are the two most important guiding posts for the selection of a Benchmark. Depending on the time horizon, a low-, mid- or long-duration index can be selected. Some indicative benchmark selection for given objective are:

Objective	**Benchmark**
Risk-free long-term investment	G-Sec Index
Short-term cash management	Liquid Index
Income objective	Long Duration + Aggregate Index
Low Risk Appetite	Low Duration + High Credit Quality Index
Inflation Risk Mitigation	Floating Interest Rate Benchmark

Performance Tracking in Passive Management

As discussed earlier, passive management is nothing but mirroring a suitable benchmark. Objective is not to outperform the index, but to generate return equal to the benchmark by keeping risk similar to the index.

However, for various factors, point-to-point tracking of index is often not possible, which results into 'Tracking Error' of the portfolio. Tracking error is the difference between the performance of the portfolio vis-à-vis the benchmark it is tracking. A lower tracking error is obviously preferable. A large tracking error indicates that either the benchmark is difficult to replicate (liquidity, frequent changes, rating changes etc. are some of the reason) or portfolio manager is slow in reacting to such changes.

Factors affecting Tracking Error

There are some genuine reasons why tracking error is present:

Costs: Expense Ratio or Asset Management Fee along with the transaction costs lower the net asset value (NAV) of the portfolio, which is absent in case of benchmark.

Similar but not the same security: When the portfolio holds securities, which are similar in nature i.e. representative and not the same security which is available in the benchmark, tracking error can happen. Sometimes, this situation arises due to low liquidity of the benchmark security and the portfolio manager is forced to select a similar but not the same security.

Weight difference: Again, due to various reasons, the portfolio manager is forced to select a security with a different weights as compared to the security's weight in the index.

Illiquid Security: Illiquid security has large bid-ask spread and in such a case the fund's buying or selling price can be different from the market indicative price. This again results into tracking error.

Regulatory Constraints to avoid concentration risk: Sometimes benchmarks have large concentration of particular issuer, when a security's weight is assigned as per the issuer's size or market capitalization or turnover etc. Whereas the portfolio manager has to adhere to the regulatory guidelines and avoid concentration of any particular issuer. In such a case, portfolio manager is forced to select an alternative security. This in turn results into tracking error.

Cash in Hand: Portfolio manager has to keep cash for various reasons including liquidity, unexpected inflows and outflows, odd-lot cash (e.g. having Rs.4 crore in cash when the investing lot is Rs.5 cr) etc whereas benchmark do not have such limitations and are constructed on fully invested basis.

19.2.3 Immunization

Immunization is another form of passive management of bond portfolio. Investors investing in bond portfolios face interest rate and re-investment risk. Immunization is a process to protect the return or yield of the portfolio against future interest rate movements.

Immunization using a Zero-Coupon Bond

The simple way to immunize is to invest in a zero-coupon bond with matching maturity i.e. maturity equal to the liability time-frame. When investor invests in zero-coupon bond, investor locks the future value without any interest rate risk or reinvestment risk. Assuming the interest rate for 10-year horizon is 10%, cost of zero coupon bond with a face value of Rs.10,00,000 today is Rs 385,543.30.

Current Price of zero coupon bond = Future value/ $(1+r)^n$

As the name suggests, a zero coupon bond does not offer any coupon payments during the tenure of the instrument. Zero coupon bonds of long tenure carries higher risks for the issuer

and hence now-a-days seen rarely. However, bank's fixed deposits (in its simple form) still replicates a zero-coupon bond except for the fact that bank's fixed deposits are not tradable.

Immunization using a portfolio of bonds

The alternate method is to create a portfolio of bonds whose weighted average duration meets the time-horizon of liability. In the given example, a bond portfolio is to be created in such a manner that the Macaulay Duration of the portfolio is equal to 10 years. On any given date, value of the bond portfolio will depend on two things:

a) Value of the bonds in the portfolio based on existing interest rate structure and
b) Value of periodic coupon investments, which are re-invested on the then existing interest rates.

In case, there is a fall in the interest rate, bond prices will rise and the value of bond portfolio will rise but at the same time coupon payments will be reinvested at a lower yield. Likewise, when interest rate rise, bond prices will fall and value of bond portfolio will be lower than expected but will be compensated by the yield on the coupon investments.

We find that the cost of creating a perfect immunized portfolio is Rs. 385,543.30 as observed in the case of zero-coupon bond. Our new portfolio should not cost more than this amount and also hold valid for the period of 10 years with upcoming liability of Rs.1,000,000.

Let us build a portfolio as shown below (Illustration 19.2) where coupon is 7% p.a. received annually, face value of the bond portfolio is Rs.518,000 and it is also the redemption value. The portfolio has a duration of 10 years, a maturity of 20 years, and current market value of the bond portfolio is Rs.385,699 (the difference in price from the zero coupon bond's price is due to ease of calculation only).

Illustration 19.2: Three scenarios for a portfolio

	Scenario I	**Scenario II**	**Scenario III**
Coupon	7.00%	7.00%	7.00%
Face Value, Rs	5,18,000	5,18,000	5,18,000
Interest Rate	10.0%	5.0%	15.0%
Duration, in yrs	10.0	10.0	10.0
Current Price, Rs	3,85,699	3,85,699	3,85,699
At end of 10th Year	**Scenario I**	**Scenario II**	**Scenario III**
FV of Coupons, Rs	5,77,891	4,56,074	7,36,213
Price of Bond, Rs	4,22,513	5,97,997	3,10,022
Total Value, Rs	**10,00,404**	**10,54,072**	**10,46,235**

We have now three scenarios that could manifest after investing in this bond portfolio: interest rates remain unchanged, interest rates move down and interest rates move up which

are depicted as scenarios I, II and III respectively. You can see at the end of 10th year, that a fall in bond price is compensated by income on re-investment of coupon payments and vice-versa. By keeping the Macaulay Duration of the bond portfolio equal to the liability maturity time frame, the offset is nearly equal. Table No. 19.1 shows the detailed calculation of the future and present values of the coupons, and the value of the bond at the end of 10th year. The discounting and compounding rates are the respective rates that prevail in each of the three scenarios, i.e. 10%, 5%, and 15%, respectively.

Table 19.1: Detail Calculation

	Scenario I			Scenario II			Scenario III		
Years	Cash Flow	Present Value	FV of Coupons	Cash Flow	Present Value	FV of Coupons	Cash Flow	Present Value	FV of Coupons
1	36,260		85,499	36,260		56,251	36,260		1,27,558
2	36,260		77,727	36,260		53,573	36,260		1,10,920
3	36,260		70,660	36,260		51,021	36,260		96,452
4	36,260		64,237	36,260		48,592	36,260		83,872
5	36,260		58,397	36,260		46,278	36,260		72,932
6	36,260		53,088	36,260		44,074	36,260		63,419
7	36,260		48,262	36,260		41,975	36,260		55,147
8	36,260		43,875	36,260		39,977	36,260		47,954
9	36,260		39,886	36,260		38,073	36,260		41,699
10	36,260		36,260	36,260		36,260	36,260		36,260
11	36,260	32,964		36,260	34,533		36,260	31,530	
12	36,260	29,967		36,260	32,889		36,260	27,418	
13	36,260	27,243		36,260	31,323		36,260	23,842	
14	36,260	24,766		36,260	29,831		36,260	20,732	
15	36,260	22,515		36,260	28,411		36,260	18,028	
16	36,260	20,468		36,260	27,058		36,260	15,676	
17	36,260	18,607		36,260	25,769		36,260	13,631	
18	36,260	16,916		36,260	24,542		36,260	11,853	
19	36,260	15,378		36,260	23,374		36,260	10,307	
20	5,54,260	2,13,691		5,54,260	3,40,268		5,54,260	1,37,005	
		Bond Price	FV of Coupons		Bond Price	FV of Coupons		Bond Price	FV of Coupons
Value at t=10		4,22,513	5,77,891		5,97,997	4,56,074		3,10,022	7,36,213

Note: For illustration a 20-year bond is taken.

It can be easily seen from the above table that immunization is achieved by matching the portfolio duration with the liability maturity time-frame. In fact, if there is an interest movement, the final value is somewhat higher than scenario I. This is because we know that loss is overvalued and gain is undervalued by duration measurement.

For a Zero coupon bond, its Macaulay Duration is equal to its maturity since there no in-between cash flows are involved. This is the reason, zero-coupon bond with matching maturity is theoretically the best portfolio to immunize against interest rate risk.

Immunization is not a passive strategy like Buy and Hold strategy. It does involve some active management of funds with the change in interest rates. Every time interest rate changes, the portfolio needs immunization, which means duration is readjusted to match with the remaining maturity. Further, whenever re-immunization is done, it needs to match with the internal yield curve, which means trying to achieve the expected yield of the investing entity or the fund, and also the duration of the underlying.

19.3 Active Management Strategy

A portfolio manager takes a view on future possibilities in terms of either interest rate movement or yield spreads or credit quality and accordingly adjusts the portfolio whenever it is appropriate. Here, the portfolio manager does not accept the status quo as given and proactively takes steps to maximise returns based on her assessment of future direction.

A portfolio generally follows a benchmark, similar to the one which represents portfolio objective. To outperform the benchmark, the portfolio manager deliberately deviates from the benchmark. Construction of such a portfolio and its rebalancing during the journey is called Active Portfolio Management.

Any active management strategy also has to keep the following considerations:

- Objective of the fund;
- Regulatory and internal guidelines of managing the portfolio;
- Assumptions and its validity in future rate behavior; and
- Cost, in case of going wrong in assessment of future behavior of interest rates.

The fund manager, therefore, tries to achieve a balance of maximising alpha (from actively managed portfolio) along with outlook, costs, limitations and risk management.

Types of Interest Rate Strategies--Managing Duration of Portfolio

19.3.1 Interest Rate Driven Strategy

The most common of all active management strategies is managing duration of the portfolio based on the forecasts on interest rate fluctuations. This can be executed in any of the following manner:

Directional Call: Whenever a portfolio manager takes a call on future expected interest rate, which can be either hardening or softening of interest rates, she makes necessary changes by way of duration management to maximize portfolio return. This is a directional call. The manager would reduce the duration of the portfolio if she expects the interest rates to rise. This will help her to protect from price risk. Similarly, if the outlook of the manager is of declining interest rate, she would increase the duration of the portfolio as it would help her in maximising returns.

Barbell and Bullet Strategy: Sometimes, the uncertainty is so high that interest rate can move in either direction. In such a circumstance, the portfolio manager uses a barbell strategy. In the barbell strategy, portfolio is concentrated at both ends of duration with very minimal mid-duration bonds. For example, construct a portfolio with 40% in short-term bonds, 40% in long-term bonds and remaining 20% in mid-term bonds. The nomenclature long-mid- and short-terms are relative and vary depending on the objective and market structure. However, as

practice (and also endorsed by SEBI while categorising Fixed Income Mutual Funds) bonds with Macaulay Duration of more than 7 years are categorised as Long Duration, between 3 to 7 years as Mid Duration and less than 3 years as Short Duration.

When interest rate rises, the short-term bonds (after completing its maturity) are reinvested at higher yield whereas the long-term bonds are left untouched. Similarly, when interest rate declines, loss on short-term bonds reinvestment is compensated with the value increase in long-term bonds. This strategy is a natural hedge to protect overall return of the portfolio.

Similarly, buying zero coupon bonds with bullet payment in itself is an active strategy. However, it is important to note here that the sensitivity of zero-coupon bond is highest for the same maturity coupon paying bonds.

Floaters: Investing in floaters provides protection from large movement of interest rates. A floater bond's coupon is reset on periodic intervals as and when the underlying index is reset (for example the floater bond's coupon is linked to quarterly GDP growth rate or quarterly wholesale inflation index etc.) Therefore, the maximum duration of a floater bond at any given point in time is only the remaining time when the underlying index is reset, even though the maturity of the floater bond may be much longer.

Maturity Extension: When interest rates are stable and low, buying long-dated (i.e. long maturity) bonds provide higher yields, assuming a normal rising yield curve, as compared to the benchmark index, which is a combination of bonds of varying maturities. While, this appears intuitive, it comes with high price sensitivity to interest rate risk given long duration.

Roll Down: In a typical rising yield curve, as one progresses with time, remaining YTM declines. For example, you buy a 10-year bond for 8% yield and as time progresses, after 5-year, when the remaining maturity is just 5-year, yield is say 6%. Value of bond appreciates. So, the portfolio takes advantage of both the coupon payments (cash in hand) and price appreciation of the bond.

Buying Convexity: For larger movement in yields, the yield/price movement deviates from linear relationship. Convexity is a second order effect which captures bond price movements for large changes in yields. If a bond has positive convexity then the bond price increases more if interest rate declines than the duration estimate would suggest. Likewise, bond price decrease is less when interest rate rises than the price decrease estimated by duration.

This simply means that the expected return of a bond with positive convexity will be higher than the return of an identical duration, lower convexity bond when interest rate changes.

A portfolio's convexity can be changed by shifting the maturity/duration distribution of bonds in the portfolio, by adding/removing bonds with the desired convexity properties or by using derivatives

Convexity plays a big role in managing interest rate risk when yield curve movement is expected in terms of its level, slope or curvature.

Thus, interest rate driven strategies depend a lot on interest rate structure over various maturities i.e. the yield curve. This is decided by three S's of the yield curve:

- **Shift in the yield curve:** When the whole yield curve shifts parallelly up or down;
- **Slope of the yield curve:** How steep or flat the yield curve is; and
- **Shape of the yield curve:** Decided by curvature and measured through convexity.

Portfolio manager takes a view on these 3S i.e. Shift, Slope and Shape of yield curve to adjust her portfolio and result into active management.

19.3.2 Credit Analysis

Credit or default risk is inherent to corporate bonds. Credit rating agencies evaluate financial situation of such issuers and assign each issue of the issuer, separately, a suitable rating. In India, it is mandatory to obtain a credit rating before issuing any bond or commercial Paper.

Since corporate bonds have credit risk, they offer higher yield too. If 5-year Government Bond yields 8%, AAA corporate bond will offer more than 8% (say 9%), AA Corporate bond will offer even more than AAA bonds (say 10%). This difference is also known as credit yield spread. Sovereign funds, as discussed, are free from credit risk.

The value of the portfolio that invest in bonds with credit risk will be sensitive to the change in interest rate structure i.e. the 3S (*Shift, Slope and Shape*) and change in credit spread. Collectively the two will impact the value of the portfolio. Portfolio manager, therefore, has to continuously monitor the credit quality of portfolio constituents and also if they are priced correctly for the expected credit loss.

Put option embedded bonds: In many cases, bondholders want to exercise control on the outcome of bonds to protect their interest. A put option, therefore, gives an option to the bondholders to sell their bonds to the issuer and the issuer is obliged to buy it back. Bondholders are, therefore, willing to forego some part of yield to have this put option.

While investing in bonds with credit risk, the following things need to be considered:

- Objective of the fund in terms of maintaining credit quality of the portfolio;
- Regulatory and internal guidelines of managing the portfolio;

- Assumptions and its validity in future rate behavior; and
- Cost of going wrong in assessment of future behavior of interest rates and credit spread.

In practice, portfolio managers do not entirely depend on credit rating but do their own credit research to evaluate issuer's financial conditions and future prospects. Such analysis revolves around the four Cs: Capacity, Collateral, Covenants and Capital. This helps in arriving two main components (a) probability of default and (b) loss given default.

Types of Credit Funds Management

Optimizing yield and credit quality: This is the most common strategy involving *Investment Grade securities*, where a portfolio manager tries to maximise yield without impacting its quality. So, if the minimum acceptable investment grade papers are AA+, the portfolio manager would keep a balance between AAA and AA+. Even within the same credit rating, other factors play an important role in deciding spread e.g. Sector, Business Outlook, Possible up/down grade of the Company, Liquidity etc.

Apart from plain vanilla corporate bonds, there are other type of credit products such as Collaterised Loan Obligations, Collateralised Mortgage Loans, Asset Backed Securities etc., which are generally created by pooling small-ticket loans. Such pooled products are rated higher than the individual constituents and the yield tends to be superior than similar rated plain vanilla bonds.

High Yield/Junk Corporate Bonds: These securities have very low credit rating and have high default risk when compared with the investment grade bonds. These are often referred as speculative grade securities.

In such kind of investment, portfolio manager focuses on short-dated securities where future earnings visibility is high. They also analyse carefully if the company is likely to return to profitability and if not, what are their chances to recover their dues in case of liquidation.

Given its high risk, expected return i.e. yield is also high. So, when a typical fixed income portfolio manager would focus on interest rate and spread, a high yield fixed income investment manager would spent a lot higher time on analysing credit risk.

Challenges in Credit Risk Management

Sharp deterioration in credit quality: Many a times, weakening of financial health is very fast or sudden. Credit Rating, in such cases, do not accurately reflect company's ground reality. Loss incurred due to such incidences are very high on the portfolio and at times leads to capital erosion.

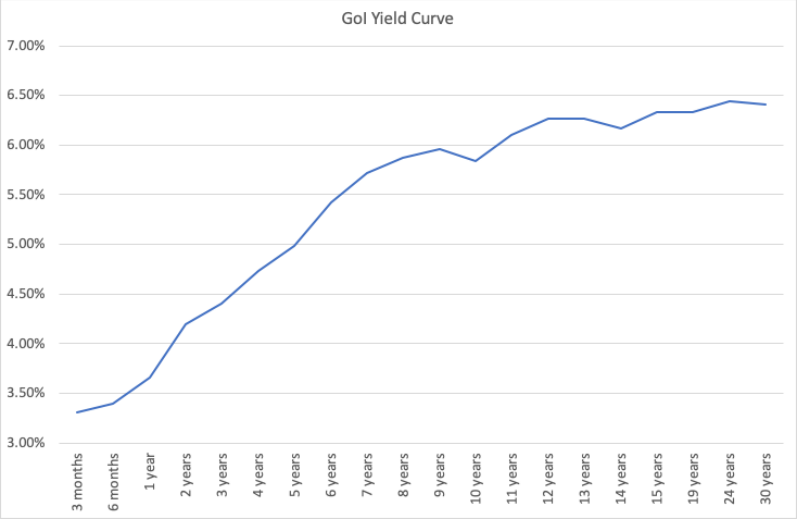
Poor portfolio diversification: Bond issuances are highly regulated and not all sectors are equally represented in fixed income market. In India, financial sector dominates the corporate bond market. This restricts benefits of diversification.

Higher Tail Risk: The difference between the theoretical loss as obtained using risk models versus the actual loss are sometimes large enough to impact capital significantly.

Active Management Strategy: Yield Spread Analysis

Exhibit 19.1 shows an upward sloping yield curve where yield for long-term is higher compared to the short-term yields.

Exhibit 19.1: GoI Yield Curve[95]



Note: GOI securities yield curve as on Aug 06, 2020

Difference between interest rate of two different time periods is referred as Term Spread. For example, the term spread between a 10-year G-Sec yielding 6.0% and 2-year G-Sec yielding 4.3% is 1.7%. The generally accepted explanation of changes in the yield spread is related to the economic environment. The yield spread widens during periods of economic uncertainty and recession because investors require larger risk premiums (i.e. larger spreads). In contrast, the spread will decline during periods of economic confidence and expansion. The portfolio manager forecasts the yield spread and according builds the portfolio.

19.4 Global Fixed Income Strategy

Today, fixed income investment is not constrained by national boundaries. In order to maximise return and income, investors scan available global opportunities. It opens door to new avenues. Opportunities are available due to both liquidity and illiquidity, arbitrage, information asymmetry, pricing of credit risk, niche products etc.

[95] Source: http://www.worldgovernmentbonds.com/country/india/

Some of the instrument or securities available are: Investment grade, High yield bonds, convertible bonds, securitized assets, sovereign debts etc.

The most important aspect of Global Fixed Income investments is to assess country risk by assessing monetary policy and other macro-economic factors besides legal & currency risk involved in such investments. Risk management, therefore, is one big activity for the portfolio manager.

Following are examples of some of the opportunities which the portfolio manager can exploit:

Relative Value: When an opportunity arises due to regional differences in credit cycles, credit quality, sector composition, market factors or credit pricing, portfolio manager would like to take advantage.

Illiquidity Premium: Emerging markets, in general, are less liquid compared to the developed markets. Portfolio managers command premium in holding such issues and generate extra return on such investments.

19.4.1 Risks in Global Investment

When global opportunities look lucrative as compared to domestic investments, portfolio managers must understand the risks associated with such portfolio. Some of the risks are:

Economy Risk: Each country has its own set of political, economic and corporate culture. Government rules and economic policies are designed to favour domestic economy and its citizens e.g. foreign portfolio investment rules, tariff & non-tariff restrictions. Any adverse regulations pose a serious threat to such investments.

Legal Risk: Sometimes legal risk, either due to lack of understanding or prolonged judicial recovery processes, can also wipe out or seriously dent portfolio returns.

Currency Risk: Investment in non-domestic currency always carries currency conversion risk. Returns can be wiped out due to adverse exchange rates. A portfolio manager, therefore uses currency swaps to hedge such exposures.

19.5 Constructing Bond Portfolio with Derivative Securities

The role of a portfolio manager, besides maximising return, is to manage risk of the portfolio. Risks could be interest rate risk, reinvestment risk, credit default risk, currency risk, liquidity risk etc.

Derivatives, when used as a hedging tool, provide formidable opportunities to minimize cost and losses and maximise gains. Some of the Derivatives used are: *Options, Futures, Forward Contracts, Interest Rate Swaps, Currency Swaps and Credit Default Swaps*.

Interest Rate Swap

It is an agreement between two parties to exchange their payment(s) equivalent to the interest payable on some notional principal amount. Payment(s) of one party is based on Fixed Interest Rate and that of other is on Floating interest rate, say 3-month Mibor rate. Payment can be either one-time or series of payment till the end of the agreement.

Similar to interest rate swaps, Interest Rate Options (also known as, Swaptions) is another major form of derivatives used in the portfolio. In Swaptions, holder of a payer swaption has the right, but not the obligation to enter into an interest rate swap. The option can be for both Fixed or Floating rate payments by the holder of Swaption. Seller of Swaption, on the other hand, has the obligation and for which she charges an option premium.

Futures

A Futures contract is an agreement to buy or sell a bond in the future at a price, which is agreed today. Futures contracts are standardized instruments traded on futures exchanges. The price of the futures contract is based on the anticipated future price of the underlying bonds discounted at the risk-free rate and supply and demand.

Forward Contracts

A Forward Contract is similar to bond futures, except that the contracts are not standardized and are based on over-the-counter (OTC) agreed terms and conditions. Forward Contracts are not traded on an exchange.

Credit Default Swaps

Credit default swap protects the buyer against a 'credit event' on an underlying bond. Examples of credit events include default on payment, rating downgrade, bankruptcies etc., which could negatively impact the portfolio. The protection buyer, therefore pays premium to the seller. It is like an insurance on the bond against credit event.

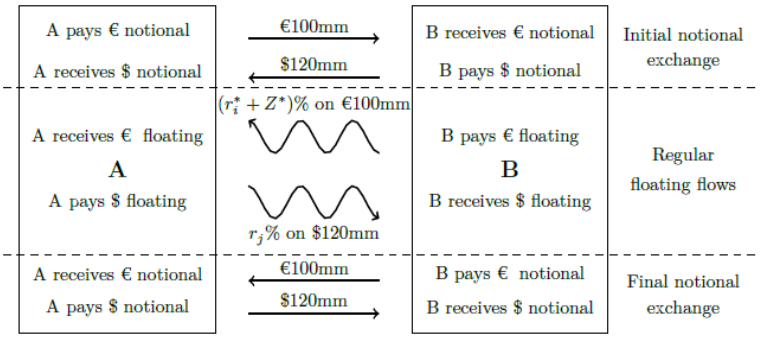
Currency Swap

When a portfolio manager invests in international market where the investments are in non-domestic currency, they need to protect their portfolio. An important way to protect against adverse currency movement is by using currency swaps (Exhibit 19.2).

The Cross Currency Swap is an over-the-counter (OTC) agreement to exchange a series of floating rate payments in one currency against a series of floating rate payments in another

currency. Also, generally such transaction has both initial and final exchange of notional principal too.

Exhibit 19.2: Currency Swap[96]



19.6 Protecting Portfolios with Derivatives

While derivatives are used to diversify and add incremental returns i.e. to maximise returns, the large use of derivatives is to protect portfolio from adverse circumstances. We know that a fixed income portfolio has risks such as interest rate risk, credit default risk, liquidity risk, reinvestment risk, market risk, currency risk etc. In any portfolio, one or two often weighs too much and needs protection against them more than other risks.

Portfolio manager, thus judiciously decides which risks to hedge and what risks they can live with, particularly when their performance is judged on relative basis.

Managing Interest Rate Risks

We observed in the last section that Interest Rate Swaps, Futures, Options, Swaptions, Forward Contracts etc. are tools used for portfolio creation. However, they are also tools to protect risks of the portfolio.

In all cases, the uncertain future or portfolio manager's expectation of adverse future interest rate movements is hedged using these tools. The details are already discussed, hence not repeated here.

Protective Put

An Option, when you are long on the underlying asset and a long position on put option, provides you protective put against adverse movement of price. It is generally divided into short periods (which gets rolled over at the end of each short-period) and at the end of each such period, protection against downside risk is provided by the option seller. Normally, a

[96] Source: https://en.wikipedia.org/wiki/Currency_swap

seller would include Cap and/or Floor to such transactions to protect itself against large price/interest rate swings.

Protective Put helps in two particular ways:

- Compared to the naked position, mean return increases with protective put.
- Left tail of return distribution is cut off completely, again pushing up the mean return.

Managing Asset & Liabilities

Assume an insurance or pension fund, where the liabilities are often in the range of 20-40 years. The assets i.e. in this case bonds, to fund these liabilities suffer from (a) non-availability of such long-term bonds and (b) such long duration assets imply large volatilities in price movements during the course of journey. Such duration mismatch exposes the portfolio to uncompensated risk. So, how would you manage such liabilities?

The simplest way could be to achieve immunization by way of minimizing the *duration gap* with various options and futures besides swaps.

Chapter 19: Sample Questions

1. Which of these is NOT a significant risk while investing in Government of India Securities?
    a. Price Risk.
    b. Reinvestment Risk.
    c. Liquidity Risk.
    d. Credit Risk.

2. Which of these is/are CORRECT when a fixed income instrument has positive convexity?
    i. Price rise is more than the duration estimate when interest rate declines
    ii. Price rise is less than the duration estimate when interest rate declines
    iii. Price fall is more than the duration estimate when interest rate rises
    iv. Price fall is less than the duration estimate when interest rate rises

    a. I and III only
    b. II and IV only
    c. II and III only
    d. I and IV only

3. When you are managing a passive fixed income portfolio, which pairs are NOT correctly matched:

Sl. No	Objective	Benchmark Index Selection
i.	Risk-free long-term investment	Money Market Index
Ii.	Short-term cash management	Liquid Index
iii.	Income objective	Long Duration + Aggregate Index
iv.	Very Low Risk Appetite	Long Duration + High Credit Quality Index
v.	Inflation Risk Mitigation	10-yr G-Sec Benchmark

    a. I only
    b. II, III and IV only
    c. I and II only
    d. I, IV and V only

4. Assume you are a manager for the actively managed fixed income portfolio. Your analysis suggests that interest rate is likely to change significantly, but you are not sure whether it would go up or down. You want to protect your portfolio from such large swings as your current portfolio is of long-duration bonds. Which of the following you will evaluate as your options?
    i. Barbell Portfolio with 40% in long-duration, 40% in short-duration and 20% in mid-duration bonds.
    ii. Shift 60% or more of your portfolio into floating rate bonds.
    iii. Buy put options with notional value equal to your portfolio value.
    iv. Buy Swaptions of notional value equivalent to the portfolio value.

    a. I only
    b. I and II only
    c. I and III only
    d. I, III and IV only.

5. Which among the following makes it difficult to exactly replicate a Fixed Income Index as compared to the Equity Index?
    i. Availability of constituents
    ii. Liquidity of constituents
    iii. Matching Duration
    iv. Matching Credit Quality

    a. I and II only
    b. II, III and IV only
    c. II and IV only
    d. All Four I, II, III and IV

Sample Caselet

1. An Educational Institution approaches a PMS provider for managing its Fund of Rs. 50 lakhs. The investment horizon is 10 years. The portfolio manager setsup a portfolio of two bonds with a duration of 10 years on 1st January. On 1st January, Bond A was selling at Rs. 750 with a Face Value of Rs.1000, paying 8% coupon once per year and maturing in 25 years. Bond B was selling at Rs. 690 with a Face Value of Rs.1000, paying 5% coupon once a year and maturing in 30 years. If the future 30 years would have a flat yield curve, how many A and B Bonds would have been purchased by the bond manager?

    b) 6287 and 413
    c) 6000 and 500
    d) 6100 and 495
    e) 7200 and 650

    Answer: a) 6287 and 413

    Explanation: Initially arrive at the yields to maturity given the market prices. Then arrive at the Duration of each bond.

    To calculate the weightages of investment in each bond:

    If x is the weight of the Bond A then (1-x) is the weight of Bond B. The weighted average duration of the portfolio should be 10. So after calculating duration of bond A and Bond B, form the following equation:

    [duration of Bond A multiplied by (x)] + [duration of Bond B multiplied by (1-x)]=10. With this x can be solved. Thereafter, the amount of Rs.50,00,000 will be invested in each bond as per the weightage. After that the number of bonds can be calculated (Amount invested / Price of Bond).

CHAPTER 20: PERFORMANCE MEASUREMENT AND EVALUATION OF PORTFOLIO MANAGERS

LEARNING OBJECTIVES:

After studying this chapter, you should know about:

- Understand different ways of calculating the return
- Understand different ways of calculating the risk
- Understand different ways of calculating the risk-adjusted return
- The importance of Benchmarking and peer group analysis
- Performance reporting to the Investor by PMS
- Global Investment Performance Standards

20.1 Parameters to define performance – risk and return

The main issue in performance measurement and evaluation is the human tendency to focus on the return, the investment has earned over a period of time with little regard to the risk involved in achieving that return. Proper performance measurement should involve recognition of both return and risk of investments.

20.2 Rate of return measures

The most vital statistic in measuring the performance of a portfolio is the rate of return. Rate of return has many possible definitions. However, there is one possible definition for each purpose. So, one should make effort to obtain clarity about the purpose for which the performance is to be measured and then look at an appropriate return measure.

20.2.1 Holding period return:

The most straightforward rate of return is the holding-period-return (HPR), popularly known as total return or point-to-point return. It equals the income generated by an investment plus the change in value of the investment during the period the investment is held, over the beginning value of the investment, expressed as a percentage per annum.

For example, If the market value of an investor's portfolio on 1 April, 2018, is Rs.1,00,000, and on 31 March, 2019 the market value of the same portfolio stands at Rs.1,20,000, the investor would have achieved a holding-period return equal to 20%. In general, we can use Equation (1) to compute holding-period returns.

HPR = (E-B)/B ……. Equation 1
HPR = ((120000-100000))/100000 = 20%

Further, assume that during the same period the investor has received Rs. 5000 by way of dividend and interest income, then:

HPR = (I + (E -B)) / B ……. Equation 2
HPR = (5000 + (120000-100000))/100000 = 25%
Where:

HPR = holding-period return
I = Income
E = Ending Value
B = Beginning Value.

This measure assumes that all income distributions are made at the end of the year. Inspite of this limitation, Holding Period Return measure is widely used and generally accepted indicator of performance. This is considered as the starting point of performance measurement exercise.

20.2.2 Time weighted Rate of Return (TWRR) versus Money weighted Rate of return (MWRR)

Let us now consider rate of return over multiple holding periods. Suppose a portfolio has generated the following annual holding period return from 2015 through 2019 (Table 20.1):

Table 20.1: Five year Holding Period returns

Year	HPR for the year
2015	-5.00%
2016	-15.20%
2017	8.10%
2018	30.75%
2019	17.65%

Suppose further that the investor has invested Rs. 75,000 in this portfolio by making contributions at the beginning of each year as follows (Table 10.2):

Table 20.2: Investment Contributions

Year	Investment Amount in Rs.
2015	5000
2016	10000
2017	15000
2018	20000
2019	25000

At the end of 2019, the investments would have grown to the value of Rs. 105,920.31 as shown below:

Table 20.3: Computation of Returns and portfolio value at the beginning and end of the period

A	B	C	D	E	F
	Investment made at the beginning of the year in Rs.	Return generated during the period	Return made during the period in Rs.	Portfolio Value at the beginning of the period in Rs.	Portfolio Value at the end of the period in Rs.
2015	5000	-5.00%	-250	5000	4750
2016	10000	-15.20%	-2242	14750	12508
2017	15000	8.10%	2228.15	27508	29736.15
2018	20000	30.75%	15293.87	49736.15	65030.01
2019	25000	17.65%	15890.3	90030.01	**105920.31**

What is the rate of return generated during the period of five years?

By discounting the terminal value of the investment i.e. Rs. 105,920.31 and the cashflow contributions made, internal rate of the return for the same can be calculated.

$$5000 = -\frac{10{,}000}{(1+r)^1} - \frac{15{,}000}{(1+r)^2} - \frac{20{,}000}{(1+r)^3} - \frac{25{,}000}{(1+r)^4} + \frac{105{,}920.31}{(1+r)^5}$$

(Internal Rate of Return) IRR = 15.15%.

IRR is also referred as MWRR (Money Weighted rate of return). Financial calculators and spreadsheet have inbuilt function for solving the IRR.

MWRR is the annual rate of return at which the cumulative contributions grow over the measurement period. MWRR depends on the timing of the cash flow. If we reverse the order of contributions of the same amount i.e. Rs. 75,000, as shown below, MWRR would change to 10.21%, as shown in Table 20.4

Table 20.4: Impact of change in the timing of cashflows

A	B	C	D	E	F
	Investment made at the beginning of the year in Rs.	Return generated during the period	Return made during the period in Rs.	Portfolio Value at the beginning of the period in Rs.	Portfolio Value at the end of the period in Rs.
2015	25000	-5.00%	-1250	25000	23750
2016	20000	-15.20%	-6650	43750	37100
2017	15000	8.10%	4220.1	52100	56320.1
2018	10000	30.75%	20393.43	66320.1	86713.53
2019	5000	17.65%	16187.44	91713.53	**107900.97**

$$25000 = -\frac{20{,}000}{(1+r)^1} - \frac{15{,}000}{(1+r)^2} - \frac{10{,}000}{(1+r)^3} - \frac{5{,}000}{(1+r)^4} + \frac{107{,}900.97}{(1+r)^5}$$

MWRR or IRR = 10.21%

Alternatively, in order to calculate the underlying investment performance without being influenced by the timing of cash flow, TWRR can be calculated.

The Global Investment Performance Standards (GIPS) glossary defines time-weighted rate of return as a "calculation that computes period by period returns on an investment, and removes the effects of external cash flows, which are generally client driven, and best reflects the portfolio manager's ability to manage assets according to a specified strategy or objective."

TWRR is the compound rate of growth over the stated period. In TWRR, portfolio will be valued every time there is an external cash flow. When there is an external cash flow, TWRR requires computing a set of return for each period. These sub-period returns will be linked together to compute TWRR for the evaluation period.

The following table 20.5 gives the contribution made by the investor along with the portfolio value for five years period.

Table 20.5: Illustration on Time Weighted Rate of Return

A	B	C
	Investment made at the beginning of the year in Rs.	Portfolio Value at the end of the period in Rs.
2015	5000	4750
2016	10000	12508
2017	15000	29736.15
2018	20000	65030.01
2019	25000	105920.31

In this example, there are five sub periods. First step towards calculating the TWRR is to calculate each period return as shown below in Table 20.6 using equation 1 i.e. (E-B)/B.

Table 20.6 Calculation of Sub-Period Returns

A	B	C	D	E
	Investment made at the beginning of the year in Rs.	Portfolio Value at the end of the period in Rs.	Portfolio Value at the beginning of the year in Rs.	Return made during the year
2015	5000	4750.00	5000.00	-5.00%
2016	10000	12508.00	14750.00	-15.20%
2017	15000	29736.15	27508.00	8.10%
2018	20000	65030.01	49736.15	30.75%
2019	25000	105920.31	90030.01	17.65%

The next step is to link these five sub-period return together. For chain linking these sub-period return, we have to calculate wealth relatives. Wealth relative is ending value of one unit of money. Hence, what needs to be done to create wealth relative is to add the number 1 to each periods return in its decimal form, as shown below Table 20.7

Table 20.7 Calculation of Wealth Relative

	Return made during the year	Wealth Relative
2015	-0.05	0.9500
2016	-0.152	0.8480
2017	0.081	1.0810
2018	0.3075	1.3075
2019	0.1765	1.1765

The next step is to create a cumulative wealth relative for the entire evaluation period by multiplying each period wealth relative as shown below.

Cumulative wealth relative = 0.95 x 0.848 x 1.081 x 1.3075 x 1.1765 = 1.3396

Cumulative wealth relative tells us what one rupee has grown over a period of time, in this case five-year period. In this example one rupee has become Rs.1.3396 in a period of five years. The compound annual return can be calculated as:

TWRR=(Cumulative wealth relative^(1/n))-1
TWRR = (1.3396 ^ (1/5)) - 1 = 6.021%

The TWRR is the same as geometric return.
Note that unless the sub-periods constitute exactly one year, time-weighted rate of return will not be expressed as an annual rate, and we have to annualize the return.

SEBI (Portfolio Managers) Regulation, 2020 prescribes discretionary portfolio managers to disclose performance using 'Time Weighted Rate of Return' for the immediately preceding three years. For illustration see Box 20.1

In order to make the investors fully aware about how their funds have been deployed and also to given them an objective analysis of the portfolios being managed by the portfolio manager on discretionary basis in comparison with the rise or fall in the markets, portfolio managers shall disclose the performance of benchmark indices in the periodical reports to be furnished to the client in terms of the PM Regulations.

The portfolio managers may select any of the indices available, e.g. BSE (Sensitive) index, CNX Nifty, BSE 100, BSE 200 or CNX 500, depending on the investment objective and portfolio of the client. These benchmark indices may be decided by the portfolio managers and any change at a later date shall be recorded and justified with specific reasons thereof.

As the purpose of introducing benchmarks is to indicate the performance of the portfolios vis-à-vis markets to the investors, the portfolio managers may give performance of more than one index if they so desire. Also, they have the option to give their management perception on the performance of their schemes.

The Boards of portfolio managers may review the performance of the funds managed by them for each client separately in their meetings and should take corrective action wherever necessary. They may also compare the performance of the portfolios with benchmarks.

In relation to performance of the portfolio manager, it is also clarified that the Portfolio Managers shall:

1. Consider all cash holdings and investments in liquid funds, for calculation of performance.
2. Report performance data net of all fees and all expenses (including taxes)
3. Clearly disclose any change in investment approach that may impact the performance of client portfolio, in the marketing material.
4. Ensure that performance reported in all marketing material and website of the Portfolio Manager is the same as that reported to SEBI.
5. Ensure that the aggregate performance of the Portfolio Manager (firm-level performance) reported in any document shall be same as the combined performance of all the portfolios managed by the Portfolio Manager.
6. Provide a disclaimer in all marketing material that the performance related information provided therein is not verified by SEBI.

Box 20.1: Calculation of Time-Weighted Rate of Return

Steps to Compute Individual Portfolio TWRR:

1. Begin with market value at the beginning of the period.
2. Move forward through time towards the end of the period.
3. Compute the market value of the portfolio immediately before the contribution to / withdrawal from the portfolio.
4. Calculate a sub-period return for the period between the valuation dates i.e. the dates corresponding to the contribution and / or withdrawal dates using the formula:
   (Ending Market Value - Beginning Market Value - Contribution + Withdrawal) ÷ (Beginning Market Value + Contribution - Withdrawal)
5. Repeat steps 3 and 4 for each contribution and / or withdrawals
6. When there are no more contributions and / or withdrawals, calculate a sub-period return for the last period to the end of the period market value.
7. Compound the sub-period returns by taking the product of (1+sub-period returns). This is called geometric linking or chain linking of the sub-period returns.
8. Subtract 1 from the product value as arrived at in step 7 above.
9. Express the result as per 8 above in percentage terms to get the TWRR for the time period under evaluation.

Example:

An account is funded on 1-Jan-2019 by an amount 50,00,000. On 1-Mar-2019, client contributed additional 20,00,000. The market value of the account as on 28-Feb-2019 is 49,00,000. On 1-Oct-2019, the client withdrew an amount of 10,00,000 from the account. The market value of the account on 30-Sep-2019 was 75,00,000. The market value of the account on 31-Dec-2019 was 70,00,000.

Sub-Periods	**Sub-period returns**	**Sub-period returns + 1**
1-Jan-2019 to 28-Feb-2019	(49,00,000 – 50,00,000) ÷ 50,00,000 = -2.00%	(1 – 2.00%) = 0.98
1-Mar-2019 to 30-Sep-2019	(75,00,000 – 49,00,000 – 20,00,000) ÷ (49,00,000 + 20,00,000) = 8.69%	(1 + 8.69%) = 1.08
1-Oct-2019 to 31-Dec-2019	(70,00,000 - 75,00,000 + 10,00,000) ÷ (75,00,000 - 10,00,000) = 7.69%	(1 + 7.69%) = 1.07
TWRR		**((0.98*1.08*1.07) – 1)*100 = 14.71%**

Source: SEBI FAQs dated October 2020

20.2.3 Arithmetic Mean Return (AMR) vs. Geometric Mean Return (GMR)

Suppose there are two portfolio choices available to invest Rs.100,000. First choice produces a holding-period rate of return of -50 percent in the first year and 100 percent in the second year. Another choice produces holding-period rate of return of 10 percent in the first year and 10 percent in the second year. Which one would you suggest?

In case of the first scheme at the end of the second year, the investor will end up with Rs.100,000. The value of the portfolio is the same, as it was two years ago, though the average annual return on the portfolio is 25 percent.

With the second choice the value of the portfolio at the end of the second year is Rs.121,000; an average annual 10 percent gain in value. Clearly, investor is better off with the second scheme, although it produces average annual return lower than the first scheme.

To understand how the outcome in the two cases are so different, it is important to distinguish the two methods of calculating returns. The average annual **arithmetic return** is the simple average of individual total yearly returns.

The yearly return is the sum of:

(1) the percentage gain (or loss) in the value of your portfolio due to changes in asset prices and
(2) any dividends or other cash distributions, expressed as the percent of invested assets.

The arithmetic mean is the “simple average” of a series of returns, calculated by summing all of the returns in the series and dividing by the number of values.

$$AMR = \sum_{t=1}^{n} R_t/n$$

For the first choice the AMR = (-50%+100%)/2 = 25%

For the second choice the AMR = (10%+10%)/2 = 10%

The best estimate of a future year's return based on a random distribution of the prior years' returns is the arithmetic average. Statistically, it is our best guess for the holding-period return in a given year. If we wish to estimate the expected return over a multiyear horizon conditioned on past experience, we may use the arithmetic average.

The second method of calculating returns is the average annual **geometric or compound return.** The average geometric return is far more important than the average arithmetic

return if one is analyzing the long-run return on assets. The average annual geometric return is the rate at which the sum you invested at the beginning of the period will accumulate to a given sum at the end of the period by the process of compounding, or continuously reinvesting your dividends and capital gains. A characteristic of the compound return is that it depends only on the initial and final values of the portfolio, not on the path by which that value was realized.

GMR is based on an exponential function, which represents periodic compounding.

$$GMR = \prod_{t=1}^{n}(1 + R_t)^{1/n} - 1$$

As can be seen in the formula, the process of calculating the GMR is the same as TWRR. We are required to calculate wealth relatives for each HPR. Then we have to link these sub-period returns.

In the above example, the evaluation period is two years. Hence to calculate annualized return, the cumulative wealth ratio is raised to (1/2). n being the number of years.

For the first choice GMR = (((1+-50%)*(1+100%))^(1/2)) -1 = 0

For the second choice GMR = (((1+10%)*(1+10%))^(1/2)) -1 = 10%

For a one-year holding period the arithmetic and geometric returns are identical, since both calculate the total return over one year. But over longer holding periods the geometric average return is always less than the arithmetic return except when all the individual yearly returns are exactly the same, in which case the geometric return equals the arithmetic return.

Given the initial and final value of a portfolio, a fund manager can always increase the average annual return by increasing risk. As noted above, a manager who takes your portfolio from Rs. 100 to Rs.50 and back to Rs. 100 again, achieves an average arithmetic return of 25 percent. Yet every investor should prefer the second manager to the first. Geometric return is the only way to compare long-term accumulations. It explains what has really happened to the investments. If, however, we wish to estimate the probability distribution of terminal wealth we should use the geometric average.

20.2.4 Gross versus net return

The gross return is the total return generated on investment before the deduction of any fees, expenses or commissions. Gross return is stated for a specified period of time. Net return is calculated after adjusting gross return for fees, expenses or commissions. Net return is the return investor actually makes, hence focusing on gross return can be misleading though it can be used to evaluate the performance of investments at a broader level.

Let us look at the following example of a portfolio to understand the difference between gross return and net return. Given below is the information about the size of the portfolio, investment period, fees, expenses etc.

1. Size of sample portfolio: Rs. 100 lacs
2. Investment Period: 1 year
3. Profit made during the year: 20% on the capital contribution
4. Hurdle Rate: 10% of amount invested
5. Other Expenses such as Brokerages, DP charges etc., charged on gross value of portfolio (0.50%)
6. Upfront fee – Nil
7. Setup fee-Nil
8. Fixed Management fee charged on average of capital contribution and gross value of portfolio (e.g. 1.5%)
9. Performance fee (e.g. 20% of profits over hurdle rate without catch-up)
10. The frequency of calculating all fees is annual.

What is the gross return and net return on investment?

Capital Contribution made at the beginning of investment period (i)	1,00,00,000
Less: Upfront fees	-
Assets under management (AUM)	1,00,00,000
Add/ Less: Profits/ Loss on investment during the year on AUM at 20%	20,00,000
Gross Value of the Portfolio at the end of the investment period	1,20,00,000
Less: Other Expenses (0.50% of the gross value of the portfolio at the end of the investment period) (a)	60,000
Gross Value of the Portfolio less Other Expenses	1,19,40,000
Less: Fixed Management Fees (1.50%) of ((100,00,000+120,00,000)/2) (b)	1,65,000
Portfolio Value after charging Fixed Management Fees	1,17,75,000
Required Portfolio Value @ Hurdle Rate (i) * (1.10)^1 ie.100,00,000 * (1+10%)^1	1,10,00,000
Less: Performance Fee @ 20% of the Profits over Hurdle Level (c) 20%*(117,75,000-110,00,000)	1,55,000
Portfolio Value after charging Performance Management Fees i.e.(117,75,000-155,000)	1,16,20,000
Less: Exit Load (2%) (d)	2,32,400

Portfolio Value after charging Exit Load	1,13,87,600
Total Charges (a+b+c+d)	6,12,400
Net Value of the Portfolio	1,13,87,600

Gross return is the total rate of return earned. For the above example it is calculated as follows:

Gross Return = (Gross value of the portfolio – Capital Contribution)/Capital Contribution

Gross Return = (Rs. 1,20,00,000 Lacs. - Rs. 1,00,00,000 Lacs.) / Rs. 1,00,00,000 Lacs.
Gross Return = 20 %

Net Return is the return earned after adjusted for the fees and expenses. It is calculated as follows:
Net Return = (Net value of the portfolio – Capital Contribution)/Capital Contribution
Net Return = (Rs. 1,13,87,600 – Rs. 1,00,00,000) / Rs.1,00,00,000
Net Return = 13.88%

20.2.5. Pre-tax versus post tax return

The pre-tax rate returns are returns before taxes, and post-tax returns are returns after taxes are paid on investment income and realized capital gains. Investors belong to different tax brackets. Hence the performance of the investments is communicated as pre-tax rate of return. Investors or their financial advisors are expected to calculate the post-tax return by adjusting the pre-tax return to the tax rates applicable to the investors.

Pre-tax return = Post Tax Return/ (1-tax rate)

Post-tax return = Pre-Tax Return x (1-tax rate)

Pre-Tax return enables comparisons across different investments and strategies, since different investors may be subject to different levels of taxation. However, what really matters to the investor is post-tax return. Hence, they make investment decision on the basis of post-tax performance.

An example of post-tax return calculation is given below:

An individual achieves a 5% pre-tax rate of return for stock XYZ and is subject to a capital gains tax of 15%. The post-tax rate of return is:

Post-tax return = Pre-tax return x (1-tax rate)
Post-tax return = 5% x (1-15%) = 4.25%

20.2.6. Compounded Annual Growth Rate (CAGR)

Compounded Annual Growth Rate is a measure of an investment's annual growth rate over time, with compounding. It assumes that any dividend/income/rent declared by the investment is re-invested in the same investment on that day's market price.

Here is the compound interest formula to determine the CAGR between the opening and closing wealth.

The formula is:
$(A / P)^{(1 / t)} - 1$,

Where
'A' is the closing wealth,
'P' is the opening wealth and
't' is the time period in years

Suppose an investor has invested Rs. 100,000 in an investment for five years. The year on year return is given as follows:

Year	Return
2015	-5.00%
2016	-15.20%
2017	8.10%
2018	30.75%
2019	17.65%

For calculating the CAGR, we need to calculate the terminal wealth i.e. the end of the period value of the investment.

Year	Return	Investment value at the end of the year in Rs.
2015	-5.00%	95,000
2016	-15.20%	80,560
2017	8.10%	87,085
2018	30.75%	1,13,864
2019	17.65%	1,33,961

As can be seen, Rs. 100,000 has grown to Rs. 1,33,961 in five years. Using the formula for compound interest, CAGR can be calculated as:
CAGR = (1,33,961/1,00,000) ^ (1/5)-1= 6.02%

As demonstrated below, CAGR is the constant rate of growth to reach the same terminal value.

Year	Return	Investment value at the end of the year in Rs.	Investment value at the end of the year growing at the rate 6.0622% in Rs.
2015	-5.00%	95,000	1,06,020
2016	-15.20%	80,560	1,12,410
2017	8.10%	87,090	1,19,180
2018	30.75%	1,13,860	1,26,350
2019	17.65%	1,33,960	1,33,960

20.2.7. Annualizing return

For facilitating comparison, rate of return is reported on annualized basis. The annualized return represents the compound average annual return of the investment. The calculation is same as the calculation of CAGR or geometric men return. Return are annualized by following the same chain linking method and the product of the linking is raised to the reciprocal of the number of years in the evaluation period.

For example, a portfolio has generated the following return in the last three years.

Year	Return
2017	15.5%
2018	9.50%
2019	-6.90%

First step in annualizing the return is to calculate the wealth relative:

Year	Return	Wealth Relative
2017	15.5%	1.1550
2018	9.50%	1.0950
2019	-6.90%	.9310

Next step is to take the product of the wealth relative:

1.1550 x 1.0950 x .9310 = 1.1775

Next is to raise it to the reciprocal of the number of years:

1.1775^ (1/3) = 1.0559

Final step is to subtract 1:

1.0559 -1 = 0.0559 or 5.56 %

If the measurement year is less than a year, it is inadvisable to calculate annualized return, as it means extrapolating the return to a full year. Particularly for those investments where returns can fluctuate significantly during the remaining period.

20.2.8. Cash Drag adjusted return

Portfolio managers may not invest the entire capital contribution made by investors for variety of reasons. However, while computing return, for the investment period, the capital contribution made by investors need to be taken into consideration. It has been observed that portfolio managers were not taking into account the cash component in computing returns (i.e. ignoring the drag that cash exerts on returns). This practice mis-states the return as shown in the example below.

An investor has invested Rs. 100 lacs in an equity investment portfolio. The manager has invested only Rs. 75 Lacs in the equities and Rs. 25 lacs are lying in the liquid funds. For the period, the equity exposure has generated a return of Rs. 7.5 Lacs, while the liquid fund has given 4% return.

Return on investment (ignoring the drag cash has exerted) = Rs. 7.5 lacs / Rs. 75 lacs = 10%

Return on investment (adjusting the drag cash has exerted) in Rs. = (10% x Rs.75 lacs) + (4% x 25 lacs) = Rs. 85,000 or 8.5% on Rs. 100 lacs

20.2.9. Alpha and Beta return

Most investment portfolios tangle alpha and beta decisions together. The returns from such portfolios can be decomposed into alpha and beta return by using asset pricing models. The most popular asset pricing model is Capital Asset Pricing Model (CAPM).

The CAPM theorizes that risk consists of a systematic component (that is non-diversifiable) and a unsystematic (idiosyncratic or unique) component that is diversifiable. Risk that is unsystematic can be diversified away hence an investor should not expect compensation for bearing this type of risk. As per this model, investments are to be priced for their market risk i.e. non-diversifiable risk. Market risk as discussed in 10.3.3 is measured by Beta. Under CAPM, the required return on a security or portfolio is computed as:

Required return = Rf + B (Rm – Rf)

Rf = Risk free return
B = Market Beta of the security/portfolio
Rm = Return on a Market Portfolio (A popular broad market index is a good proxy)
Alpha is the return generated by the portfolio over the over the required rate of return as per CAPM. This is expressed as follows:

Portfolio Return - Rf + B (Rm – Rf) = Alpha Return

For understanding decomposition of return, look at the following example.

Example:
A portfolio has generated a return of 25%. The market benchmark return for the same period is 15%. The beta of the portfolio is 1.5. Treasury bond yield is 5%.

The return of the portfolio has three components:
Risk free return = 5%
Beta return = Beta * (Rm-Rf)
Beta return = 1.5 x(15%-5%) = 15%
Alpha return = Actual Return – Required rate of return
Alpha return = 25% - {5% + 1.5 x (15%-5%)}
Alpha Return = 5%
This is also referred as Jensen alpha.

Alpha return is a reward for bearing non-market risk. Beta return is a reward for bearing market risk.

Some professionals make a distinction between alpha and Jensen alpha. They refer to the excess return over the market benchmark return as alpha.

In the above example, excess return is 25% - 15% = 10%

20.2.10 Portfolio Return

The return of the portfolio is the weighted average return of individual securities in it. The following example, gives the weight (proportion) of four securities in the portfolio and their return.

Security	Return	Weight in the portfolio
A	15%	30%
B	10%	20%
C	12%	20%
D	18%	30%

The weighted average return of the securities is the return of the portfolio, calculated as follows:
Portfolio Return = (15%*30%)+(10%*20%)+(12%*20%)+(18%*30%) = 14.30%

20.3. Risk measures

Risk is the key dimension of performance measurement, and a decisive factor in selecting a portfolio manager.

20.3.1. Total risk and downside risk

Risk in a generic sense is the possibility of loss, damage, or harm. For investments more specific definitions of risk can be given.

It can be defined as variability in the expected return - total risk. Or, it can be limited to losses or worse than expected outcomes only – downside risk.

Two possible measures of risk have received support in theory to capture total risk: the variance and the standard deviation of the estimated distribution of expected returns. Whereas downside risk includes concepts such as semi-variance/standard deviation and target semi variance/standard deviations.

Standard deviation as a measure of total risk

Standard deviation and variance are measures of dispersion in return. Standard deviation is the square root of variance. It quantifies the degree to which returns fluctuate around their average. A higher value of standard deviation means higher risk.

Standard deviation is used probably more than any other measure to describe the risk of a security (or portfolio of securities). In any academic study on investment performance; chances are that standard deviation will be used to gauge risk. It's not just a financial tool, though. Standard deviation is one of the most commonly used statistical tools in the sciences and social sciences. It provides a precise measure of the amount of variation in any group of numbers - the returns of a mutual fund, rainfall in Mumbai, or the weight of professional cricket players.

$$SD = \sqrt{\frac{\sum_{i=1}^{n}(x_i - \bar{x})^2}{n}}$$

One of the strengths of standard deviation is that is can be used across board for any type of portfolio with any type of security. The calculation is the same for a portfolio of bonds as it is for a portfolio of growth stocks or any other type of investments.

Standard deviation in interpreted as follows:

Suppose the investment portfolio has a monthly standard deviation of 3.27%. Suppose the expected return for the same is 2%. This means in future there is 66.7% probability that the portfolio return would be between mean return + and – 1 Sigma i.e. 2% -3.27% to 2% +3.27%, where 3.27 is 1 * 3.27%

There is 95% probability that the portfolio return would be between mean return + and – 2 Sigma i.e. 2% -6.54% to 2%+6.54%, where 6.54 is 2 * 3.27%

There is 99% probability that the portfolio return would be between mean return + and – 3 Sigma 2% -9.81% to 2%+9.81%, where 9.81 is 3 * 3.27%

Standard deviation allows portfolios with similar objectives to be compared over a particular time frame. It can also be used to gauge how much more risk a fund in one category has versus the other.

Semi variance / Semi Standard deviation as a measure of downside risk

Semi variance measures the dispersion of the return below the mean return. Target Semi variance measures the dispersion of the return below the target return. In case of symmetrically distributed return, semi variance will be proportional to variance and provides no additional insight. Forecasting asymmetrical distribution of return is very difficult and may not be a good forecast of future risk. Due to these reasons' semi variance is not so popularly used in practice**.**

20.3.2. Portfolio risk versus individual risk

Standard deviation or variance of the returns is used as measure of risk. While computing portfolio risk, it is to be borne in mind that portfolio standard deviation is not the weighted average standard deviation of individual investments in a portfolio (except when these investments have perfect positive correlation with each other, which is practically an impossibility). Portfolio risk depends on the weights of the investments, their individual standard deviations and more importantly the correlation across those investments as shown in the formula below:

$$\sigma_{port} = \sqrt{\sum_{i=1}^{n} w_i^2 \sigma_i^2 + \sum_{i=1}^{n} \sum_{i=1}^{n} w_i w_j Cov_{ij}}$$

Where:

σ_{port} is the risk (standard deviation of portfolio return) of the portfolio;

w_i, w_j are the weights of individual assets in the portfolio, that determined by the proportion of money invested in each of the asset in the portfolio;

σ^2_{port} is the variance of returns of the individual assets in the portfolio;

cov_{ij} is the covariance of the returns of individual assets. Covariance is a product of coefficient of correlation between the assets returns and their individual standard deviations. Poorer the correlation across investments, lower would be the portfolio risk.

20.3.3. Systematic Risk and Unsystematic Risk

Systematic risk is defined as risk due to common risk factors, like interest rates, exchange rates, commodities prices. It is linked to supply and demand in various marketplaces. All investments get affected by these common risk factors directly or indirectly. Systematic risks cannot be diversified away, though it can be hedged. Systematic risk is measured by Beta.

Risks due to sector specific/company specific factors is referred as unsystematic risks. These risks can be diversified away. Alpha return is a reward for bearing unsystematic risk.

Beta

Systematic risk is measured by Beta. Beta relates the return of a stock or a portfolio to the return on market index. It reflects the sensitivity of the fund's return to fluctuations in the market index. Beta calculation requires two series of values for a reasonably long period of time, say 3 to 5 years. First series is your portfolio's daily/weekly/monthly prices. The second series would be the market index on all the dates for which the market prices of your portfolio has been considered.

$\text{Beta} = \text{Cov}(M_r P_r) / \text{Var}(M_r)$

Where
$\text{Cov}(M_r P_r)$ = Covariance between the market's return and the portfolio return
$\text{Var}(M_r)$ = Variance in the Market return

The relationship between the Beta of an individual security with portfolio of securities is linear. Beta of the portfolio can also be calculated by taking the weighted average beta of the individual securities/investments in the portfolio. Thus, if stock A has a beta of 1.2 and stock B has a beta of 1.1 and they make up the portfolio in the ratio of 60:40, the Beta of the portfolio (B_p) would be:

$B_p = (0.60 \times 1.2) + (0.40 \times 1.1) = 1.16$

Beta is fairly easy to interpret. A beta that is greater than one means that the portfolio or stock is more volatile than the benchmark index, while a beta of less than one means that the security is less volatile than the index.

20.3.4. Tracking error

Tracking error is the standard deviation of the differential returns between the portfolio and its target benchmark portfolio total return. Generally indices are used to benchmark portfolios.

Lower the tracking error, closer are the returns of the portfolio to the target Index. If the benchmark portfolio is the market portfolio, tracking error measures deviations from the market return. Tracking Error is always calculated against the Total Returns Index which shows the returns on the Index portfolio, inclusive of dividend. Tracking errors primarily arises due to mismatches between portfolio's risk profile and the benchmark's risk profile.

20.4 Risk-adjusted return

The differential return earned by the portfolio manager may be due to difference in the exposure to risk. Hence it is imperative to adjust the return for the risk. The following are popularly used risk-adjusted return measures. These risk-adjusted performance measures assess the performance of a fund in terms of return per unit of risk.

20.4.1 Sharpe Ratio

One approach is to calculate portfolio's return in excess of the risk-free return and divide the excess return by the portfolio's standard deviation. This risk adjusted return is called Sharpe ratio. This ratio named after William Sharpe. It measures Reward to Variability.

$$S = \frac{\left(R_p - R_F\right)}{\sigma_p}$$

Here,

R_p =Return of the portfolio

R_f = Risk-free return

σ_p=Standard deviation of return on the portfolio

It is to be noted that these three variables should be for the same period. Generally, annualized return and annualized standard deviation is taken for computing Sharpe ratios of the portfolio, for easy comparison across portfolios.

Suppose the annualized standard deviation of the portfolio is 6.50%. Suppose that the annualized return for the same portfolio is 10.50%. The risk-free rate of return is 5.50%.

Then the Sharpe ratio for the portfolio is:

(10.50% - 5.50%)/ 6.50% = 0.7692

This suggests that the fund has generated 0.7692 percentage point of return above the risk-free return for each percentage point of standard deviation.

The Sharpe ratio is a measure of relative performance. It enables investors to compare across investment opportunities. Higher the Sharpe ratio, better is the portfolio's risk adjusted performance. A fund with a higher Sharpe ratio in relation to another is preferable as it indicates that the fund has generated return for every unit of risk.

As can be noted Sharpe ratio adjusts return to the total portfolio risk. Hence it is a useful measure of performance for several mutually exclusive portfolios. The Sharpe ratio is the simplest measure to compute and that is why it is the most widely used risk-adjusted return measure. However, it has a disadvantage: It Ignores diversification potential of portfolio.

20.4.2 The Treynor Ratio

The Treynor measure adjusts excess return for systematic risk. It is computed by dividing a portfolio's excess return, by its beta as shown in equation:

$$T = \frac{\left(R_p - R_F\right)}{\beta_p}$$

where
T = the Treynor measure,
R_p = portfolio return,
R_f = riskless return and
B_p = portfolio beta.

As can be seen the numerator of the equation remains the same as in case of Sharpe ratio. The denominator standard deviation is replaced by Beta.

Suppose in the above case, beta of the fund is precisely 1. The Treynor ratio of the funds would be:

$$\boldsymbol{Treynor\ Ratio} = \frac{(\mathbf{10.50\%} - \mathbf{5.50\%})}{\mathbf{1}} = \mathbf{0.05}$$

This indicates that the fund has generated 0.05 percentage point excess returns for every unit of systematic risk.

Like Sharpe ratio, it is a measure of relative performance. It enables investors to compare across investment opportunities. A fund with a higher Treynor ratio in relation to another is preferable as it indicates that the fund has higher risk premium for every unit of market risk.

As Treynor ratio indicates return per unit of systematic risk. Hence it is a useful measure of performance if an investor wishes to evaluate a portfolio in combination with other actively managed portfolios. Further, it would be an appropriate measure for investors whose wealth is already well diversified, wherein the unsystematic risk is very minimal, and hence the only risk that matters for such investors is excess return over and above the systematic risk.

20.4.3 Sharpe versus Treynor Measure

The Sharpe ratio uses standard deviation of return as the measure of risk, whereas Treynor performance measure uses Beta (systematic risk).

For a completely well-diversified portfolio, the two measures give identical ranking, because total risk and systematic risk would be the same. However, for a poorly diversified portfolio, the raking based on Treynor Ratio could be higher than that on Sharpe ratio as Treynor ratio, ignores unsystematic risk.

Thus, any difference in rankings based on Sharpe Ratio and Treynor ratio is due difference in portfolio diversification levels.

The Sharpe Ratio is more suitable to evaluate a portfolio performance for an investor who has not achieved adequate diversification on his wealth as a whole, and Treynor Ratio should be used for investors who hold their wealth in well diversified portfolios

20.4.4 Sortino Ratio

For computing Sortino Ratio, portfolio's return in excess of the risk-free return is divided by the portfolio's semi-standard deviation[97]. Thus, Sortino Ratio adjusts portfolio's excess return to the downside risk.

This ratio may be very appealing to some investors who view risk as chances of losing money, rather the uncertainty around expected return.

Sortino Ratio = $(R_p – R_f)$/ Semi Standard deviation of the portfolio
R_p = Return of the portfolio
R_f = Risk-free rate

Like Sharpe and other risk adjusted return ratio, higher level of Sortino Ratio indicates superior performance.

20.4.5 Information Ratio (Appraisal ratio)

If we wish to determine whether or not an observed alpha is due to skill or chance, we can compute information (appraisal) ratio.

IR = $(R_p – R_b)$/Stdev $(_{p-b})$
where
IR = the information ratio,
R_p = Return on the portfolio
R_b = Return on the benchmark
Stdev $(_{p-b})$ = Standard deviation of the observations of differences between the return of the portfolio and return of the benchmark

[97] Semi Standard deviation is calculated as the average of all deviations of actual returns of the portfolio below the mean portfolio return, i.e. the average of negative deviations. In a portfolio context, mean could be replaced with any desired threshold return, which the investor could consider as downside risk.

The numerator in the ratio represents the fund manager's ability to use his skill and information to generate a portfolio return that differs from the benchmark (e.g. BSE Sensitive index or Nifty 50) against which his performance is being measured. The denominator could be considered as a measure of the amount of residual (unsystematic) risk that the investor incurred in pursuit of those excess returns. The numerator is often referred to as the active return on the portfolio whereas denominator is referred to as the active risk. The point to be noted is that active risk is nothing but tracking error of the portfolio.

The following table will explain the calculation of Information Ratio

Year	Security's Return	Market Return	Difference
1	14	8	6
2	10	6	4
3	13	12	1
4	15	10	5
5	18	9	9
Mean Return	14	9	5
Risk	2.92	2.24	2.92
Information Ratio			**1.715**

20.4.6. M^2 Measure:

Franco Modigliani and his granddaughter Lea Modigliani (1997) derived another risk-adjusted performance measure. They adjusted the risk of the portfolio to match the risk of the market portfolio. For such a risk adjusted portfolio, they calculated the return, and compared it with the market return to determine portfolio's over or underperformance. To adjust the risk of the portfolio, they resorted to levering or de-levering. After the standard deviations have been equalized, return can be directly compared with the return in the market. A high (low) indicates that the portfolio has outperformed or has generated a surplus (under-performed or generated a shortfall) the market portfolio.

Suppose the portfolio has generated a return of 35%. The market (benchmark) portfolio has generated a return of 28%. The treasury bill rate is 6%. The standard deviation of the portfolio is 42%. The standard deviation of the market portfolio is 30%. Now M^2 is the risk adjusted return of the portfolio, which needs to be compared to that of the Market Return. This can be achieved in two ways. One intuitively and two theoretically following the capital market line (CML) concept. Both the approaches are shown below.

Intuitive approach (the way M^2 is defined)

The given Portfolio Return is 35% and this needs to be converted into an excess return. That means the risk free rate needs to be removed from it. This is because the risk free rate is generated anyway without any risk, and hence when any return needs to be attributed to the amount of risk in the portfolio, then it cannot be the total return, rather it should be the excess return.

So the excess return generated by the portfolio is now 35 – 6 = 29%. The relevant risk of this return of the portfolio is 42%. While that of the market is 30%. The M^2 measure requires to adjust the portfolio risk to equate it to that of the market risk. Therefore 29% need to be multiplied by 30% and divided by 42%, giving 29 * (30/42) = 20.71%. To this we add back the risk free rate to get the M2 measure, which is nothing but the return of the portfolio in case its risk was the same as that of the benchmark portfolio's risk. That comes to 20.71% + 6% = 26.71%.

Now this M^2 can be compared with the market that is 28%. This shows that the portfolio has underperformed the benchmark by 26.71% - 28% = 1.29% (shortfall).

M^2 =[(Benchmark Risk/Portfolio Risk)*(Portfolio Return – Risk Free Return)] + Risk Free Return

M^2 = [(30/42) * (35 – 6)] + 6% = 26.71%

If we juggle the above formula a little we also can appreciate the following expression.

M^2 = (Sharpe Ratio of the Portfolio * Benchmark's Risk) + Risk Free Return

M^2 = [((35 – 6) / 42) * 30] + 6% = 26.71%

THE Capital Market Line (CML) APPROACH:
In this approach weights are assigned to the investment in the risky portfolio and the risk free asset. The weight for the risky portfolio would be the ratio of benchmark market portfolio's risk and the portfolio's risk. The weight in the risk free asset would be (1 – weight in the risky portfolio).

30/42 = 0.714 in P; (1-0.714) =0.286 in T-bills

Now M^2 is the weighted average return calculated as follows.

M^2 = (0.714) (0.35) + (0.286) (0.06) = 26.7%

Since M^2 is less than the market by 1.3%, (28%-26.7%) the managed portfolio under performed. This underperformance is also referred to as shortfall.

20.5 Performance Evaluation: Benchmarking and peer group analysis[98]

Performance evaluation is a relative concept. After measuring the performance, next important step is to evaluate it against some suitable benchmark or similar portfolios to address more important issues like how the returns measure up to the comparable investment opportunities.

Performance evaluation also enable the investors to determine if the portfolio manager has enhanced the portfolio's value beyond what could be obtained from a passive indexed strategy, and whether the portfolio management fees are justified.

Performance evaluation involves benchmarking and peer group analysis.

20.5.1 Characteristics of indices for Benchmarking

GIPS defines Benchmark as an independent rate of return (or hurdle rate), forming an objective test of the effective implementation of investment strategy. It is a standard or point of reference. It is a collection of investment opportunities or securities or risk factors which represent the investment characteristics and investment approach of the portfolio being evaluated against it.

Indices make popular choices for benchmarking portfolio. The number and variety of available indices make selection of suitable benchmarks a daunting task. A good benchmark increases the proficiency of performance evaluation hence while choosing an index as benchmark care should be taken to ensure that it is representative of the portfolio.

A good benchmark should be able to satisfy the following criteria:

- The identity of constituents and their weights in the benchmark are clearly defined.
- The benchmark is investable, in other words it is possible to have a passive exposure to the same.
- The benchmark is consistent with the portfolio's investment approach. For example, if the portfolio's investment approach is to invest in blue-chip stocks, the benchmark should also consist of blue-chip stocks. If the investment style of the portfolio is value investing, the benchmark should be of the same orientation.
- The benchmark is having the same risk-return profile as the portfolio.
- The performance of the benchmark is measurable.

[98] Candidates can also visit the link https://www.apmiindia.org/apmi/WSIAConsolidateReport.htm?action=showReportMenu for performance analysis

20.5.2 Customized Benchmark

Sometimes market based indices may not meet the above criteria of a good benchmark, given the portfolio manager's investment strategies and style. Such situation demands for appropriate customized benchmark. When the portfolio managers follow a certain type of investment strategy and style, they create an investment universe reflecting the same to focus their research activities. The portfolio managers then select the most attractive securities from the investment universe. Such investment universes can act as benchmarks for portfolio evaluation when market-based indices are not found to be valid. The advantage of such benchmarks is that they meet the requirement of valid benchmarks. The disadvantage is that the costs of construction and maintenance of these benchmarks would be much higher than the fee paid for using market-based indices.

20.5.3 Managers' universe analysis

Managers' universe analysis or peer group analysis is also a very popular way of conducting performance evaluation. The median portfolio or the universe of the portfolio managers with the similar investment approach and strategies can be taken as the yardstick to evaluate the performance of the portfolio. Investors have a natural interest in knowing how their portfolio managers are performing compared to others. Portfolio tracking firms have developed databases to facilitate managers' universe analysis. They rank the portfolios with similar investment characteristics and risk-return profile on some risk-adjusted return measure.

20.6. Performance attribution analysis

The second phase of performance evaluation is performance attribution. There are different ways of doing the attribution analysis, but the one propounded by Fama remains the dominant framework.

The underlying theme behind various attribution analysis approaches is to dissect the return into majorly two components: return driven by the benchmark and the differential return.

And then identifying and quantifying the sources of differential return to primarily establish whether it was driven by skill of the portfolio manager or some random factors (in layman terms luck).

20.6.1. Assets and Sector Allocation

Differential return can be achieved by choosing to over-invest in (or overweight) a particular economic sector that outperformed the total benchmark (sector allocation) for that period or

to underinvest in or avoid (or underweight) an asset category that underperformed the total benchmark (*asset allocation*). It may be noted here that we are assuming that a particular sector is performing better or worse than the overall return of the benchmark portfolio.

Allocation effect $= \Sigma_i \left[\left(W_{ai} - W_{pi} \right) \times \left(R_{pi} - R_p \right) \right]$

W_{ai} and W_{pi} = the investment proportions of the $_i^{th}$ market segment (i.e. asset sector / industry group) in the active manager's portfolio (W_{ai}) and the benchmark policy portfolio(W_{pi}) respectively

R_{pi} = the investment return to the $_i^{th}$ market segment in the benchmark portfolio
R_p = Total return of the benchmark portfolio

Allocation Effect can also be extracted by another approach also, where there is no need to assume whether a particular sector or asset class is generating superior returns than the overall benchmark portfolio return. Under these circumstances, the Allocation Effect can be extracted as follows

Allocation Effect = $\sum_{i=1}^{n} [(R_{pi})\ x(W_{ai} - W_{pi})$

The terms used in the above equations have the same definitions as described above.

20.6.2. Selection

Differential return can also be achieved by selecting securities that performed well relative to the benchmark or avoiding benchmark securities that performed relatively poorly.

Selection Effect $= \Sigma_i \left[\left(W_{ai} \right) \times \left(R_{ai} - R_{pi} \right) \right]$

W_{ai} = the investment proportions of the $_i$th market segment (i.e. asset class, sector / industry group) in the active manager's portfolio
R_{ai} and R_{pi} = the investment return to the $_i$th market segment in the active manager's portfolio (R_{ai}) and the benchmark portfolio (R_{pi}), respectively

One may note that the actual weights assigned by the fund manager have been taken, here to weight on the excess returns generated due to selection. This is logical, because the actual investment has been made in the actual proportion only. However this component could be further decomposed theoretically, which is depicted in the following section 20.6.2.

20.6.3. Portfolio Performance Attribution Decomposition Analysis

While the above two approaches serve well to extract the contribution of sectoral allocation and asset selection in a self-contained manner, but they might not be adequate to decompose and explain the overall superior return of an actively management portfolio over its chosen benchmark portfolio. This requires the following step by step analysis. The following analysis is a much clearer decomposition approach compared to the previous two, and hence it is strongly advised not to compare the formulas in this approach and the previous approach, inspite of the names of the components appear same.
When a fund manager creates a portfolio of 'n' assets classes with "Wai" weights to each of them, and when each of the allocated asset classes generates "Rai" return, then the overall return the fund manager generates can be depicted as follows:

Overall actively managed fund's return (Ra) = $\sum_{i=1}^{n} W_{ai}R_{ai}$

Similarly, the respective benchmark with which this fund could be compared would generate the benchmark return (Rp) = $\sum_{i=1}^{n} W_{pi}R_{pi}$ the notation and the subscripts are consistent with those in the previous paragraphs.

Therefore, if one is interested to find out whether the fund manager has generated a superior return over the respective benchmark portfolio, the following analysis would provide the answer:

Superior return = Ra – Rp OR $\sum_{i=1}^{n} W_{ai}R_{ai}$ - $\sum_{i=1}^{n} W_{pi}R_{pi}$ OR we could also use

$$\sum_{i=1}^{n}(W_{ai}R_{ai} - W_{pi}R_{pi})$$

It has been explained in the previous paragraphs that the superior performance of a fund manager can be attributed to her asset allocation skills, her security selection skills, and the combination of the two.

The component of asset allocation arises because the fund manager has assigned weights differently than the comparable benchmarks portfolio. So, assuming that the individual assets classes have not generated any superior return than those in the benchmark portfolio, the excess generated by the fund manager ONLY DUE TO ASSET ALLOCATION would be extracted as:

$$\sum_{i=1}^{n}[(R_{pi})\, x(W_{ai} - W_{pi})$$

It may be noted that “Rpi” is the return generated by each of the individual asset classes in the benchmark portfolio, and “Wai” is the weight assigned by the fund manager, and “Wpi” is the weight in the benchmark portfolio.

In the same manner if one is interested to extract the excess return generated ONLY DUE TO ASSET SELECTION, then one should keep the weights similar to those in the benchmark and then use the following formula:

$$\sum_{i=1}^{n}[(W_{pi})\ x(R_{ai} - R_{pi})$$

Now these two components when added together would not add up to

$$\sum_{i=1}^{n}(W_{ai}R_{ai} - W_{pi}R_{pi})$$

and hence the residual component needs to be attributed to the INTERACTIVE effect or the component which is due to differential weighting (allocation) and also differential return generation (selection), which is calculated as follows:

$$\sum_{i=1}^{n}(W_{ai} - W_{pi}) * (R_{ai} - R_{pi})$$

Now when all these terms are added up the final result would lead to

$$\sum_{i=1}^{n}(W_{ai}R_{ai} - W_{pi}R_{pi})$$

This is the popular attribution decomposition analysis.

Let us illustrate the entire process with a hypothetical example. A fund has allocated 75%, 15% and 10% of the fund to Equity, Fixed Income and Money Market segments, respectively. Whereas the respective benchmark has the same, respectively, in the proportion of 50%, 30%, and 20%. The benchmark returns have been 6%, 1.5% and 0.3% for the Equity, Fixed Income and Money Market segments, and the fund has generated 8%, 2%, and 0.5%, respectively during the same period. As an analyst if you would like to assess the performance of the fund manager and attribute the superior or inferior performance to Asset Allocation, Asset Selection, and the Interactive Effects, the following table would depict the same. It is evident that the fund manager has generated 2.84% superior return than the comparable benchmark. When decomposed, Asset Allocation has contributed 1.25%, Asset Selection 1.19% and the Interactive Effect has contributed 0.40%, to wards the 2.84% excess return. The values are arrived using the same formulas discussed above in section 20.6.3

Asset Class	FundWt	BenchWt	FundRet	BenchRet	DiffWt	DiffRet
Equity	0.75	0.5	8	6	0.25	2
Fixed Income	0.15	0.3	2	1.5	-0.15	0.5
Money Market	0.10	0.2	.5	0.3	-0.1	0.2
Fund Return	6.35					
Bench Return	3.51					
Fund's Excess Return	2.84					
Decomposition						
Asset Allocation	1.25					
Asset Selection	1.19					
Interactive Effect	0.40					
Total	2.84					

20.6.4. Local currency versus foreign currency denominated investment return

An Indian investor who buys and sells securities that are denominated in currencies other than the Indian rupee need to calculate the return after adjusting the fluctuation in Indian rupee against those foreign currencies, as the return earned on investments denominated in foreign currencies would not be the same when converted back to rupee term. The fluctuations in currency values can either enhance or reduce the returns associated with foreign investments. This is called currency risk.

Consider the following scenario:

An Indian investor has invested Rs. 50 lacs in a US equity fund when Rupee was 70 per US dollar. The fund has generated a return of 15%. During the period rupee appreciated to 65 per US dollar. What is the return investor has made?

Capital investment in US based Equity fund (t_0) = $ 71,428.57

Investment Value (t_1) = (71,428.57 x 15%) + 71428.57 = 82,142.86

Investment value in Indian Rupee = 82,142.86 x 65 = 53,39,285.62

Return in Rupee term = Rs. 53,39,285.62 – Rs. 50,00,000 = Rs. 3,39285
i.e. Return made is 6.79 % and not 15% . The difference between the two is approximately equal to the appreciation of Indian rupee in percentage terms from Rs.70/$ to Rs.65/$

20.7 Performance reporting to the Investor

SEBI Portfolio Managers regulation state the following regarding performance reporting to the investors:

The portfolio manager shall furnish periodically a report to the client, as agreed in the contract, but not exceeding a period of three months and as and when required by the client and such report shall contain the following details, namely: -

(a) the composition and the value of the portfolio, description of securities and goods, number of securities, value of each security held in the portfolio, units of goods, value of goods, cash balance and aggregate value of the portfolio as on the date of report;
(b) transactions undertaken during the period of report including date of transaction and details of purchases and sales;
(c) beneficial interest received during that period in the form of interest, dividend, bonus shares, rights shares, etc;
(d) expenses incurred in managing the portfolio of the client;
(e) details of risk foreseen by the portfolio manager and the risk relating to the securities recommended by the portfolio manager for investment or disinvestment;
(f) default in payment of coupons or any other default in payments in the underlying debt security and downgrading to default rating by the rating agencies, if any;
(g) details of commission paid to distributor(s) for the particular client.

Portfolio Manager shall present the Time weighted rate of return (TWRR) of the Investment Approach along with the trailing return of the selected benchmark when communicating/advertising/publishing/mentioning performance of an investment approach. Portfolio Manager shall present the Extended Internal Rate of Return (XIRR) for each investment approach the investor invests in when reporting performance to an investor. This shall be accompanied by the minimum, maximum and median XIRR return generated across all investors in each of the IA, the investor has invested in. The TWRR of the respective IA(s) and the trailing return of the benchmark(s) selected shall also be presented separately. The disclosure should also be accompanied by the following disclaimer:

"Please note that performance of your portfolio may vary from that of other investors and that generated by the investment approach across all investors because of (a) the timing of inflows and outflows of funds and (b) difference in the portfolio composition because of restrictions and other constraints."[99]

20.8 Valuation of Securities by Portfolio Managers

Association of Portfolio Managers in India (APMI) shall prescribe standardized valuation norms for Portfolio Managers. Valuation of the portfolio debt and money market securities by portfolio managers shall be carried out in accordance with these standardized valuation norms prescribed by APMI.

[99] Candidates are advised to read SEBI Circular (SEBI/HO/IMD/IMD-PoD/P/CIR/2022/172) dated December 16, 2022.

APMI shall empanel valuation agencies for the purpose of providing security level prices to Portfolio Managers. Portfolio Managers shall mandatorily use valuation services obtained only from one or more of such empanelled valuation agencies for the purpose of valuation of debt and money market securities in portfolios managed by them. The ultimate responsibility for fair valuation shall be that of the Portfolio Manager.

20.9 Due Diligence and Portfolio Manager selection

Selecting a portfolio manager is a complex process. It involves analysing lot more than just returns. Investors are expected to carry out a detailed due diligence process before selecting their portfolio managers. Due diligence involves thorough quantitative and qualitative analysis of the portfolio manager's reputation, key personnel and operations.

Investors should understand the investment process, investment strategies, investing styles to appreciate how the investment returns are generated and gauge the likelihood of the performance persisting in future for the given investment process.

The first step in the direction of selecting the portfolio manager is to draft the investment policy statement and determine the asset allocation. Then it becomes easier to select the portfolio manager who offers the "best" means to implement or express those decisions.

Portfolio Managers can be evaluated on the basis of their investment philosophy, investment approach, investment process, strategies, styles and past performance compared against a benchmark or managers' universe. Attention can also be paid to the major provisions in the contract with the portfolio managers. Of course, the management fees and the cost, will be a crucial factor too in evaluating the portfolio managers.

20.10 Global Investment Performance Standards (GIPS®)

The Global Investment Performance Standards (GIPS®) provide the investment community with a set of ethical standards for investment management firms to follow when presenting their performance results to potential clients. The standards serve to provide greater uniformity and comparability among investment managers, without regard to geographic location, and to facilitate a dialogue between investment managers and their prospective clients about the critical issues of how the manager achieved historical performance results and future investment strategies.

Firms that claim compliance with GIPS standards must adhere to rules governing not only rate of return calculation but also the way returns are displayed in performance communications. These standards have evolved over a period of time to improve reliability of performance information and standardize calculation methodology.

These standards are broadly accepted and endorsed by the investment management industry. For example, GIPS mandates use of time weighted rate of return. SEBI Portfolio Managers Regulation 2020 has also prescribed the use of TWRR for communicating the past performance.

20.11 GIPS Advertisement Guidelines

The GIPS Advertising Guidelines attempt to serve as industry global best practice for the advertisement of performance results. The GIPS Advertising Guidelines do not replace the GIPS standards nor do they absolve firms from presenting performance presentations that adhere to the requirements of the full GIPS standards. The Guidelines only apply to firms that already satisfy all of the requirements of the Standards on a firm wide basis and claim compliance with the Standards. Firms that claim compliance can choose to advertise that claim using the GIPS Advertising Guidelines.

The Guidelines represent the minimum disclosure and presentation requirements for firms that include a claim of compliance in their advertisements

All advertisements that include a claim of compliance must include the following:

1. A description of the firm.
2. How an interested party can obtain a presentation that complies with the requirements of GIPS and/or a list and description of all firm composites.
3. The GIPS Advertising Guidelines Compliance Statement.
4. A description of the strategy being advertised.
5. Period-to-date composite performance results
6. Composite results for either or both of the following time periods:

   a. 1-, 3-, and 5- year annualized composite performance returns with the end-of-period date clearly identified (or annualized period since composite inception if inception is greater than 1 or less than 5 years). Periods of less than one year must not be annualized. The annualized returns must be calculated through the same period of time as presented in the corresponding compliant presentation.

   b. 5 years of annual composite performance returns (or since composite inception if inception is less than 5 years). The annual returns must be calculated through the same period of time as presented in the corresponding compliant presentation.

7. Whether performance is shown gross and/or net of investment management fees.
8. The appropriate composite benchmark total return for the same periods for which the composite return is presented. Firms must also disclose the name and a description of the benchmark. (The appropriate composite benchmark return is the same benchmark total return as presented in the corresponding compliant presentation.) If

no benchmark is presented, the advertisement must disclose why no benchmark is presented.

9. The currency used to express performance.
10. The description of the use and extent of leverage and derivatives, if leverage or derivatives are used as an active part of the investment strategy (i.e., not merely for efficient portfolio management) of the composite. Where leverage/derivatives do not have a material effect on returns, no disclosure is required.
11. When presenting non-compliant performance information for periods prior to 1 January 2000 in an advertisement, firms must disclose the period(s) and which specific information that is not compliant as well as provide the reason(s) the information is not in compliance with the GIPS standards.

Chapter 20: Sample Questions

1. The measure of performance which divides the portfolio's Excess Return by the portfolio's beta is the _____.

a. Sharpe measure.
b. Jensen measure.
c. Fama measure.
d. Treynor measure.

2. What is the expected return of the three stock portfolio described below?

Common Stock	Weight	Expected Return
Ando Inc.	25%	12%
Bee Co.	50%	10%
Cool Inc.	25%	16%

a. 12.44%
b. 12.22%
c. 12.33%
d. 12%

3. Sharpe's performance measure divides the portfolio's excess return by the _____.

a. Standard deviation of portfolio returns.
b. Variance of the rate of return.
c. Slope of the fund's characteristic line.
d. Risk free rate.

4. Portfolio performance measure of "Information Ratio" _____.

a. adjusts portfolio risk to match benchmark risk.
b. compares portfolio returns to expected returns under CAPM.
c. evaluates portfolio performance on the basis of return per unit of risk.
d. calculates average differential return over the benchmark return per unit of variability of differential returns over that of the benchmark's returns.

5. USE THE FOLLOWING INFORMATION FOR THE NEXT TWO PROBLEMS
The data presented below has been collected at this point in time.

Fund	Beta	Standard Deviation (%)	Return (%)	R_f (%)
AAA	1.00	5.02	17	6
BBB	1.05	4.04	14	6
CCC	0.89	3.02	10	6
Market	1.00	3.50	12	6

i. Compute the Sharpe Measure for the AAA fund.

b. 4.49
c. 2.74
d. 2.19
e. 1.70

ii. Compute the Jensen Measure for the BBB fund.

a. 4.49
b. 2.74
c. 2.19
d. 1.70

Sample Caselets

1. A portfolio manager would like to retain atleast 10% of the investible funds in the form of cash. Competitive pressures force him to target portfolio return of 18%. He is confident of generating a return of 19% on the portfolio, and the cash would generate a maximum of 3% return. With Rs.100 crores of investible funds for management, how much is the liquidity policy dragging down the overall portfolio return from the target portfolio return in rupee terms.

a) Rs. 0.6 crores
b) Rs. 1.6 crores
c) Rs.0.06 crores
d) Rs.0.16 crores

Answer: a) Rs. 0.6 crores
Explanation: (0.9*0.19) + (0.1 * 0.03) = 17.4%; (100*0.18) - (100 - 0.174) = 0.6 crores

2. A portfolio generates 25% return during a particular year, with a volatility of 18%. In the same year, the benchmark index generated 22% with a volatility of 15%. In case the risk free rate of return during the same time is 8%, by how many basis points did the portfolio beat the benchmark? How do you measure the risk-adjusted performance between the two, and how much is it?

a) 300; Sharpe Ratio; 0.01
b) 300; Treynor Ratio; 0.025
c) 300; Sharpe Ratio; 0.025
d) 300; Treynor Ratio; 0.01

Answer: a) 300; Sharpe Ratio; 0.01
Explanation: The excess returns of the Portfolio are 25 - 8 = 17%; and that of market are 22 - 8% = 14%. Therefore, the portfolio beat the benchmark by 300 basis points. On a risk adjusted basis the Sharpe ratio of the portfolio is 17/18 = 0.944; and that of the market is 14/15 = 0.933.

3. If a portfolio and the index display a volatility of 18% and 15%, respectively, for generating returns of 25% and 22% respectively. Do you think that the portfolio actually has beat the market adjusting its risk to that of the market? Assume a risk free rate of return to be 8%.

a) Yes, by 0.167%
b) No, it falls short by 6.4%
c) Yes, approximately 17.4%
d) No, it falls short by 0.167%

Answer: a) Yes, by 0.167%
Explanation: Msquare =[(25 - 8) * (15/18)] + 8 = 22.167
Amount by which it beat the market is Msquare - (22) = 0.167%

Formula One for M Square = (Sharpe Ratio of the Portfolio * Standard Deviation of the Index)
Formula Two for M Square = [(Sharpe Ratio of the Portfolio * Standard Deviation of the Index)+Rf]
Formula Three for M Square = [(Std.Dev of Index / Std.Dev of Port) * (Return of Port)] + [(1 - (Std.Dev of Index / Std.Dev of Port))*Risk Free Rate)]

4. An investor approaches a PMS provider with a 5 year plan of investment. She starts with Rs.50 lakhs at the beginning of the first year. Later at the beginning of each year from the 2nd to 4th years, she invests Rs.45 lakhs, Rs.35 lakhs, Rs. 60 lakhs, and Rs. 50 lakhs. The fund created by the manager generates net annual returns of 15%, 12%, -10%, -8%, 25%, for each of the 5 years, respectively, after all the charges. What is the time weighted rate of return to the investor ignoring taxes?

a) 5.92%
b) 6.80%
c) 14%
d) 13.84%

Answer: a) 5.92%
Explanation: Calculate the TWRR as [((1.15)*(1.12)*(0.9)*(0.92)*(1.25))^(1/5)]-1

5. An investor approaches a PMS provider with a 5 year plan of investment. She starts with Rs.50 lakhs at the beginning of the first year. Later at the beginning of each year from the 2nd to 4th years, she invests Rs.45 lakhs, Rs.35 lakhs, Rs. 60 lakhs, and Rs. 50 lakhs. The fund created by the manager generates net annual returns of 15%, 12%, -10%, -8%, 25%, for each of the 5 years, respectively, after all the charges. What is the money weighted rate of return to the investor ignoring taxes?

a) 6.09%
b) 5.86%
c) 5.92%
d) 7.50%

Answer: a) 6.09%
Explanation: Use the Excel function of IRR where each year's cashflows are given as negative values and the final value of the fund is given as positive value, and some guess rate of return is given for EXCEL to calculate the return

6. An investor approaches a PMS provider with a 5 year plan of investment. She starts with Rs.50 lakhs at the beginning of the first year. Later at the beginning of each year from the 2nd to 4th years, she invests Rs.45 lakhs, Rs.35 lakhs, Rs. 60 lakhs, and Rs. 50 lakhs. The fund created by the manager generates net annual returns of 15%, 12%, -10%, -8%, 25%, for each of the the 5 years, respectively, after all the charges. What is simple arithmetic average rate of return for the investment horizon?

a) 6.80%
b) 6.09%

c) 14%
d) 13.84%

Answer: a) 6.80%
Explanation: Add all the returns with the sign and divide it by 5

7. A portfolio manager is about to report the gross and net returns to the investor on a Rs. 50 lakhs investment made a year ago. The investor sets a target return of 15% and the portfolio manager negotiated a 20% management fee, over and above a fixed annual fee of 1.5% over the average value of asset under management. The other charges are 0.5% of the gross value of investment. What are the gross and net returns to be reported if the fund generated 20% during this year, with an exit load of 2%.

a) 20% and 14.86%
b) 19.9% and 14.86%
c) 14.86% and 15%
d) 22% and 15%

Answer: a) 20% and 14.86%
Explanation: Follow the illustration 20.2.4 in the study material.

8. An investor aged 40 years approaches a PMS manager with a request to manage his surplus wealth, which is left out after completely diversifying, and investing in all other traditional and required investments. This fund can be invested in a 100% equity portfolio. The fund manager creates such a portfolio which generates 25% return in the first year, when the relevant benchmark generated only 20%. However, the volatilities of both these portfolios were 22% and 15%. If the investor's portfolio displayed a correlation of 0.75 with that of the benchmark portfolio, and the relevant risk free rate was 6% for the 1 year period. What is the appropriate metric the fund manager should use to show his performance? (Choose between Sharpe's and Treynor's only)

a) Treynor's Measure, 17.27%
b) Treynor's Measure, 14%
c) Sharpe's Measure, 0.85
d) Sharpe's Measure 0.93

Answer: a) Treynor's Measure, 17.27%
Explanation: Only Treynor's measure has to be used because the investor has fully diversified his wealth, and return compensating systematic risk should suffice. Beta = 0.75 * (22/15) = 1.1. the Treynor's measure of the fund is (25 - 6) / 1.1 = 17.27%; While that of the benchmark index is (20-6)/1 = 14%; Fund Sharpe Ratio (25-6)/20 = 0.85; Index Sharpe Ratio = (20-6)/15 = 0.933

9. A fund manager chooses an investment for an investor which has shown a historical correlation of 0.8 with the benchmark index. If the volatility of this investment is 20%, and that of the benchmark index is 18%, the investor's tax bracket is 25%, the relevant risk free rate is 6%, and the historical market risk premium is 10%, then how much return should the manager generate on this investment (net of all charges and fees) before tax for the investor? Roundup the return to two decimals.

a) 19.87%
b) 18.67%
c) 22.82%
d) 20%

Answer: a) 19.87%
Explanation: Beta = 0.8 * (20/18) = 0.89; CAPM return expected by the investor = 6+(0.89 * 10) = 14.9%. This is the post-tax return. So for pre-tax it should be 14.9 / 0.75 = 19.87%

CHAPTER 21: PORTFOLIO REBALANCING

LEARNING OBJECTIVES:

After studying this chapter, you should know about:

- Why rebalancing is needed
- The Cost and difficulties of rebalancing
- The difference between Time versus threshold based rebalancing
- Buy and Hold Strategy versus Constant Mix Strategy
- Constant Proportion Portfolio Insurance, CPPI

21.1 Need for rebalancing

Portfolio management is a dynamic process. It does not end with portfolio construction. After the portfolio is constructed it requires monitoring and rebalancing. The need for rebalancing arises due to changes in market conditions impacting assets' risk return forecasts and/or the circumstances of the investors.

Over a period of time, securities and assets weights may drift from the desired levels as a result of market movements. Prices of all the assets in the portfolio do not change by the same proportion. Prices of high return assets change faster than low return assets, causing the portfolio asset mix to deviate from target weights. The high return assets are typically with high risk also. So, if the portfolio is not rebalanced, it will change the risk exposure levels of the portfolio, the portfolio may then become more concentrated from the desired levels. It will undermine the desired levels of diversification.

Rebalancing is also required when the investors' needs or circumstances change. For individual investors changes in employment, marital status, birth of children may affect the investment goals and objectives and also the amount of money available for investments. Investors liquidity requirements may also undergo changes. Hence, it is desirable that the Investment Policy Statement (IPS) contains well defined rebalancing policy addressing the following issues:

(1) adjustments needed in the investors' target asset classes weights to reflects the changes in the needs, circumstances and risk appetite.

(2) the set of rules that guide the process of restoring the portfolio's original exposures to various asset classes in times of changing capital market expectations.

21.2 Costs and difficulties of rebalancing

While drafting a rebalancing policy, a trade-off is to be arrived between the costs of rebalancing versus benefits of rebalancing. After the strategic asset allocation is made, any drift from the same needs to be monitored and rebalanced. Rebalancing is the process of aligning portfolio weights to the strategic asset allocation. It is an important step in portfolio management process and benefits the investors by reducing the present value of expected loss due to not rebalancing i.e. deviating from the optimal strategic asset allocation.

The costs of rebalancing involves frequent monitoring and valuation of the portfolio and executing trades to bring back the desired exposures to various asset classes. Different assets involve different costs of transactions. For example, international equity has higher transaction costs than domestic equity. Illiquid assets like private equity, or direct real estate pose more complications in rebalancing than listed equity.

Taxes are also costs which need to be recognized while drafting rebalancing policy. While rebalancing, the portfolio managers may sell the appreciated assets and buy the depreciated asset with a view to restore the desired asset mix. Sale of an appreciated asset attracts tax liabilities and hence it is a cost of rebalancing the portfolio.

21.3 Periodicity of rebalancing

A decision needs to be taken with regard to periodicity of rebalancing and the tolerance levels of drift. The simplest approach to rebalancing is time based (calendar) rebalancing, which involves rebalancing the portfolio after specified period of time i.e. monthly, quarterly, half yearly or annually. Alternatively, threshold based rebalancing can be decided where tolerable percentage deviations are stated.

21.3.1 Time versus threshold based rebalancing

Time based rebalancing is simpler than threshold based rebalancing. It just requires rebalancing a portfolio to target weights on a periodical basis like monthly, quarterly, annually etc.

Rebalancing the portfolio quarterly is a popular choice. It does not require monitoring of the portfolio during the rebalancing period. However, the drawback of this method is that it does not take into consideration the fluctuations in the market. On the date of rebalancing, the portfolio may be very close to the strategic asset mix or very far from it. If it is very close, then rebalancing it may pose more costs then benefits. If it is very far then it means that portfolio was allowed to drift away significantly and during the period it has been exposed to different risk levels.

Threshold based rebalancing permits tighter control of the asset mix compared with time rebalancing. It requires setting the trigger points. For example, if a balanced (hybrid) portfolio has the 60% target allocation to equity, trigger points can be set at 50% & 70%. The portfolio will require rebalancing when the value of the equity falls below 50% or rises above 70%. This range will also act as a corridor for tactical asset allocation by the portfolio managers.

Threshold based rebalancing requires decision regarding the tolerance levels. It also requires frequent monitoring of the portfolios. Rebalancing of portfolio can happen on any date. An important aspect of threshold based rebalancing is the decisions regarding the trigger points. Transactions costs play a very important role in deciding the corridors. Assets that have higher transactions cost normally warrant higher tolerance levels of deviations. Assets classes having higher volatility usually have lower tolerance thresholds as they have higher propensity of drifting if left unattended for a longer period.

21.4 Buy and Hold Strategy

Buy and hold is a passive strategy of deciding the strategic asset allocation mix and then going with the flow i.e. doing nothing about it subsequently. With this do nothing strategy the asset mix drifts significantly over a period of time from what was originally decided. In this kind of strategy, some investment is made in safe assets to provide a floor value as the investments made in safe assets do not fluctuate much. The amount invested in the risky assets is to provide the appreciation. The portfolio value becomes a function of the performance of risky assets and there would be no limit on the upside potential of the portfolio.

21.5 Constant Mix Strategy

Constant mix strategy is actually the rebalancing process. It is “do something” strategy. Once the strategic asset allocation is decided, periodically trading will take place to reset the asset mix to avoid any drift. The benefits of constant mix strategy is that it helps in maintaining market risk exposures as against the buy and hold strategy which generally increases the market risk.

21.6 Constant Proportion Portfolio Insurance

Constant Proportion Portfolio Insurance (CPPI) is an actively managed rebalancing strategy that allocates wealth between risk-free assets such as government bonds and risky assets such as stocks. CPPI aims to provide the upside potential of investment in risky opportunities with the downside protection of the risk-free asset.

In order to protect downside risks, the value below which the portfolio should not drop can be pre-defined. This value is referred as floor. Floor is the present value of desired level of capital protection. For example, if it is desired that the portfolio value on maturity of a 3-year product, should not be below the initial investment of Rs.100, the Present Value of Rs.100 to

be received three years from now, discounted at the risk free rate can be taken as the floor (100/((1+r)^3)). Let's assume that the floor is Rs.90 (a round number for avoiding the strain of reading a fraction).

In order to capture the upside potential in a risky asset, the investment amount in the risky asset is calculated as a multiple of the difference between the "initial value and floor value" Rs.10 in the above case, which is also known as cushion or gap. Say, if the multiplier is 5 times, the investment in the risky asset could be Rs.50 (5 times the cushion of 10). The balance of Rs.50 would be parked in the risk free asset. CPPI enables investment in risky assets and risk free asset. A defined algorithm determines the proportion of the portfolio invested in each of them.

Investments in risky assets = m * (Portfolio Value – Floor Value)

Where:

m is a multiplier with fixed constant value. It defines the leverage i.e. number of times the cushion/gap will be invested in stocks and other risky opportunities.

Now, if the risky asset value touches Rs.40, the total portfolio value will touch the floor value of Rs.90 (Rs.50 in risk free asset and Rs.40 the decreased risk asset value). If it drops below Rs.40, then there is a danger of loss of capital protection. Therefore, it is required to find out how much risky assets can fall in worst case scenario. If it is highly improbable that the risky asset will lose Rs.10 in a single day, then it is possible to take the risk of multiplying the cushion and taking up the upside potential of the risky asset. Higher the multiple used, higher is the expected upside potential but so is the risk of hitting the capital protection. Hence as mentioned, the worst case scenarios are calculated before setting the multiplier. In practice, multipliers are in the range of 3-5. The exposure to risky asset needs to be rebalanced to ensure that capital protection does not take a hit.

Due to the constant reference to the given floor, to reset a pre-defined proportion between risky and riskless assets, this strategy is called Constant Proportion Portfolio Insurance. The name CPPI comes from this constantly preserved definition of how much would be invested in equity and how much in cash.

Example:

Rs.100 is the current portfolio value and is also the desired level of capital to be protected; Rs.90 is its present value (floor); Therefore the cushion is (100 – 90) = Rs. 10. 'm' (Leverage) is 5 times which is decided by the fund manager or investor. These parameters are set in advance; Then the Investment in equity/risky assets is Rs.(100 -90)*5 =Rs. 50;
Investment in risk free asset was Rs.100 - Rs.50 = Rs.50.

Chapter 21: Sample Questions

1. The need for rebalancing arises due to _____.

   a. changes in market conditions impacting assets' risk return forecasts
   b. the circumstances of the investors
   c. Both a & b
   d. portfolios auto rebalance

2. _____ is the process of aligning portfolio weights to the strategic asset allocation. It is an important step in portfolio management process
   a. Optimization
   b. Evaluation
   c. Performance measurement
   d. Rebalancing

3. Which of the following statement is not True?
   a. Different assets involve different costs of transactions.
   b. international equity has higher transaction costs than domestic equity.
   c. listed equity pose more complications in rebalancing than Illiquid assets like private equity, or direct real estate
   d. None of the above

4. Under the following rebalancing strategy, the portfolio value becomes a function of the performance of risky assets and there would be no limit on the upside potential of the portfolio.
   a. Buy and hold
   b. CPPI
   c. Constant mix
   d. All the above

5. If the portfolio value is Rs. 150 cr, the floor value is Rs. 100 cr, the multiplier is 3, then the exposure to risky assets would be:
   a. Rs. 150 cr
   b. Rs.100 cr
   c. Rs. 50 cr
   d. Rs. 75 cr

6. An investor deposits Rs.200 lakhs today with a fund manager for a period of 5 years and gives a mandate that at any cost there should not be any erosion of this initial wealth by the end of 5 years. If the current risk free rate of return is 8%, what amounts can be invested by

the fund manager in the risk free and risky assets, if the organisation, limits the leverage multiplier to a maximum of 2?

a) Rs.72.22 lakhs and Rs.127.78 lakhs
b) Rs.127.78 lakhs and Rs. 72.22 lakhs
c) Rs.63.89 lakhs and Rs. 136.11 lakhs
d) Rs.136.11 lakhs and Rs. 63.89 lakhs

Answer: a) Rs.72.22 lakhs and Rs.127.78 lakhs
Explanation: The Present Value of Rs.200 lakhs @ 8% for 5 years = (200/(1.08^5) = 136.11. Therefore the manager can invest upto (200 - 136.11) * 2 in the risky asset = Rs.127.78 lakhs and the balance Rs.72.22 lakhs in the risk free asset

7. A PMS manager receives Rs. 50 lakhs from a mutual benefit society to be invested in a portfolio of equity shares. Leaving Rs.5 lakhs in cash to encash opportune moments in the markets, the manager invests the rest in equal proportions in three equity shares K, L and M, each of which was, bought at Rs.500, Rs.1000, and Rs.750 respectively. The manager would like to maintain the constant proportions strategy while rebalancing the portfolio at regular intervals. What action should the manager take when the prices of the three equity shares change to Rs.600, Rs.900, Rs.1200, (K, L, and M respectively), after 1 year?

a) Buy K and L shares by Selling M
b) Buy M and by Selling K and L shares
c) Buy M and L shares by Selling K
d) Sell K and L shares and buy M

Answer: a) Buy K and L shares by Selling M
Explanation: Arrive at the number of shares purchased at the beginning, Rs.15 lakhs allocated to each of the shares. Later identify the values of investment in each of the share and then bring back the investments to equal proportions at the new increased total portfolio value.

8. A PMS manager receives Rs. 50 lakhs from a mutual benefit society to be invested in a portfolio of equity shares. Leaving Rs.5 lakhs in cash to encash opportune moments in the markets, the manager invests the rest in equal proportions in three equity shares K, L and M, each of which was bought at Rs.500, Rs.1000, and Rs.750 respectively. The manager would like to maintain the constant proportions strategy while rebalancing the portfolio at regular intervals. What is the action prescribed w.r.t. equity share L. Roundup the number of equity shares?

a) Buy 556 shares
b) Buy 459 shares
c) Sell 556 shares
d) Sell 459 shares

Answer: a) Buy 556 shares

Explanation: Arrive at the number of shares purchased at the beginning, Rs.15 lakhs allocated to each of the shares. Later identify the values of investment in each of the share and then bring back the investments to equal proportions at the new increased total portfolio value. After that calculate the difference between the current value and desired value to find out how many shares need to be bought or sold at current price.

Annexure : Z-Table

Standard Normal Probabilities

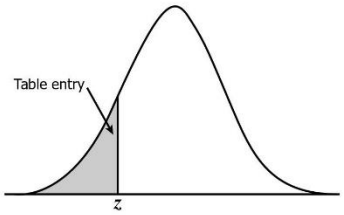


Table entry for z is the area under the standard normal curve to the left of z.

z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
−3.4	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0002
−3.3	.0005	.0005	.0005	.0004	.0004	.0004	.0004	.0004	.0004	.0003
−3.2	.0007	.0007	.0006	.0006	.0006	.0006	.0006	.0005	.0005	.0005
−3.1	.0010	.0009	.0009	.0009	.0008	.0008	.0008	.0008	.0007	.0007
−3.0	.0013	.0013	.0013	.0012	.0012	.0011	.0011	.0011	.0010	.0010
−2.9	.0019	.0018	.0018	.0017	.0016	.0016	.0015	.0015	.0014	.0014
−2.8	.0026	.0025	.0024	.0023	.0023	.0022	.0021	.0021	.0020	.0019
−2.7	.0035	.0034	.0033	.0032	.0031	.0030	.0029	.0028	.0027	.0026
−2.6	.0047	.0045	.0044	.0043	.0041	.0040	.0039	.0038	.0037	.0036
−2.5	.0062	.0060	.0059	.0057	.0055	.0054	.0052	.0051	.0049	.0048
−2.4	.0082	.0080	.0078	.0075	.0073	.0071	.0069	.0068	.0066	.0064
−2.3	.0107	.0104	.0102	.0099	.0096	.0094	.0091	.0089	.0087	.0084
−2.2	.0139	.0136	.0132	.0129	.0125	.0122	.0119	.0116	.0113	.0110
−2.1	.0179	.0174	.0170	.0166	.0162	.0158	.0154	.0150	.0146	.0143
−2.0	.0228	.0222	.0217	.0212	.0207	.0202	.0197	.0192	.0188	.0183
−1.9	.0287	.0281	.0274	.0268	.0262	.0256	.0250	.0244	.0239	.0233
−1.8	.0359	.0351	.0344	.0336	.0329	.0322	.0314	.0307	.0301	.0294
−1.7	.0446	.0436	.0427	.0418	.0409	.0401	.0392	.0384	.0375	.0367
−1.6	.0548	.0537	.0526	.0516	.0505	.0495	.0485	.0475	.0465	.0455
−1.5	.0668	.0655	.0643	.0630	.0618	.0606	.0594	.0582	.0571	.0559
−1.4	.0808	.0793	.0778	.0764	.0749	.0735	.0721	.0708	.0694	.0681
−1.3	.0968	.0951	.0934	.0918	.0901	.0885	.0869	.0853	.0838	.0823
−1.2	.1151	.1131	.1112	.1093	.1075	.1056	.1038	.1020	.1003	.0985
−1.1	.1357	.1335	.1314	.1292	.1271	.1251	.1230	.1210	.1190	.1170
−1.0	.1587	.1562	.1539	.1515	.1492	.1469	.1446	.1423	.1401	.1379
−0.9	.1841	.1814	.1788	.1762	.1736	.1711	.1685	.1660	.1635	.1611
−0.8	.2119	.2090	.2061	.2033	.2005	.1977	.1949	.1922	.1894	.1867
−0.7	.2420	.2389	.2358	.2327	.2296	.2266	.2236	.2206	.2177	.2148
−0.6	.2743	.2709	.2676	.2643	.2611	.2578	.2546	.2514	.2483	.2451
−0.5	.3085	.3050	.3015	.2981	.2946	.2912	.2877	.2843	.2810	.2776
−0.4	.3446	.3409	.3372	.3336	.3300	.3264	.3228	.3192	.3156	.3121
−0.3	.3821	.3783	.3745	.3707	.3669	.3632	.3594	.3557	.3520	.3483
−0.2	.4207	.4168	.4129	.4090	.4052	.4013	.3974	.3936	.3897	.3859
−0.1	.4602	.4562	.4522	.4483	.4443	.4404	.4364	.4325	.4286	.4247
−0.0	.5000	.4960	.4920	.4880	.4840	.4801	.4761	.4721	.4681	.4641

Standard Normal Probabilities

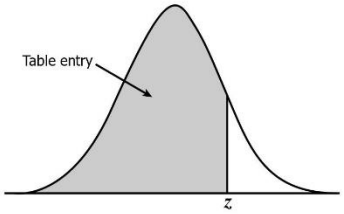
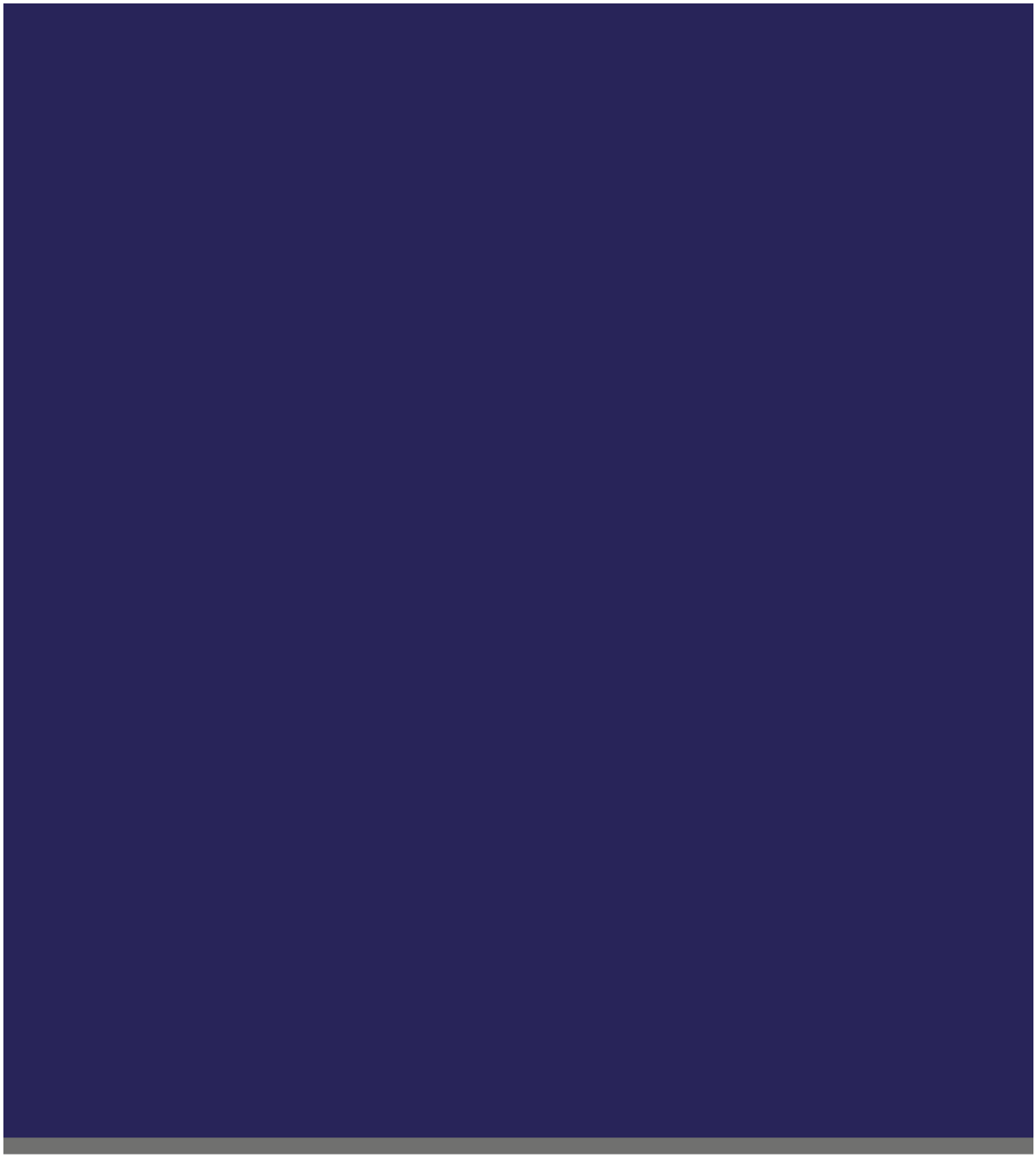


Table entry for z is the area under the standard normal curve to the left of z.

z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
0.0	.5000	.5040	.5080	.5120	.5160	.5199	.5239	.5279	.5319	.5359
0.1	.5398	.5438	.5478	.5517	.5557	.5596	.5636	.5675	.5714	.5753
0.2	.5793	.5832	.5871	.5910	.5948	.5987	.6026	.6064	.6103	.6141
0.3	.6179	.6217	.6255	.6293	.6331	.6368	.6406	.6443	.6480	.6517
0.4	.6554	.6591	.6628	.6664	.6700	.6736	.6772	.6808	.6844	.6879
0.5	.6915	.6950	.6985	.7019	.7054	.7088	.7123	.7157	.7190	.7224
0.6	.7257	.7291	.7324	.7357	.7389	.7422	.7454	.7486	.7517	.7549
0.7	.7580	.7611	.7642	.7673	.7704	.7734	.7764	.7794	.7823	.7852
0.8	.7881	.7910	.7939	.7967	.7995	.8023	.8051	.8078	.8106	.8133
0.9	.8159	.8186	.8212	.8238	.8264	.8289	.8315	.8340	.8365	.8389
1.0	.8413	.8438	.8461	.8485	.8508	.8531	.8554	.8577	.8599	.8621
1.1	.8643	.8665	.8686	.8708	.8729	.8749	.8770	.8790	.8810	.8830
1.2	.8849	.8869	.8888	.8907	.8925	.8944	.8962	.8980	.8997	.9015
1.3	.9032	.9049	.9066	.9082	.9099	.9115	.9131	.9147	.9162	.9177
1.4	.9192	.9207	.9222	.9236	.9251	.9265	.9279	.9292	.9306	.9319
1.5	.9332	.9345	.9357	.9370	.9382	.9394	.9406	.9418	.9429	.9441
1.6	.9452	.9463	.9474	.9484	.9495	.9505	.9515	.9525	.9535	.9545
1.7	.9554	.9564	.9573	.9582	.9591	.9599	.9608	.9616	.9625	.9633
1.8	.9641	.9649	.9656	.9664	.9671	.9678	.9686	.9693	.9699	.9706
1.9	.9713	.9719	.9726	.9732	.9738	.9744	.9750	.9756	.9761	.9767
2.0	.9772	.9778	.9783	.9788	.9793	.9798	.9803	.9808	.9812	.9817
2.1	.9821	.9826	.9830	.9834	.9838	.9842	.9846	.9850	.9854	.9857
2.2	.9861	.9864	.9868	.9871	.9875	.9878	.9881	.9884	.9887	.9890
2.3	.9893	.9896	.9898	.9901	.9904	.9906	.9909	.9911	.9913	.9916
2.4	.9918	.9920	.9922	.9925	.9927	.9929	.9931	.9932	.9934	.9936
2.5	.9938	.9940	.9941	.9943	.9945	.9946	.9948	.9949	.9951	.9952
2.6	.9953	.9955	.9956	.9957	.9959	.9960	.9961	.9962	.9963	.9964
2.7	.9965	.9966	.9967	.9968	.9969	.9970	.9971	.9972	.9973	.9974
2.8	.9974	.9975	.9976	.9977	.9977	.9978	.9979	.9979	.9980	.9981
2.9	.9981	.9982	.9982	.9983	.9984	.9984	.9985	.9985	.9986	.9986
3.0	.9987	.9987	.9987	.9988	.9988	.9989	.9989	.9989	.9990	.9990
3.1	.9990	.9991	.9991	.9991	.9992	.9992	.9992	.9992	.9993	.9993
3.2	.9993	.9993	.9994	.9994	.9994	.9994	.9994	.9995	.9995	.9995
3.3	.9995	.9995	.9995	.9996	.9996	.9996	.9996	.9996	.9996	.9997
3.4	.9997	.9997	.9997	.9997	.9997	.9997	.9997	.9997	.9997	.9998

Important

- Please note that the Test Centre workstations are equipped with either Microsoft Excel or OpenOffice Calc. Therefore, candidates are advised to be well versed with both of these softwares for computation of numericals.
- The sample caselets and multiple choice questions illustrated in the book are for reference purposes only. The level of difficulty may vary in the actual examination.



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