



**MASTER IN
MANAGEMENT STUDIES
SEMESTER - III (CBCS)**

**SECURITY ANALYSIS
AND PORTFOLIO
MANAGEMENT**

SUBJECT CODE : UMMSIII.7.3

Prof.(Dr.) D. T. Shirke
Offg. Vice-Chancellor,
University of Mumbai,

Prin. Dr. Ajay Bhamare
Offg. Pro Vice-Chancellor,
University of Mumbai,

Prof. Prakash Mahanwar
Director,
IDOL, University of Mumbai,

Program Co-ordinator : Ms. Rajashree Pandit
Assistant Professor (Economics),
Head Faculty of Commerce & Management,
IDOL, University of Mumbai, Mumbai.

Course Co-ordinator : Mr. Nilesh N. Manore
& Editor
Co-ordinator M.M.S (Finance), IDOL,
University of Mumbai, Mumbai

Course Writers : Dr. Tushar Balkrishna Raut
Assistant Professor
St. Gonsalo Garcia College of Arts &
Commerce, Vasai (West)

May 2023, Print 1

Published by : Director Incharge
Institute of Distance and Open Learning ,
University of Mumbai,
Vidyanagari, Mumbai - 400 098.

DTP Composed : Mumbai University Press
Printed by Vidyanagari, Santacruz (E), Mumbai

CONTENTS

Unit No.	Title	Page No.
1.	Introduction to Securities	1
2.	Securities - Risk and Return Analysis	08
3.	Efficient Market Hypothesis	24
4.	Equity Research and Valuation	31
5.	Fixed Income Security Analysis	38
6.	Indexing and Benchmarking	45
7.	Technical Analysis	51
8.	Capital Market Theories	64
9.	Factor Models and Arbitrage Pricing Theory	74
10.	Investment Decision Theory	81
11.	Portfolio Theory	86



Semester	:	III-Core			
Title of the Subject / course	:	Security Analysis and Portfolio Management			
Course Code	:				
Credits	:	4	Duration	:	40

Learning Objective

1	To understand the factors affecting the prices of different assets and to create an optimum portfolio based on given risk conditions.
2	To understand the need for continuous evaluation and review of the portfolio with different techniques.
3	To learn technical analysis to predict price movements based on indicators and forecasting techniques.

Prerequisites if any	This subject requires basic knowledge of Financial management, financial markets and institutions.
Connections with Subjects in the current or Future courses	Investment banking, Corporate valuation.

Sr. No.	Content	Activity	Learning outcomes
1	Introduction to securities	Lecture and classroom discussion	Understanding the basics of securities
2	Securities - Risk and return analysis Types of securities, probability v/s absolute loss in risk management, volatility in prices, statistical tools for risk calculation.	Lecture and exercises	Understand the risk return analysis
3	Efficient Market Hypothesis Random walk theory, significance, usage.	Lecture and exercises	Ability to calculate prices using EMH
4	Equity research and valuation Sources of financial information, industry analysis, company analysis, valuation of equity shares.	Lecture and problem solving	Ability to carry on company analysis and valuation of equity shares
6	Fixed income security analysis Systematic and unsystematic risk, warrants and convertibles, bond valuation		Understand the fixed income securities
7	Indexing and Benchmarking Creation of an index, adjusting for corporate adjustments in the index, tracking an index.	Lecture and problem solving	Ability of creating and tracking index

Sr. No.	Content	Activity	Learning outcomes
8	Technical analysis Dow theory, types of charts. Japanese candle stick patterns, chart patterns, technical indicators.	Lecture and problem solving	Ability to carry on technical analysis
9	Capital market theories Capital asset pricing model, portfolio risk and return.	Lecture	Ability to apply capital market theories
10	Factor models and arbitrage pricing theory Factor based valuation models, Risk free arbitrage.	Classroom discussion	Understanding and applying factor models and APT
11	Investment decision theory Timing, allocation, buy, hold, sell, short.	Problem solving	Understanding and applying investment decision theory
12	Portfolio theory Construction and analysis, portfolio optimization, portfolio management strategies, portfolio performance measurement.	Classroom discussion	Understanding and applying portfolio theory

Text Books

1	Prasanna Chandra , Security Analysis and Portfolio Management.
2	Donald E Fischer, Roland J Jordan, Security Analysis and Portfolio Management.

Reference Books

1	Steven Achelis , Technical Analysis.
2	John Murphy , Technical Analysis of Financial Markets.

Assessment

Internal	40%
Semester-end	60%

INTRODUCTION TO SECURITIES

Unit Structure

- 1.0 Objectives
- 1.1 Introduction
- 1.2 Meaning of securities
- 1.3 Characteristics and Structure of Securities Market
- 1.4 Capital Market
- 1.5 New Issue Market
- 1.6 Dematerialization
- 1.7 Summary
- 1.8 Unit End Questions
- 1.9 Suggested Readings

1.0 OBJECTIVES

The main purpose of this chapter is—

- To explain the meaning of securities
- To understand the characteristics and structure of Securities
- To discuss the various types of Securities
- To explain Capital Market
- To describe New Issue Market
- To understand Dematerialization

1.1 INTRODUCTION

In every economic system, some organisations or individuals can produce surpluses while others can produce deficits. Units that produce surpluses are known as savers, whereas those that produce deficits are known as spenders. At the spectral level, homes in our nation are surplus-producing when businesses and the government are running deficits. However, this is only accurate on an overall scale. You will undoubtedly come across both business entities that generate surpluses and individual families that generate deficits.

What the surplus-generating units do with their surpluses or saves is the question that emerges in this situation. As you can see, they only have two options available to them. They have the option of investing their savings

or keeping them as cash on hand. For transactional, preventative, or speculative requirements, liquid cash must be held. The units that produce excess could make investments in a variety of ways. They might invest in tangible assets like land, buildings, machinery, and precious metals like gold and silver. They may also invest in financial assets like shares and debentures, Unit Trade India units, treasury bills, commercial paper, and other types of paper.

A capital market is a place where governments and commercial businesses (companies) can raise long-term capital and trade securities (both debt and equity). It is described as a market where money is lent for periods longer than a year because other markets are used to raise short-term capital (e.g., the money market).

1.2 MEANING OF SECURITIES

Any financial asset that can be traded is considered to be a security. The characteristics of what can and cannot be classified as securities typically depend on the legal system of the country where the assets are exchanged.

The exchange markets are where securities are traded. The legal definitions of the term, which primarily classify equities and fixed income as securities, differ from the common understanding that it applies to all sorts of financial instruments.

However, securities can also be notes, swaps, warrants, mutual funds, interest-bearing Treasury bills, and debentures. Additionally, participation in oil drilling initiatives is regarded as a security. The issuer of the security is the legal entity that issues the security.

The degree of inherent risk in various securities varies. For instance, while some stocks are riskier than others, overall stocks are thought to be riskier than bonds. An investor chooses the appropriate securities in accordance with the level of risk he wishes to accept. Furthermore, the degree of liquidity varies among securities. Because investors can enhance the price of these assets by purchasing additional securities and obtaining a better return on investment, highly liquid securities including bonds, stocks, and money market instruments are traded more often.

Definition: Securities are negotiable financial instruments issued by a company or government that give ownership rights, debt rights, or rights to buy, sell, or trade an option.

1.3 CHARACTERISTICS AND STRUCTURE OF SECURITIES MARKET

- The terms of the exchange of money between two parties—in this case, the buyer and the seller—are expressed by securities.
- Borrowers and equity funders can issue securities to raise funds at a fair price and grant investors ownership of the securities.

- Businesses use a regulated contract and a controlled and supervised method to issue securities to investors with excess capital to raise money.
- Investors have a right to the rights represented by the securities, even though the terms of the capital raise are determined by the security's issuer.
- Securities can be broadly divided into two categories: debt and equity (risk participation) (claim on cash flows).
- Equity securities are issued forever, whereas debt securities are issued for a specified time period. While equity pays dividends, it is not guaranteed, debt securities pay interest.

Structure of Securities Market

- The term "primary market" describes the area of the market where corporations issue securities as either a new issue or an offer for sale. Both equities and debt securities have an initial public offering (IPO) market.
- The secondary markets are where these securities are really traded. Eventually, primary debt and equity issues are traded in the secondary market to determine prices. The primary trading market is the secondary market.
- Futures and options are traded in the derivatives market. Derivatives, which are only contracts and are used to control the risk inherent in the security, contrast equities, which denote ownership. Derivative contracts are a trading option for traders.

1.4 CAPITAL MARKET

The capital market refers to the marketplace where investment funds like bonds, shares, and mortgages are traded. The capital market's primary function is to direct investments from investors with surplus funds to those who are experiencing a shortfall. The capital market provides both overnight and long-term funds. The market for securities known as the capital market is where businesses and governments can raise long-term financing. It is a market where loans for terms greater than a year are made.

Equity instruments, credit market instruments, insurance instruments, foreign currency instruments, hybrid instruments, and derivative instruments are only a few of the capital market instruments utilised for market trade. In order to profit from their respective markets, investors use these.

All of these are referred to be capital market instruments because they generate money for businesses, corporations, and occasionally national governments.

Because long-term funds are raised through trading on debt and equity securities, this market is often referred to as the securities market. Both businesses and governments may carry out these actions.

The primary market and secondary market make up the capital market. Newly issued bonds and stocks are traded in the primary market, and existing bonds and stocks are bought and sold in the secondary market.

Bond market and stock market are two common categories of the capital market.

Bond Market offers finance through the issue and trading of bonds.

- By issuing shares or stock and through share trading, the stock market offers financing.
- Capital Market as a whole makes it easier to raise money by exchanging long-term financial assets.

1.5 NEW ISSUE MARKET

The primary capital market is another name for the New Issue Market, or NIM. In this market, newly-introduced securities are offered for sale to the general public for the first time. As the money obtained from this market offers long-term funding, it is often referred to as the "long-term debt market."

Business entities may raise money in the primary market through a private placement, rights issue, or initial public offering. Selling securities to the general public on the primary market is known as an initial public offering (IPO). This initial public offering may be conducted using either the book-building method, the fixed price method, or both methods combined.

According to SEBI standards, an issuer company may opt to issue securities in the following ways if the issuer chooses to go the book-building path to do so:

1. The entire net offer made to the general public via the book-building method
2. Through the book-building process and 25% of the fixed price portion, the public will receive 75% of the net offer.

The new issue market and stock exchange make up India's industrial securities markets. The new issue market deals with new securities that have never before been offered to the investing public, or securities that are issued for the first time. As a result, the market makes a fresh block of securities available for public subscription. In other words, the new issue market is concerned with how corporations raise new capital for cash or for something other than cash.

The market for new issues includes every institution engaged in handling new claims. These claims are made in the forms of equity shares, preference shares, debentures, rights issues, deposits, etc. The new issue markets include all financial institutions that contribute, underwrite, and directly subscribe to the securities.

1.6 DEMATERIALIZATION

The technique of dematerialization allows a client to turn their physical certificates into electronic balances. An investor must have an account with a DP if they plan to dematerialize their securities. The client is required to deface and turn over to the DP any certificates registered in its name. After electronically notifying NSDL, the DP transmits the securities to the relevant Issuer/R&T agent.

The market microstructure of Indian stock exchanges has evolved significantly as a result of dematerialized securities trading, settlement, and custody. An investor would typically choose a stock with greater liquidity to one with less. Lower transaction costs and simpler entrance and exit options are associated with more liquidity. Higher liquidity is therefore preferable. Ownership transfers for demat shares happen relatively rapidly. The ability of investors to frequently churn their portfolios would improve turnover and liquidity.

Physical (paper) shares are unquestionably inferior to dematerialized shares. Problems with counterfeit, forgeries, theft, and duplication plague physical shares. According to logic, there should be more demand for demat shares, which is anticipated to drive up (and, to a lesser extent, drive down) share prices and produce larger profits (and, conversely, less loss) for investors compared to the predemat time. This increased demand will remain for a while (the adjustment period may last for a few months) only.

1.7 SUMMARY

- A capital market is a place where governments and commercial businesses (companies) can raise long-term capital and trade securities (both debt and equity).
- Debt securities, such as bonds and certificates of deposit, typically require the holder to pay periodical interest payments, the principal amount owed, as well as any other contractual obligations that may be specified.
- Equity instruments, credit market instruments, insurance instruments, foreign currency instruments, hybrid instruments, and derivative instruments are only a few of the capital market instruments utilised for market trade.
- The institutions that trade in new claims are all included in the new issue market.

- Equity shares, preference shares, debentures, rights issues, deposits, etc. are the forms in which these claims are generated.
- The new issue markets include all financial institutions that contribute, underwrite, and directly subscribe to the securities.
- Physical (paper) shares are unquestionably inferior to dematerialized shares. Problems with counterfeit, forgeries, theft, and duplication plague physical shares.

1.8 UNIT END QUESTIONS

A. Descriptive Questions:

1. What do you mean by securities?
2. Explain the characteristics of Securities market.
3. Write note on structure of securities market.
4. What is dematerialisation?
5. What are the types of derivatives securities?

B. Fill in the blanks:

1. The refers to the marketplace where investment funds like bonds, shares, and mortgages are traded.
2. The primary capital market is another name for the.....
3. The new issue market and stock exchange make up industrial securities markets.
4. allows a client to turn their physical certificates into electronic balances.

Answer:

1. capital market
2. New Issue Market
3. India's
4. Dematerialization

1.9 SUGGESTED READINGS

- Graham, Benjamin, David, L., Dodd, Sidney Cottle, et al., Security Analysis: Principles and Techniques, 4th ed., New York McGraw – Hill Book Co. Inc., 1962.
- Granger, Clive W and Morgenstem Oskar, Predictability of Stock Market Prices, Lexington, Health Lexington, 1970.

- Granville, Joseph E., A Strategy of Daily Timings for Maximum Profit, Englewood Cliffs, N.J., Prentice-Hall, 1960.
- Gup, Benton E., Basics of Investing, N.Y. Wiley, 1979.
- Gupta L.C., Rates of Return on Equities: The Indian Experience, Bombay, Oxford University Press, 1981.
- Sudhindra Bhat, Security Analysis and Portfolio Management, Excel Book



SECURITIES - RISK AND RETURN ANALYSIS

Unit Structure

- 2.0 Objectives
- 2.1 Introduction
- 2.2 Types of Securities
- 2.3 Probability V/s Absolute loss in risk management
- 2.4 Volatility in price
- 2.5 Statistical tools for risk calculation
- 2.6 Types of Risk
- 2.7 Risk and Expected Return
- 2.8 Risk-Return Relationship
- 2.9 Summary
- 2.10 Unit End Questions
- 2.11 Suggested Readings

2.0 OBJECTIVES

The main purpose of this chapter is—

- To understand the types of securities
- To explain Probability V/s Absolute loss in risk management
- To explain volatility in price
- To understand Statistical tools for risk calculation
- To discuss types of risk
- To understand the concept of risk & expected Return
- To analyse risk return relationship

2.1 INTRODUCTION

Investing is a hybrid of an art and a science, unlike natural science and like medicine, law, and economics. There are some aspects of investing that are best approached scientifically. The development of computer skills has sped up the application of scientific approaches. However, as businesses are run by individuals, they are susceptible to issues brought on by their poor judgement. The corporations also operate in a highly competitive and dynamic environment, and many of them do so on a national and international scale. The judgement aspect still predominates in investment decisions as a result. Although it is doubtful that investing

will ever be considered a science, study, education, and experience have turned investment into a discipline. A disciplined, reliable, and organised procedure without rigidity in either thought or approach is what is meant by discipline.

Financial Analysis

The informational and predicative component of investing is financial analysis. It offers data on the past, present, and future while also quantifying expectations. Financial analysis is used to make decisions on corporate financial policies, capital budgeting, and the wise choice of assets to invest in. Economic, capital market, sector, and specialised security evaluations are some of the analytical tools that have been utilised for these objectives.

Economic Analysis

In terms of the country's output of goods and services, inflation, profitability, monetary and fiscal policy, and productivity, economic analysis provides both short- and long-term estimates for the entire economy. As a result, it serves as the basis for financial market, industry, sector, and firm projections of the future.

Capital Market Analysis

In order to determine the value and return expectations for securities and to distinguish between overpriced and underpriced securities, capital market analysis looks at the industries and securities of specific companies.

Sector analysis sits between capital market analysis and security analysis, combining elements of both. Sector analysis, which is more comprehensive than business and industry analysis, can be seen as a link between the capital market setting and key stock groupings that either cross or combine numerous industries (e.g., according to economic sector, growth rate, or earnings cycles).

Comparative Selection of Securities

It is necessary to appraise securities before choosing among different investment options so that their relative attractiveness in terms of return and risk may be assessed at any moment. Only consistent analytical techniques may be used to achieve this goal, and industry and business forecasts must be based on internally consistent sets of economic and capital market estimates.

Since consistency and comparability are crucial, they ought to serve as the process' dual objectives for investment analysis. While comparability looks for accurate data on firms for each time period, consistency applies to data for a single company over time. The investor cannot use solid judgement to spot instances of overvaluation and undervaluation without consistency and comparability.

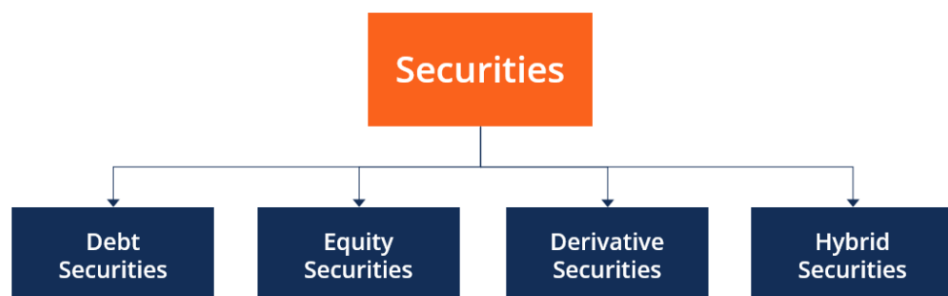
Making Investment Decisions The best way to understand how investment decisions are made is as an integrated process to which security analysis uniquely contributes. The definition of objectives and the evaluation of success in portfolio management call for the consistent use of economic, capital market, and sector analyses. By highlighting the securities that are either fairly priced or underpriced and most likely to deliver the desired results, security analysis aids investment decision-makers.

The following goals serve as the foundation for developing investment policies and asset allocation strategies:

1. To continuously preserve the purchasing power of its assets, adjusted for inflation, and to generate a satisfactory "real" rate of return.
2. To minimise portfolio risk and volatility while maintaining sufficient spending stability from year to year.

2.2 TYPES OF SECURITIES

Debt securities, equity securities, derivative securities, and hybrid securities—a mix of debt and equity—are the four primary types of security.



Debt Securities

Debt securities, also known as fixed-income securities, are a representation of borrowed money that needs to be repaid, with terms defining the sum borrowed, the interest rate, and the maturity date. In other words, debt securities are financial instruments that can be traded between parties, such as bonds (such as government or municipal bonds) or certificates of deposit (CDs).

Debt securities, such as bonds and certificates of deposit, typically require the holder to pay periodical interest payments, the principal amount owed, as well as any other contractual obligations that may be specified. These securities are typically sold for a set period of time before being redeemed by the issuer.

Based on a borrower's credit history, track record, and solvency—the capacity to repay the loan in the future—the interest rate on a debt security is decided. In order to make up for the amount of risk taken, a lender

would need to charge a higher interest rate the larger the possibility that the borrower would default on the loan.

It is vital to note that the daily dollar volume of trading in debt securities is substantially higher than that in stocks. The rationale is that institutional investors, together with governments and not-for-profit organisations, own the majority of debt securities.

Equity Securities

Shareholders' ownership interest in a company is represented by equity securities. To put it another way, becoming a shareholder of an organisation requires making an investment in its equity capital.

Holders of equity securities are not entitled to a regular payment, but they can make capital gains by selling their stocks, which is how they vary from holders of debt securities. Another distinction is that equity securities give the holder ownership rights, making him a shareholder with a stake corresponding to the number of bought shares.

If a company files for bankruptcy, the equity holders can only split the interest that is left over after all obligations have been met by the holders of debt security. Companies regularly pay dividends to shareholders who share in the earned profits from their main company operations, but debt holders do not get dividend payments.

Derivative Securities

Financial instruments known as derivative securities have a value based on fundamental factors. Assets like stocks, bonds, currencies, interest rates, market indexes, and goods are examples of variables. Utilizing derivatives is primarily done to weigh risks and reduce them. It is accomplished through gaining access to difficult-to-reach assets or markets, providing favourable conditions for speculation, and providing insurance against price fluctuations.

In the past, derivatives were employed to guarantee stable currency rates for items that were transacted abroad. International traders required an accounting system to fix the exchange rates of their various national currencies.

Four primary categories of derivative securities exist:

1. Futures

Futures, often known as futures contracts, are agreements between two parties to buy and deliver an item at a predetermined price at a later period. Futures are exchanged on an exchange with standardised contracts. The parties engaged in a futures transaction must acquire or sell the underlying asset.

2. Forward

Although forwards, or forward contracts, are comparable to futures, they are exclusively traded in retail settings. The terms, amount, and method of settlement for the derivative must be agreed upon by the buyer and seller before the formation of a forward contract.

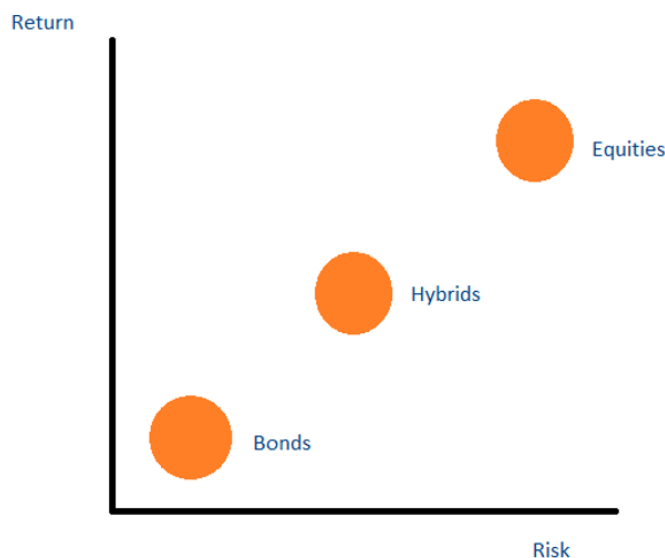
The risk incurred by both sellers and buyers is another distinction from futures. When one party declares bankruptcy, there is a chance that the other party won't be able to defend its rights, which could reduce the value of its position.

3. Options

Options, or options contracts, are comparable to futures contracts in that they involve the purchase or selling of an asset between two parties at a defined price at a future date. The main distinction between the two types of contracts is that, in the case of an option, the buyer is not obligated to carry out the action of purchasing or selling.

4. Swaps

In a swap, one type of cash flow is exchanged for another. For instance, a trader can change from a fixed interest rate loan to a variable interest rate loan or vice versa via an interest rate swap.



Hybrid Securities

As the name implies, a hybrid security is a kind of security that combines features of both debt and equity securities. Hybrid securities are frequently used by banks and other organisations to raise capital from investors.

Similar to bonds, they often make a greater interest payment promise at a set or variable rate until a specific future date. The frequency and timing of interest payments are not guaranteed, unlike with bonds. Even better, an investment may be withdrawn at any time or converted into shares.

Preferred stocks, which enable the holder to receive dividends before the holders of common stock, convertible bonds, which, depending on the conditions of the contract, can be converted into a known quantity of equity stocks during the life of the bond or at maturity, are examples of hybrid securities.

Hybrid securities are intricate goods. Even seasoned investors may find it challenging to comprehend and assess the risks associated with trading them. When purchasing hybrid securities, institutional investors can have trouble comprehending the terms of the agreement they enter into.

2.3 PROBABILITY V/S ABSOLUTE LOSS IN RISK MANAGEMENT

Probability and absolute loss are two distinct concepts that are used in risk management to evaluate and manage risks. Absolute loss is the amount of loss that would occur if an event were to occur, whereas probability is the possibility that an event will occur.

Probability, which is frequently used to measure the degree of risk associated with a specific event or scenario, is a significant aspect in estimating the chance of a risk occurring. Probabilities are frequently expressed in risk management as percentages or decimal values between 0 and 1, where a higher probability denotes a higher likelihood of the event occurring.

On the other hand, absolute loss is a measurement of the real financial or other loss that would come from the occurrence of the event. This is crucial for risk management because it makes it easier to estimate a risk's possible effects and choose the right amount of risk transfer or mitigation.

Probability and absolute loss are both significant elements of risk management, and it is frequently necessary to take both into account when choosing risk management tactics. For instance, a risk management strategy may need to be different for a high-probability event with a low absolute loss than for a low-probability event with a large absolute loss.

2.4 VOLATILITY IN PRICE

Price volatility is the degree of change in a financial asset's price over time. It is a gauge of how much an asset's price swings, and it is often computed using statistical concepts like variance or standard deviation.

A variety of causes, such as movements in supply and demand, economic or political events, adjustments to interest rates or inflation, and changes in investor or market mood, can all contribute to volatility. When these elements alter, the price of an asset may quickly fluctuate, increasing volatility.

Volatility for investors can present both a risk and a possibility. On the one hand, if an investor is holding an asset that undergoes a sharp price decrease, extreme volatility can result in huge losses. On the other side,

extreme volatility can also present opportunities for profit if a trader can purchase a security at a discount and then sell it at a premium after the market stabilises.

2.5 STATISTICAL TOOLS FOR RISK CALCULATION

Statistical tools are widely used in risk management to calculate and analyze risk. Here are some common statistical tools for risk calculation:

- **Probability distribution:** Probability distribution is a mathematical function that describes the likelihood of different outcomes in a random event. It is often used in risk management to model the probability of different scenarios, such as the probability of a financial loss occurring.
- **Correlation analysis:** Correlation analysis is used to measure the strength of the relationship between two variables. In risk management, correlation analysis can be used to assess the relationship between different assets or between an asset and a market index.
- **Monte Carlo simulation:** Monte Carlo simulation is a statistical method that uses random sampling to generate possible outcomes for a given set of variables. It is often used in risk management to model the potential outcomes of different scenarios and assess the likelihood of different risks.
- **Sensitivity analysis:** Sensitivity analysis is used to measure how changes in one variable can impact the outcome of a model or simulation. In risk management, sensitivity analysis can be used to assess the impact of different scenarios on a portfolio or investment strategy.
- **Value at Risk (VaR):** Value at Risk is a statistical measure used to estimate the potential loss that could be incurred from an investment or portfolio over a certain time period with a given level of confidence. It is often used in risk management to assess the potential downside risk of a portfolio or investment strategy.

Risk is the likelihood that the anticipated return from the security will not occur. Every investment entails risks that increase the riskiness of future investment returns. Political, economic, and industry considerations could all be contributing contributors to uncertainty.

Future risk may be systematic, depending on its source. Unsystematic risk pertains to a particular industry or company, whereas systematic risk affects the market as a whole. The first three risk variables listed below are organised in a systematic fashion, whereas the remainder are not. Depending on whether it affects the market as a whole or simply one industry, political risk can be categorised.



Risk in finance is the likelihood that the results will be different from what is anticipated. The volatility of returns is the definition of risk in the Capital Asset Pricing Model (CAPM). According to the "risk and return" theory, investments in riskier assets should generate higher projected returns to make up for the higher volatility and greater risk.

Systematic versus Non-systematic Risk

Traditional sources of risk that affect returns are divided into two categories by modern investment analysis: those that are ubiquitous in nature, like market risk or interest rate risk, and those that are specific to a given security concern, such business or financial risk. As a result, we must take these two types of total risk into account. These words are defined in the discussion that follows. We have systematic risk and non-systematic risk when we divide total risk into its two components, a general (market) component and a specific (issuer) component, which are additive:

Total risk = General risk + Specific risk

= Market risk + Issuer risk

= Systematic risk + Non-systematic risk

- **Systematic Risk:**

The diversifiable or non-market portion of the overall risk can be eliminated by an investor by creating a diversified portfolio. The market risk, or non-diversifiable element, is what is left. Systematic (market) risk is the term for variation in a security's total returns that is directly related to broad trends in the market or economy.

Because systematic risk directly includes interest rate, market, and inflation concerns, practically all financial instruments, including bonds and equities, carry some degree of systematic risk. No matter how well the investor diversifies, the risk of the whole market cannot be avoided, hence the investor cannot escape this portion of the risk. Most stocks will suffer if the stock market falls quickly, and most stocks will gain value if it rises sharply, as it did in the latter several months of 1982. Regardless of what any one investor does, these moves continue to happen. It is obvious that market risk is important to all investors.

- **Non-systematic Risk:**

The variance in a security's total returns that is independent to market performance. The non-systematic (non-market) risk is referred to as notes variability. This risk is specific to a given security and is linked to other risks, including business and financial risk and liquidity risk. Even though all securities have a certain amount of non-systematic risk, it is typically associated with common stocks.

Difference between systematic and non-systematic risk

All assets are affected by broad macro variables, which are the cause of systematic (market) risk. The causes of non-systematic (non-market) risk are specific to a security.

Types of Systematic Risk

1. Market Risk:

Market risk is the variation in a security's returns brought on by changes in the overall market. All securities are subject to market risk, which includes events like recessions, wars, shifts in economic structure, modifications to tax laws, and even shifts in consumer preferences. Systematic risk and market risk are sometimes used interchangeably.

2. Interest Rate Risk:

Interest rate risk is the variation in a security's return brought on by variations in the level of interest rates. Security prices typically move opposite of interest rates when such changes occur, all other circumstances being equal. The valuation of securities is related to the cause of this movement. Bonds are more directly impacted by interest rate risk than are common stocks, and it is a significant risk for all bondholders. Bond prices move the other way from changes in interest rates.

3. Purchasing Power Risk:

Purchasing power risk, commonly referred to as inflation risk, is a factor that impacts all securities. This is the chance that money invested may lose some of its purchasing power. Even if the nominal return is safe, there is risk associated with the real (inflation-adjusted) return when inflation is unclear (e.g., a Treasury bond). This risk is linked to interest rate risk since lenders need to charge higher inflation premiums to cover the loss of buying power, which causes interest rates to typically climb when inflation does.

Types of Unsystematic Risk

1. Regulation Risk:

Because of specific rules or tax laws that provide them a benefit of some sort, some investments may be more alluring than others. For instance, municipal bonds pay interest that is not subject to federal, state, or local taxation. Municipals can price bonds to offer a lower interest rate as a

result of that particular tax exemption because the net after-tax yield may still be appealing to investors. The danger of a regulation change that can have a negative impact on an investment's reputation is significant. Many existing limited partnerships that relied on special tax considerations as part of their overall return were significantly less attractive in 1987 as a result of changes to the tax code. Prices for many limited partnerships fell when investors were left with securities that were, in fact, different from what they had initially expected.

2. Business Risk:

Firm risk refers to the risk associated with operating a business in a specific sector or setting. For instance, U.S. Steel, one of the biggest producers of steel, has particular issues. Similar issues arise for General Motors as a result of recent events like the global energy market and Japanese imports.

3. Reinvestment Risk:

The YTM calculation makes the assumption that the investor will reinvest all bond coupons at a rate that is equal to the bond's computed YTM, generating interest on interest for the duration of the bond at the computed YTM rate. In essence, this computation takes for granted that the yield to maturity is equal to the reinvestment rate.

4. Bull-Bear Market Risk:

This risk results from the fluctuation in market returns brought on by the alternating forces of bull and bear markets. A bull market is a period of time during which a securities index rises steadily after a period of time during which it fell, known as a trough. When the market index reaches its high and begins to trend lower, the bull market is over. A bear market is the period of time when the market falls to its subsequent low point.

5. Management Risk:

All things considered, management is composed of mortal, imperfect, and prone to error, decision-making individuals. Management mistakes can hurt people who invested in their companies. Forecasting errors is a challenging task that may not be worthwhile, which leads to an unnecessarily pessimistic view.

When shareholder owners assign daily decision-making power to managers who are hired employees rather than substantial owners, a connection between agent and principal is created. According to this hypothesis, owners will exert more effort than employees to increase the company's value. According to numerous studies in the area, buying stock in companies where CEOs have substantial equity stakes can help investors cut their losses from hard-to-analyse management errors.

6. Default Risk:

It is that portion of an investment's overall risk that arises from modifications to the investment's financial stability. For instance, changes in the firm's financial integrity will be reflected in the market price of its securities when a corporation that issues securities moves either further away from bankruptcy or closer to it. Default risk is the variation in return that investors encounter as a result of changes in the credit worthiness of a company in which they have invested.

Nearly 80% of the losses experienced by investors due to default risk are not brought on by actual defaults and/or bankruptcies. Investor losses from default risk typically occur from declining security prices due to a corporation's weakening financial standing; by this point, the market price of the ailing firm's securities will have already dropped to close to zero. This isn't always the case, though; "creative" accounting techniques used by companies like Enron, WorldCom, Arthur Anderson, and Computer Associates may keep stock values quoted even when the company's net worth is utterly depleted. Therefore, the total losses brought on by the course of financial degradation would not exceed the bankruptcy losses by much.

7. International Risk:

Country risk and currency rate risk are both examples of international risk. Exchange Rate Risk: In today's more globally interconnected investing environment, all investors who make overseas investments run the risk of receiving uncertain returns when they convert their foreign winnings back to their home currencies. Investors today must be aware of and comprehend exchange rate risk, which may be defined as the variability in returns on securities induced by currency movements. This is in contrast to the past, when the majority of US investors ignored overseas investing choices. Currency risk is another name for exchange rate risk.

8. Country Risk:

Political risk, often known as country risk, is a significant risk for investors today. The political and, consequently, economic stability and sustainability of a country's economy must be taken into consideration as more investors, both directly and indirectly, make direct and indirect investments abroad.

9. Liquidity Risk:

The risk connected with a specific secondary market where a securities trades is called liquidity risk. Liquid investments are those that can be swiftly purchased or sold without experiencing a significant price reduction. The risk associated with liquidity increases with the degree of uncertainty surrounding the timing and cost concession. While a small OTC stock may have significant liquidity risk, a Treasury bill has little to no liquidity risk.

10. Political Risk:

It results from a politically powerful group taking advantage of a politically weaker group, and as a result of multiple factions' attempts to strengthen their respective positions, the variability of return on the impacted assets increases. Political risk refers to the variability of return that results from changes made by the legislative, judicial, or administrative branches of the government, regardless of whether they are motivated by business or political reasons.

11. Industry Risk:

An industry can be viewed as a group of businesses that compete with one another to market a common good. Industry risk is the part of an investment's overall return variability that is brought on by occurrences that have an impact on the businesses and products that make up the industry.

2.7 RISK AND EXPECTED RETURN

The two primary factors affecting an investment decision are risk and projected return. Simple terms: How much do individual results depart from the expected value? Risk is correlated with the variability of the rates of return from an investment. Risk can be quantified statistically using any of the dispersion metrics, including variance, standard deviation, and coefficient of range.

The risk involved in investment depends on various factors such as:

1. The length of the maturity period; investments are riskier when the maturity period is longer.
2. The creditworthiness of the security issuer – The borrower's capacity to make regular interest payments and repay the principal will confer safety to the investment and lower risk.
3. The instrument's or security's nature affects the risk as well. In general, risk-free or least risky investments include government securities and fixed deposits with banks; riskier investments include corporate debt instruments like debentures and ownership instruments like equity shares. Once more, the relative risk ranking of instruments and investment safety are related.
4. Due to the volatility of return rates and the fact that equity investors are still subject to the residual risk of bankruptcy, equity shares are regarded as the riskiest investment.
5. The liquidity of an investment also determines the risk involved in that investment. Liquidity of an asset refers to its quick saleability without a loss or with a minimum of loss.

5. The risk associated with an investment is also influenced by its liquidity. An asset's liquidity is defined as its capacity to be quickly sold without a loss or with a little loss.

6. In addition to the aforementioned elements, there are other more factors that influence risk and investment, such as economic, industry, and firm-specific factors.

The rate of return that the investor anticipates is a significant additional aspect in making an investment decision. The yield and capital growth make up the investor's anticipated rate of return.

Determinants of the Rate of Return

The investor's estimated rate of return is thus largely determined by three factors:

1. The risk-free real rate for time preferences.
2. The anticipated inflation rate.
3. The risk specific to the investment, which is related with it.

Hence, Required return = Risk-free real rate + Inflation premium + Risk premium

ROR = Current yield + Capital gain yield

2.8 RISK-RETURN RELATIONSHIP

In general, taking on more investment risk is the only way to achieve larger investment returns. This isn't necessarily true in every situation, though. For instance, diversification an investment portfolio can frequently yield a comparable return with lower risk than an undiversified investment portfolio. However, as a portfolio gets bigger, there is a limit to how effective diversification may be.

The risk-return trade-off is a key tenet of successful investing. There are numerous different asset classes and investment kinds, including, but not limited to, money market securities, bonds, public equities, private equity, private debt, and real estate. The investment risk associated with each of these asset classes varies. Investments with varying risk-return profiles might help satisfy the various risk appetites of different investor groups.



Take a look at the graph above. Governments issue the first asset class, risk-free bonds, which are typically regarded as "risk-free" investments since a government can print money to settle its debts. As a result, risk-free bonds are the safest asset and offer the lowest rate of return on investments.

We can observe that as the risk-return range increases, each asset class becomes riskier. Each asset class's prospective investment return does, however, also rise.

Private equity is the fifth asset class, and it entails financial investments in privately held businesses that are not exchange-listed. These investments often carry more risk than common stocks, including added hazards like liquidity risk. Private equity does, however, provide investors the best possible investment returns despite these increased risks.

2.9 SUMMARY

- The likelihood that the expected return from the security will not occur might be referred to as risk.
- Uncertainties are a part of every investment, which increases the risk of future investment returns.
- Political, economic, and industry considerations could all be contributing contributors to uncertainty.
- Depending on the cause of the risk, it may become systematic in the future.
- Systematic risk pertains to the market as a whole, whereas unsystematic risk is unique to a particular industry or company.
- Of the risk factors discussed below, only the first three are systematic in character.

- Depending on whether it affects the market as a whole or simply one industry, political risk can be categorised.
- The systematic risk of a security that cannot be mitigated by diversification is measured by beta.
- Beta is a measure of risk that compares the risk of a single stock to the risk of the entire market portfolio of equities.

2.10 UNIT END QUESTIONS

A. Descriptive Questions:

Short Answers:

1. Define Risk.
3. Write note on Purchasing Power Risk.
4. Explain Business Risk.
5. Differentiate between Systematic versus Non-systematic Risk.
6. Discuss Risk and Expected Return.
7. Describe the various types of securities.
8. Enumerate the difference between Equity and Hybrid securities.
9. Write note on Probability V/s Absolute loss in risk management.

B. Fill in the blanks:

1. is the risk associated with the particular secondary market in which a security trades.
2. The rate of return expected by the investor consists of the and
3. Beta is useful for comparing the relative of different stocks.
4. are considered to be the most risky investment.
5. The for some future period is known as the expected return.

Answer:

1. Liquidity risk
2. yield, capital appreciation
3. systematic risk
4. Equity shares
5. anticipated return

2.11 SUGGESTED READINGS

Securities - Risk and return
analysis

- Bonus Shares, A Study of the Dividend and Price Effects of Bonus Shares Issues, Bombay, MacMillan, 1973.
- Graham, Benjamin, David, L., Dodd, Sidney Cottle, et al., Security Analysis: Principles and Techniques, 4th ed., New York McGraw – Hill Book Co. Inc., 1962.
- Granger, Clive W and Morgenstem Oskar, Predictability of Stock Market Prices, Lexington, Health Lexington, 1970.
- Granville, Joseph E., A Strategy of Daily Timings for Maximum Profit, Englewood Cliffs, N.J., Prentice-Hall, 1960.
- Gup, Benton E., Basics of Investing, N.Y. Wiley, 1979.
- Gupta L.C., Rates of Return on Equities: The Indian Experience, Bombay, Oxford University Press, 1981.
- Sudhindra Bhat, Security Analysis and Portfolio Management, Excel Book



EFFICIENT MARKET HYPOTHESIS

Unit Structure

- 3.0 Objectives
- 3.1 Introduction
- 3.2 Random Walk theory
- 3.3 Significance of Efficient Market Hypothesis
- 3.4 Uses of Efficient Market Hypothesis
- 3.5 Summary
- 3.6 Unit End Questions
- 3.7 Suggested Readings

3.0 OBJECTIVES

The main purpose of this chapter is–

- To explain Random walk theory
- To discuss the significance of Efficient Market Hypothesis
- To describe uses of Efficient Market Hypothesis

3.1 INTRODUCTION

The present prices of securities reflect all available information about the security in an efficient capital market because security prices respond quickly to the emergence of fresh information. During the past 20 years, some of the most fascinating and significant academic studies have examined the efficiency of our capital markets. This in-depth study is crucial because the consequences for investors and portfolio managers in the actual world are wide-ranging. Additionally, one of the most divisive topics in investing research is the issue of how efficient capital markets are. Recent research in behavioural finance, which is increasing quickly and has significant consequences for the idea of efficient capital markets, has given the argument a new dimension. Due to its significance and the controversy surrounding it, the terms efficient capital markets and efficient market hypothesis (EMH) must be understood. You should be aware of the research findings that either support or refute the EMH as well as the analyses used to test it. The ramifications of these findings should also be considered as you research alternative investments and build your portfolio.

In essence, tests of market efficiency determine whether the three broad forms of information—past prices, other public information, and inside information—can be used to generate returns on investments that are higher than average. Regardless of the knowledge at hand, it is difficult to generate above-average returns in an efficient market unless exceptional risk is taken.

Furthermore, in such a market, no person or group of investors can regularly outperform other investors. They are also known as weak-form (price information), semi-strong-form (other public information), and strong-form (inside knowledge) tests of market efficiency.

Weak-form and the Random Walk

This is the oldest statement of the hypothesis. It holds that present stock market prices reflect all known information with respect to past stock prices, trends, and volumes. Thus it is asserted, such past data cannot be used to predict future stock prices. Thus, if a sequence of closing prices for successive days for XYZ stock has been 43, 44, 45, 46, 47, it may seem that tomorrow's closing price is more likely to be 48 than 46, but this is not so. The price of 47 fully reflects whatever information is implied by or contained in the price sequence preceding it. In other words, the stock prices approximate a random walk. (That is why sometimes the terms Random Walk

Hypothesis and Efficient Market Hypothesis are used interchangeably). As time passes, prices wander or walk more or less randomly across the charts. Since the walk is random, a knowledge of past price changes does nothing to inform the analyst about whether the price tomorrow, next week, or next year will be higher or lower than today's price.

The weak form of the EMH is summed up in the words of the pseudonymous 'Adam Smith', author of *The Money Game*: "prices have no memory, and yesterday has nothing to do with tomorrow." It is an important property of such a market, so that one might do as well flipping a coin as spending time analyzing past price movements or patterns of past price levels.

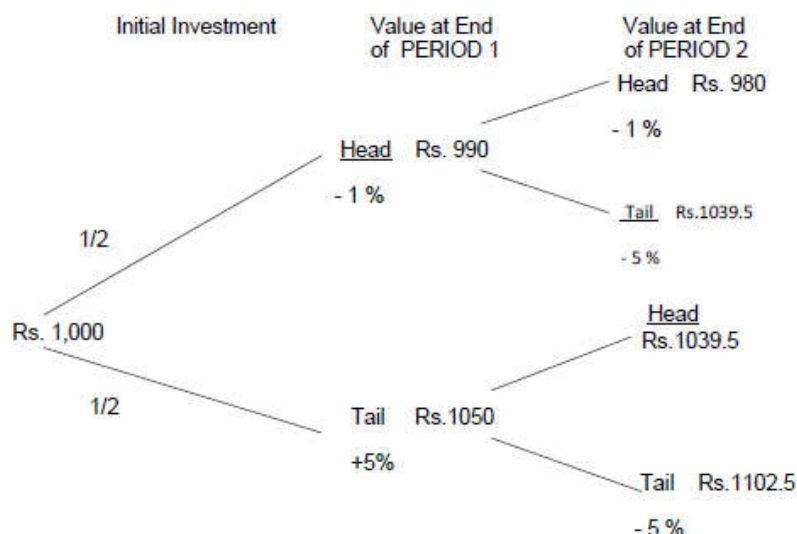
Thus, if the random walk hypothesis is empirically confirmed, we may assert that the stock market is weak-form efficient. In this case any work done by chartists based on past price patterns is worthless.

Random walk theorists usually take as their starting point the model of a perfect securities market in which a relatively large number of investors, traders, and speculators compete in an attempt to predict the course of future prices. Moreover, it is further assumed that current information relevant to the decision-making process is readily available to all at little or no cost. If we 'idealize' these conditions and assume that the market is perfectly competitive, then equity prices at any given point of time would reflect the market's evaluation of all currently available information that

becomes known. And unless the new information is distributed over time in a non-random fashion – and we have no reason to presume this – price movements in a perfect market will be statistically independent of one another. If stock price changes behave like a series of results obtained by flipping a coin, does this mean that on average stock price changes have zero mean? Not necessarily. Since stocks are risky, we actually expect to find a positive mean change in stock prices.

Example: Suppose an investor invests 1,000 in a share. Flip a coin; if heads comes up he loses 1%, and if tails shows up he makes 5%. The value of investment will be as shown in figure.

Random Walk with Positive Drift (Two-Period-Case)



Suppose that an investor flips the coin (looks up the prices) once a week and it is his decision when to stop gambling (when to sell). If he gambles only once, his average return is $\frac{1}{2} \times '990 + \frac{1}{2} \times '1050 = '1020$ since the probabilities of 'heads' or 'tail' are each equal to $\frac{1}{2}$. The investor may decide to gamble for another week. Then the expected terminal value of his investment will be:

$$\frac{1}{2} \times 980.1 + \frac{1}{4} \times 1039.5 + \frac{1}{5} \times 1039.5 + \frac{1}{4} \times 1102.5 = '1040.4$$

Now assume that these means are equal to the value of the given shares at the end of the first week and at the end of the second week. The fact that the shares went up in the first period, say to 1050, does not affect the probability of the price going up 5% or that ongoing changes in each period are independent of the share price changes in the previous period. In each period, we would obtain the results that one could obtain by flipping a coin, and it is well known that the next outcome of flipping a coin is independent of the past series of 'heads' and 'tails.' Note, however, that on an average we earn 2% if we invest for one week and 4.04% if we invest for two weeks. Thus, the random walk hypothesis does not contradict the theory that asserts that risky assets must yield a positive mean return. We say in such a case, a random walk process with a

“positive drift” can characterize share price changes. In our specific Efficient Market Hypothesis example, the drift is equal to:

$1/2 \times 5\% + 1/2 \times (-1\%) = 2\%$, which implies that on average the investment terminal value increases every period by 2%.

Thus, reflecting the historical development, the weak form implies that the knowledge of the past patterns of stock prices does not aid investors to attain improved performance. Random walk theorists view stock prices as moving randomly about a trend line, which is based on anticipated earning power. Hence they contend that (1) analysing past data does not permit the technician to forecast the movement of prices about the trend line and (2) new information affecting stock prices enters the market in random fashion, i.e. tomorrow's news cannot be predicted nor can future stock price movements be attributable to that news.

Testing Market Efficiency

The EMH can be tested in a variety of methods. Direct and indirect tests of market efficiency have been developed by analysts. Certain investing methods or trading rules are evaluated using direct tests. A test of a particular technical indicator's predictive power is an illustration of a direct test. Statistics-based testing of pricing or returns are known as indirect tests. For instance, the serial correlation of returns should be near to zero if prices move in a random manner.

Establishing a Benchmark: Test of the EMH must usually establish some sort of benchmark. The most common benchmark is the so-called buy-and-hold portfolio.

The Time Factor: The time period(s) selected can, of course, always be criticized. A trading rule partisan may respond to a conclusion that the rule did not work by saying, “of course my trading rule didn't work over that period.”

Kiss and Tell: Suppose that someone discovered an investment strategy that really worked and made a lot of money. Why would this person want to tell anyone? He or she could try to make money writing a book or an investment newsletter describing the strategy, but it would probably generate more money if keep secret. Suppose an analyst discovers that stocks beginning with the letter K rise on Wednesdays and fall on Fridays.

Market Efficiency: Implications

Economist Dick Thaler In an August, FT opinion said quite nice things about "The Myth of the Rational Market." In it, he makes the case that the efficient market hypothesis consists of two main ideas, "No Free Lunch" and "The Price is Right," that have met very different fates over the past decade or so. After running through the history, he concludes:

What lessons should we draw from this? On the free lunch component there are two. The first is that many investments have risks that are more correlated than they appear. The second is that high returns based on high

leverage may be a mirage. ... On the price is right, if we include the earlier bubble in Japanese real estate, we have now had three enormous price distortions in recent memory. They led to misallocations of resources measured in the trillions and, in the latest bubble, a global credit meltdown. If asset prices could be relied upon to always be "right", then these bubbles would not occur. But they have, so what are we to do?

While imperfect, financial markets are still the best way to allocate capital. Even so, knowing that prices can be wrong suggests that governments could usefully adopt automatic stabilising activity, such as linking the down-payment for mortgages to a measure of real estate frothiness or ensuring that bank reserve requirements are set dynamically according to market conditions. After all, the market price is not always right.

3.3 SIGNIFICANCE OF EFFICIENT MARKET HYPOTHESIS

According to the Efficient Market Hypothesis (EMH), financial markets are "informationally efficient," which means that the present market price of a security reflects all of the information that is currently available about the security. The EMH is significant because it affects investors, financial analysts, and politicians in a significant way.

One of the main conclusions drawn from the EMH is that it is extremely challenging for investors to continuously outperform the market over the long run. This is because, in accordance with the EMH, the market price already incorporates all available information, making it challenging to determine whether a security is cheap or overvalued. As a result, investors may be better off investing in a diversified portfolio of stocks or other securities, rather than attempting to pick individual winners.

The EMH also has the critical implication that financial analysts may not be very good at forecasting future stock values. Any new information that an analyst discovers is likely to already be reflected in the stock price if the market is truly informationally efficient, making it impossible to profit from this information. This has significant ramifications for financial regulation since it implies that implementing more stringent disclosure standards or other types of market openness may only have marginal benefits.

3.4 USES OF EFFICIENT MARKET HYPOTHESIS

The Efficient Market Hypothesis (EMH) has several uses and implications for investors, financial analysts, and policymakers. Here are some of the most important uses of the EMH:

- **Investing strategy:** According to the EMH, it is exceedingly challenging for investors to continuously outperform the market over the long run because a security's current market price already takes into account all of the information that is currently known about it. As a result,

rather than trying to choose specific winners, investors may be better suited investing in a diverse portfolio of stocks or other securities. Efficient Market Hypothesis

- Risk management: A portfolio's risk can be managed with the aid of the EMH. It is challenging for any one event or piece of news to have a major impact on the market price of a security because the market price already fully represents all available information. Hence, diversification among several securities can aid in lowering the risk that the portfolio will be impacted by a single asset or event. Financial regulation: The EMH has important implications for financial regulation. If financial markets are truly informationally efficient, then there may be limited benefits to mandating increased disclosure requirements or other forms of market transparency. Policymakers may need to consider other approaches to improve market outcomes, such as reducing information asymmetry or promoting competition.
- Academic research: The EMH is a widely studied and debated topic in finance, and has led to a large body of academic research. Researchers have used the EMH to test various theories about financial markets, and to explore the relationship between information, prices, and market efficiency.

3.5 SUMMARY

- Hypothesis and Efficient Market Hypothesis are used interchangeably). As time passes, prices wander or walk more or less randomly across the charts.
- Since the walk is random, a knowledge of past price changes does nothing to inform the analyst about whether the price tomorrow, next week, or next year will be higher or lower than today's price.
- One of the main conclusions drawn from the EMH is that it is extremely challenging for investors to continuously outperform the market over the long run.
- A market portfolio is a portfolio that includes a weighted total of each asset on the market, with weights based on their relative market presence (with the necessary assumption that these assets are infinitely divisible).
- According to Weak-Form and the Random Walk, current stock market prices accurately reflect all available knowledge regarding historical stock prices, trends, and volumes. Thus, it is said that such historical data cannot be used to forecast stock prices in the future.

3.6 UNIT END QUESTIONS

A. Descriptive Questions:

1. Explain Random Walk theory
2. Discuss the significance of Efficient Market Hypothesis

3. What are the uses of Efficient Market Hypothesis?

B. Fill in the blanks:

1. Direct and indirect tests of market efficiency have been developed by.....
2. One of the main conclusions drawn from the EMH is that it is extremely challenging for to continuously outperform the market over the long run.
3. A risk can be managed with the aid of the EMH.
4. may need to consider other approaches to improve market outcomes, such as reducing information asymmetry or promoting competition.
5. The has important implications for financial regulation.

Answer:

1. analysts
2. investors
3. portfolio's
4. Policymakers
5. EMH

3.7 SUGGESTED READINGS

- Graham, Benjamin, David, L., Dodd, Sidney Cottle, et al., Security Analysis: Principles and Techniques, 4th ed., New York McGraw – Hill Book Co. Inc., 1962.
- Granger, Clive W and Morgenstem Oskar, Predictability of Stock Market Prices, Lexington, Health Lexington, 1970.
- Granville, Joseph E., A Strategy of Daily Timings for Maximum Profit, Englewood Cliffs, N.J., Prentice-Hall, 1960.
- Gup, Benton E., Basics of Investing, N.Y. Wiley, 1979.
- Gupta L.C., Rates of Return on Equities: The Indian Experience, Bombay, Oxford University Press, 1981.
- Sudhindra Bhat, Security Analysis and Portfolio Management, Excel Books



EQUITY RESEARCH AND VALUATION

Unit Structure

- 4.0 Objectives
- 4.1 Introduction
- 4.2 Sources of financial information
- 4.3 Industry analysis
- 4.4 Company analysis
- 4.5 Valuation of Equity shares
- 4.6 Summary
- 4.7 Unit End Questions
- 4.8 Suggested Readings

4.0 OBJECTIVES

The main purpose of this chapteris–

- To discuss the Sources of financial information
- To understand Industry analysis
- To describe company anlaysis
- To explain Valuation of Equity shares

4.1 INTRODUCTION

Equity research is the process of analyzing and valuing stocks, and it involves examining a company's financial statements, industry trends, and macroeconomic factors to determine the intrinsic value of its shares. The purpose of equity research is to provide investors with information to help them make informed investment decisions.

Valuation is an important part of equity research, and it involves determining the intrinsic value of a company's shares based on its financial statements, market conditions, and other relevant factors.

4.2 SOURCES OF FINANCIAL INFORMATION

In security analysis, sources of financial information can be divided into two categories: primary sources and secondary sources.

Primary sources of financial information for security analysis include:

- Company financial statements: Financial statements such as the income statement, balance sheet, and cash flow statement can provide

detailed information about a company's financial performance, liquidity, and solvency.

- Annual reports: Publicly traded companies are required to publish annual reports that provide detailed information about their business operations, financial performance, and strategic plans.
- SEC filings: Companies are required to file various reports with the Securities and Exchange Commission (SEC), such as 10-K and 10-Q filings, which provide detailed financial and non-financial disclosures.
- Company presentations: Some companies may provide presentations to investors that offer additional insights into their financial performance and strategic plans.

Secondary sources of financial information for security analysis include:

- Financial news websites: Websites like Bloomberg, Reuters, and CNBC can provide up-to-date financial news and analysis.
- Investment research reports: Research reports from investment banks, brokerage firms, and independent research providers can provide analysis and recommendations on specific companies or industries.
- Market data providers: Companies like S&P Global Market Intelligence and FactSet provide financial data, news, and analysis.
- Financial databases: Databases such as Bloomberg Terminal and Refinitiv Eikon provide real-time financial data and analytics.
- Trade publications: Industry-specific trade publications can provide information on market trends, new product developments, and industry-specific financial metrics.
- Social media: Platforms like Twitter, Reddit, and LinkedIn can provide valuable insights and perspectives on financial news and trends.

It's important to use a combination of primary and secondary sources of financial information and verify the accuracy of the information before making any investment decisions.

4.3 INDUSTRY ANALYSIS

The performance of the industry depends on many factors one of them is industry life cycles which involve various stages of where an industry performs. For example, the biotechnology industry which is still new, so the investors may find many firms giving higher rate of returns and seeing that the investment rate also increases in those firms. Whereas the older industry like the public utility gives the lower rate of return and hence gets lower rate of investment in their firms.

As the biotechnology industry is new so they are able to use their best technology available that create greater opportunities for investments in resources that are highly profitable. Also, their new products are protected by patents and so their profit margins are high. Since they have investment opportunities are highly lucrative so they plough back their profits into the firm so as to increase greater profits. But with time, profit will reduce as seeing more profit in this industry more firms will be attracted and so the more competition will reduce the profit margin. This will further lead to slow growth and then finally leads to negative growth in the industry.

So, this analysis shows the industry life cycle is divided into four stages:

1. Start-up stage:

In this stage, the industry is characterized by growth that increases rapidly because of new technology and product such as personal computer in 1980s and personal phones in 1990s. It is unpredictable to analyse which firm will perform better in the long run and which will be successful and which firms in that industry will become the industry leader.

2. Consolidation stage:

When the product becomes established, emergence of the industry leader begins to arise. The firms that survive in the start-up stage are more stable, and also its prediction of market share also becomes easier in this stage. Also, the performance of firms that could survive starts matching to the overall performance of the industry. At this stage, the industry still seems to be faster growing because the products become commonly used and also products penetrate the marketplace.

3. Maturity stage:

At this stage, the products reach its full potential for use by its consumers. Also, here the profits margin becomes small, with slow sales, price competition increases considerably, market penetration become high and also little opportunity to expand further.

4. Relative Decline:

In this stage, the industry might start to shrink or grow at lower rate than the overall economy. This is due to obsolesce in products, competition in new markets and low-cost suppliers.

4.4 COMPANY ANALYSIS

After analyzing the economic and industry conditions, the financial health of the company is analysed by the investors. For this investor analyse the financial statements of the company, where they can easily calculate the ratios of the company that can be categorized into price, profitability, leverage, efficiency, and liquidity. The ratio analysis is performed on the ratios that are easily comparable within the similar or the same industries.

The some of the ratios from each category those are essential at the time of analysis are stated below:

1. P/E Ratio:

The price/earnings ratio is a price ratio which is calculated by dividing stock price of the current period with the earning per share of previous four quarters.

For example:

Current Stock price = Rs 20

Earnings per share of last four quarters = Rs.2

P/E Ratio = Rs. 20/ Rs. 2

= Rs. 10

The investor's expectation of future performance affects the determination of the current price to earnings ratio of the company. The investors use the approach to compare the P/E ratio of companies within the same industry. Companies with lower P/E ratio are better when everything else remain same.

2. Net Profit Margin:

It is the profitability ratio that is calculated by dividing net income by total sales of a company. It indicates how much profit a company is able to earn out of the sales of the company.

Net Profit Margin = Net Profit / Total Sales

3. Book Value per Share

It is the price ratio that is calculated by dividing total net assets (assets minus liabilities) by total outstanding shares of the company. It is the good method to check if the stock is under priced or overpriced. If the stock is selling at a price that is below the book value, then the security is under-priced.

4. Current Ratio:

It is the liquidity ratio which is calculated by dividing current assets by current liabilities of a company. It tells the investor that whether the company is able to meet its current debt obligations or not. If the ratio is more than 2:1 then it is said that the company is liquid. If the company has the current ratio 3:1 then this means the current assets of that company is sufficient to pay three times the current liabilities of a company.

Current Ratio = Current Assets / Current liabilities

5. Debt Ratio:

It is a leverage ratio which is calculated by the dividing total liabilities by total assets. It tells how much total assets are financed with the debt. If the ratio is 30% then it is said that 30% of assets are financed by the borrowed funds and rest through another source of finance. When the economy is in stress or there is the hike in interest rates, then the companies with high debt ratio have to bear financial problems. But in good times, the higher debt ratio helps in increase the profitability of companies by financing growth at low cost.

$$\text{Debt Ratio} = \text{Total Debt} / \text{Total Assets}$$

5. Inventory Ratio:

It is an efficiency ratio that is calculated by dividing total cost of goods sold by the average inventory. It tells the investor how the inventories are managed by telling how many times the inventories are replaced or turn over. This ratio depends on the nature of industry the company falls in and also it is important to compare the ratio between the companies in the same industry.

$$\text{Inventory Ratio} = \text{Total Cost of Goods Sold} / \text{Average inventory}$$

4.5 VALUATION OF EQUITY SHARES

The valuation of equity shares involves estimating the intrinsic value of a company's stock based on various financial and non-financial factors. Here are some commonly used methods for valuing equity shares:

- **Discounted Cash Flow (DCF) analysis:** This method estimates the present value of a company's future cash flows by discounting them back to their present value using a discount rate. The DCF analysis is based on a company's expected future cash flows, growth rates, and risk factors.
- **Price-to-Earnings (P/E) ratio:** The P/E ratio is calculated by dividing the company's current stock price by its earnings per share (EPS). This method compares the company's current stock price to its earnings and can be used to compare the valuation of the company to its peers.
- **Price-to-Book (P/B) ratio:** The P/B ratio is calculated by dividing the company's current stock price by its book value per share. The book value per share is the total assets minus liabilities divided by the number of outstanding shares. This method compares the company's current stock price to its book value and can be used to compare the valuation of the company to its peers.
- **Dividend Discount Model (DDM):** The DDM estimates the intrinsic value of a company's stock based on the present value of its future dividends. The model assumes that the company will continue to pay dividends in the future and that the dividends will grow at a constant rate.

- **Free Cash Flow (FCF) to Equity:** This method estimates the intrinsic value of a company's equity shares based on its free cash flow to equity, which is the amount of cash that is available to the company's equity shareholders after all expenses and investments are made. This method focuses on the company's ability to generate cash and can be used to compare the valuation of the company to its peers.

It is important to note that no single valuation method is perfect, and different methods may produce different results. It is important to consider multiple factors and use a combination of valuation methods to arrive at a more accurate estimate of a company's intrinsic value.

4.6 SUMMARY

- Industry and company analysis are two important components of equity research that help investors make informed investment decisions.
- Industry analysis involves examining the trends, competitive landscape, and macroeconomic factors affecting a particular industry. This analysis helps investors understand the broader context in which a company operates and identify trends that may impact its future growth prospects.
- Company analysis involves analyzing a specific company's financial statements, management team, business model, competitive advantages, and other relevant factors to determine its intrinsic value and growth potential. This analysis helps investors evaluate whether a company is undervalued or overvalued and make informed investment decisions.
- Both industry and company analysis are important components of equity research and are used by investors to make informed investment decisions.
- By examining industry trends and analyzing individual companies, investors can identify undervalued stocks and build a diversified portfolio that is well-positioned for long-term growth.

4.7 UNIT END QUESTIONS

A. Descriptive Questions:

1. Discuss the Primary sources of financial information.
2. What are the Secondary sources of financial information?
3. Write note on Industry analysis.
4. Write note on Company analysis.
5. Discuss the industry life cycle stages.
6. What is P/E ratio?
7. Explain the methods used for valuing equity shares.

B. Fill in the blanks:

1. method estimates the present value of a company's future cash flows by discounting them back to their present value using a discount rate.
2. The estimates the intrinsic value of a company's stock based on the present value of its future dividends.
3. indicates how much profit a company is able to earn out of the sales of the company.
4. In stage, the industry might start to shrink or grow at lower rate than the overall economy.
5. Industry life cycle is divided into stages.

Answer:

1. Discounted Cash Flow (DCF) analysis
2. Dividend Discount Model (DDM)
3. Net Profit Margin
4. Relative Decline
5. four

4.8 SUGGESTED READINGS

- Bonus Shares, A Study of the Dividend and Price Effects of Bonus Shares Issues, Bombay, MacMillan, 1973.
- Graham, Benjamin, David, L., Dodd, Sidney Cottle, et al., Security Analysis: Principles and Techniques, 4th ed., New York McGraw – Hill Book Co. Inc., 1962.
- Granger, Clive W and Morgenstem Oskar, Predictability of Stock Market Prices, Lexington, Health Lexington, 1970.
- Granville, Joseph E., A Strategy of Daily Timings for Maximum Profit, Englewood Cliffs, N.J., Prentice-Hall, 1960.
- Gup, Benton E., Basics of Investing, N.Y. Wiley, 1979.
- Gupta L.C., Rates of Return on Equities: The Indian Experience, Bombay, Oxford University Press, 1981.
- Sudhindra Bhat, Security Analysis and Portfolio Management, Excel Books



FIXED INCOME SECURITY ANALYSIS

Unit Structure

- 1.0 Learning Objectives
- 1.1 Introduction
- 1.2 Systematic and unsystematic risk
- 1.3 Warrants and convertibles
- 1.4 Bond valuation
- 1.5 Summary
- 1.6 Unit End Questions
- 1.7 References

5.0 LEARNING OBJECTIVES

After studying this unit, you will be able:

- To understand systematic and unsystematic risk
- To discuss warrants and convertibles
- To explain bond valuation
- To describe Volatility term structure

5.1 INTRODUCTION

An investment that offers a return in the form of regular, set interest payments as well as the ultimate repayment of principal at maturity is referred to as a fixed-income security. A fixed-income security's payments are predetermined, as opposed to variable-income securities, whose payments fluctuate depending on some underlying factor, such as short-term interest rates.

Fixed-Income Securities are debt products that offer investors fixed interest payments in the form of coupon payments. The invested money is returned to the investor at maturity, while interest payments are normally made every two years. The most popular type of fixed-income securities are bonds. Businesses raise funds by selling investors fixed-income products.

A bond is an investment product that businesses and governments issue to raise money for operations and project financing. Government and corporate bonds make up the majority of bonds, which can also have a range of maturities and face values. The amount that the investor will get when the bond matures is known as the face value. On major exchanges, corporate and government bonds are often listed with \$1,000 face prices, commonly referred to as the par value.

5.2 SYSTEMATIC AND UNSYSTEMATIC RISK

Every investment, including shares and debentures, has some risk. Systematic risk and unsystematic risk are the two main types of risk, and they together make up total risk. The systemic risk is a result of outside, uncontrollable factors that don't pertain to any one sector of the economy or type of asset and affect the entire market, causing price fluctuations across the board for all securities.

Unsystematic risk, on the other hand, is defined as the risk that results from known and regulated variables that are industry- or security-specific.

Definition of Systematic Risk

By "systematic risk," we consider variations in security returns brought on by macroeconomic business elements like social, political, or economic concerns. These variations are connected to shifts in the market's overall return. Changes in governmental policy, natural disasters, changes in the domestic economy, factors affecting the global economy, etc. are all sources of systematic risk. Over time, the risk could cause investments' values to decline. It is separated into three groups, which are described as follows:

- **Interest risk:** Risk caused by the fluctuation in the rate or interest from time to time and affects interest-bearing securities like bonds and debentures.
- **Inflation risk:** Alternatively known as purchasing power risk as it adversely affects the purchasing power of an individual. Such risk arises due to a rise in the cost of production, the rise in wages, etc.
- **Market risk:** The risk influences the prices of a share, i.e. the prices will rise or fall consistently over a period along with other shares of the market.

Definition of Unsystematic Risk

Unsystematic risk is the risk brought on by changes in a company's security returns as a result of internal, or micro-economic, or organisational factors. The elements that lead to such risk are related to a specific security of a business or industry, thus they only have an impact on that particular organisation. If the essential steps are done in this regard, the company can avoid the risk. It has been separated into two categories: business risk and financial risk.

- **Business risk:** The company's performance is a risk that comes with securities. A business risk is when a corporation performs worse than average. Business risks can result from a variety of circumstances, including shifting government regulations, increased competition, shifting consumer tastes and preferences, creation of substitute products, advancements in technology, etc.

- Financial risk: Alternatively known as leveraged risk. When there is a change in the capital structure of the company, it amounts to a financial risk. The debt – equity ratio is the expression of such risk.

Another difficult goal is to avoid both systematic and irrational risk. Systematic risk is brought on by external influences, which are both inescapable and uncontrollable. Additionally, it impacts the entire market, but it can be minimised through hedging and asset allocation. Since internal factors are what produce unsystematic risk, it may be easily managed and avoided, at least in part, by portfolio diversification.

5.3 WARRANTS AND CONVERTIBLES

Securities used in derivative investment transactions include warrants and convertibles. Both of these kinds of options grant holders the right to make additional investments in certain firm stocks. A warrant specifically grants investors the right to purchase the underlying security at a specific price in the future. Convertibles, on the other hand, give investors the option to convert their security into common shares at a later time. In order to help investors, maximise their returns, both of these securities are available as investment choices. However, these two are not equivalent. Therefore, it is crucial to understand the intent behind the usage of these two instruments. Investors should therefore be aware of and understand the distinction between warrants and convertibles.

Warrants:

It grants investors the right to purchase the underlying share, bond, or other security at a specific price and date in the future. Investors are not required to purchase the underlying security at that moment or that price, though. The investor must also pay the predetermined amount to purchase the stock, investment, or instrument if they choose to exercise the warrant. Many warrant features are also found in options.

Each warrant contains information on how many underlying securities, at what price, and on what date, an investor may purchase them. A warrant may be valid for a variety of periods of time, including several years. Warrants are also tradable by investors, and their value is based on both time and intrinsic value. A warrant will be worth more if it has more time until expiration. If the market value of the underlying security is higher than the exercise price of the warrant, the situation will be similar.

Convertibles

Convertibles, on the other hand, provide investors the choice to convert bonds or preferred stocks into common stock at a future date and price. This kind of security is typically used by businesses seeking immediate money or without access to conventional lending solutions. The number of common shares an investor would receive in place of the bond or preference shares is determined by a firm using a conversion ratio. Additionally, the instrument is fully convertible, converting the entire bond and discharging the existing security. Alternately, it may be partially

convertible, in which case a portion will be changed to common stock and the balance will be retained as a bond.

Difference Between Warrants and Convertibles

○ **Time Frame**

Given that warrants have an expiration date, many people consider them to be short-term investments. Convertibles, on the other hand, last longer and are therefore long-term options.

○ **Cash Outflow**

When a warrant is exercised, the investor must provide more funds in order to purchase the shares. As a result, in this case, the corporation receives additional funds from the instrument holder. However, from the standpoint of investors, there is no additional capital outflow in the case of convertibles. The conversion ratio is used to convert the same security to common stock.

○ **Fixed Price**

The warrants contain information at the time of issuance regarding the price at which an investor will be able to purchase the underlying security in the future. And this price won't change till the contract ends. Convertibles, on the other hand, do not have a fixed price. The number of common shares that an investor would receive upon converting the bond or preference shares is instead determined by the issuer using a conversion ratio.

○ **Detachable**

There is something special about warrants. They can be traded separately from the underlying security because they are detachable. Investors cannot exchange convertibles individually since they are not separable.

5.4 BOND VALUATION

The present value of anticipated future returns, earnings, or cash flows from a bond investment is determined using the bond valuation method. The valuation method is used by an investor to analyse if the cost of a debt instrument, such as a bond, is reasonable given the potential returns.

An investor might use bond valuations to help them decide whether the future yields from a bond investment are right for their portfolio. A bond's trading prices, interest rate, and par value are thus used by an investor to determine the bond's value. While the bond's interest rates and par value remain the same, changes occur in the bond prices and investors' returns over time.

A bond is a debt instrument, which means the issuer borrows money from a lender or investor. The bond issuer agrees to a set interest rate in return for the investor's ownership of the bond. As a result, the interest

gives the bondholder a consistent income until the bond's maturity date. As a result, at maturity, the borrower pays the bondholder the face value of the bond, less or more, as appropriate.

A zero-coupon bond, on the other hand, won't give the investor or bondholder any coupon payments or timely interest. Instead, the bond price is reduced or the bond issuer issues the bond at a discounted rate to its face value in the case of a zero-coupon bond. As a result, at bond maturity, the investor is assured to receive the bond's full-face value. As a result, the investor earns interest on the difference between the bond's purchase price and par value at maturity.

Due to the lower price of the bond at purchase, zero coupon bond valuation typically results in higher yields to maturity or returns for an investor when the bond matures.

A bond's coupon rate is expressed as a proportion of the bond's principal or par value. Therefore, the investor will get this percentage amount as part of the periodic coupon payments at predetermined intervals, such as quarterly, semi-annually, or annually. So, useful determinants for bond valuation are the bond price, principal value or par value, coupon rate of a bond, and time till maturity.

Formula of Bond Valuation

1) Calculating the value of a single **cash flow** from future coupon payment by estimating its **present value** for an investor,

$$PV = C/(1+r)^1 + C/(1+r)^2 + \dots + C/(1+r)^n + F/(1+r)^n$$

where:

PV = Present value of the bond C = Coupon payment r = Discount rate or yield to maturity n = Number of periods until maturity F = Face value or principal amount

In this formula, the coupon payment is the fixed annual interest rate paid by the bond issuer, which is usually a percentage of the bond's face value. The discount rate or yield to maturity is the required rate of return that an investor expects to earn on the bond.

The sum of the present value of all the expected cash flows from the bond is equal to the bond's current value. If the bond is trading at a discount to its face value, the present value of the cash flows will be less than the face value. If the bond is trading at a premium to its face value, the present value of the cash flows will be greater than the face value.

A bond's **yield to maturity** or discount rate gives the investor an estimate of how their future returns might change due to inflations or currency changes.

The value of a bond to an investor is explained by its bond valuation. Based on the current value of expected future returns, it aids an investor in

making an informed decision when making an investment or expenditure. As a result, in order to maximise their utility, investors choose to invest in bonds with higher bond yields that will maximise their returns. Consequently, to calculate bond valuation or future bond price, an investor should have certain crucial information for its calculation. Such as,

1. **Coupon rate**
2. Estimated coupon payments
3. Payment cycles
4. Yield to maturity, also known as the discount rate, basically adjusts the future returns based on the market interest rate, inflation, and currency fluctuations.
5. Date of maturity of the bond or number of years

5.5 SUMMARY

- The bond market, also known as the debt market or credit market, is a financial exchange where investors can trade in debt instruments issued by both governments and corporations.
- The primary market and secondary market are the two main divisions that make up the bond market.
- The variable rate saving bonds 2020 (FRSB) that the RBI issues are also known as RBI bonds. 7-year taxable bonds with an interest rate that fluctuates throughout the course of the bond's term.
- A coupon bond is a specific kind of bond that has attached coupons and makes periodic interest payments (usually annually or semi-annually) throughout its life as well as its par value upon maturity.
- A zero-coupon bond is a specific variety of fixed-rate bond. In this instance, there is no interest paid from the time the bond is issued until it matures. they "pay" a set coupon of 0% as a result.
- A floater is more beneficial to the holder as interest rates are rising because it allows a bondholder to participate in the upward movement in rates since the coupon rate of the bond will be adjusted upwards.
- A forward rate is a set price that is agreed upon by all parties for the delivery of a good at a particular future date.

5.6 UNIT END QUESTIONS

A. Descriptive Questions:

Short Answers:

1. Differentiate between systematic and unsystematic risk.

2. Write note on Bond valuation.
3. Write note on warrants.
5. What do you understand by Bond Valuation?

6. Explain the difference Between Warrants and Convertibles.

B. Fill in the blanks:

1. is the amount of money the bond will be worth when it matures.
2. A issued by the central or state governments of India is a government securities bond.
3. is also known as a "pure discount bond".
4. A floating rate note (FRN), also known as a
5. The price stated in real-time for the immediate settlement of a contract is known as a

Answers:

1- Face value, 2- debt instrument, 3- Zero coupon bond, 4-floater, 5- spot rate or spot price.

5.7 REFERENCES

- Bonus Shares, A Study of the Dividend and Price Effects of Bonus Shares Issues, Bombay, MacMillan, 1973.
- Graham, Benjamin, David, L., Dodd, Sidney Cottle, et al., Security Analysis: Principles and Techniques, 4th ed., New York McGraw – Hill Book Co. Inc., 1962.
- Granger, Clive W and Morgenstem Oskar, Predictability of Stock Market Prices, Lexington, Health Lexington, 1970.
- Granville, Joseph E., A Strategy of Daily Timings for Maximum Profit, Englewood Cliffs, N.J., Prentice-Hall, 1960.
- Gup, Benton E., Basics of Investing, N.Y. Wiley, 1979.
- Gupta L.C., Rates of Return on Equities: The Indian Experience, Bombay, Oxford University Press, 1981.
- Sudhindra Bhat, Security Analysis and Portfolio Management, Excel Books



INDEXING AND BENCHMARKING

Unit Structure

- 6.0 Learning Objectives
- 6.1 Introduction
- 6.2 Indexing and Benchmarking
 - 6.2.1 Creation of an index
 - 6.2.2 Adjusting for corporate adjustments in the index
 - 6.2.3 Tracking an index.
- 6.3 Summary
- 6.4 Unit End Questions
- 6.5 References

6.0 LEARNING OBJECTIVES

After studying this unit, you will be able:

- To understand Indexing and Benchmarking
- To discuss Creation of an index
- To explain Tracking an index

6.1 INTRODUCTION

Indexing and benchmarking are two important concepts in finance that are commonly used to measure and evaluate the performance of investment portfolios.

Indexing refers to the practice of investing in a portfolio of securities that is designed to replicate the performance of a specific market index, such as the S&P 500 or the Nasdaq Composite. Indexing is based on the premise that it is difficult for active managers to consistently outperform the market over the long term, and that a low-cost index fund can provide investors with broad market exposure and competitive returns.

Benchmarking, on the other hand, is the process of comparing the performance of an investment portfolio to a specific benchmark, such as a market index or a peer group of similar funds. Benchmarking is used to evaluate the relative performance of an investment portfolio, and can help investors to identify areas where they may be underperforming or outperforming their peers.

6.2 INDEXING AND BENCHMARKING

Indexing:

An index is a tool for tracking the performance of a collection of assets in a consistent manner. The performance of a group of securities meant to mirror a particular market segment is often measured through indexes.

Other financial or economic indicators, such as interest rates, inflation, or manufacturing production, are also measured by indices. Indexes are frequently used as benchmarks to measure how well a portfolio's returns performed. One well-liked method of investing is indexing, which involves passively trying to mimic an index rather than trying to outperform it.

A measure or indicator of anything is called an index. It usually refers to a statistical measurement of change in a securities market in finance. Stock and bond market indices for financial markets are made up of a fictitious portfolio of securities that represent a specific market or a subset of it. (Investing directly in an index is not possible.) Common benchmarks for the American stock and bond markets are the S&P 500 Index and the Bloomberg US Aggregate Bond Index, respectively.

Each stock market and bond market index is calculated using a different formula. The majority of the time, an index's relative movement is more significant than the actual numeric value it represents. For instance, if the FTSE 100 Index is trading at 6,670.40, investors can infer that the index has increased by almost seven times from its initial base level of 1,000.

Index Investing

Indexes are frequently used as benchmarks to compare the performance of exchange-traded funds and mutual funds (ETFs). To give investors an idea of how much more or less the managers are making on their money than they would in an index fund, many mutual funds, for instance, benchmark their returns to the return in the S&P 500 Index.

A type of passive fund management is "indexing." Instead of actively stock selecting and market timing—that is, deciding which securities to invest in and planning when to buy and sell them—a fund portfolio manager instead creates a holdings list that closely resembles the stocks of a specific index. The theory is that by closely matching the index's profile—the stock market overall or a significant portion of it—the fund will match its performance.

Since indexes cannot be purchased directly, index funds are developed to monitor their performance. These funds contain securities that closely resemble those contained in an index, enabling an investor to place a fee-based wager on the index's performance. The widely used Vanguard S&P 500 ETF (VOO), which closely resembles the S&P 500 Index, is an illustration of an index fund.

6.2.1 Creation of Index

Indexes can be constructed in a variety of methods, frequently taking into account how to weight the index's various components. These are the three key methods:

- A market-cap, or capitalization-weighted index, such as the S&P 500, gives more weight to the index's constituents with the highest market capitalization (market value).
- A price-weighted index gives the components with the highest prices more weight (such as the Dow Jones Industrial Average)
- An equal-weighted index assigns the same weights to each component (this is sometimes called an unweighted index)

How Beneficial Are Indexes?

Indexes are helpful in that they offer reliable benchmarks that may be used to gauge the success of a strategy or portfolio's investments. One can determine a strategy's true performance by analysing how it performs in comparison to a benchmark.

Indexes can give investors a streamlined view of a sizable market segment without requiring them to look at each and every asset included in the index. For instance, it would be impractical for a regular investor to analyse hundreds of different stock prices in order to comprehend how various technology businesses' financial situations change over time. A sector-specific index might display the sector's typical tendency.

6.2.2 Adjusting for corporate adjustments in the index

Corporate actions such as stock splits, mergers, and spin-offs can impact the components of an index and its performance. As a result, index providers may adjust the index to account for these corporate actions.

When a stock split occurs, for example, the total number of shares outstanding for a company increases, and the price per share decreases proportionally. To maintain the proper weighting of the stock in the index, the index provider may adjust the number of shares for the affected company in the index calculation.

Similarly, in the case of a merger or acquisition, the index provider may adjust the weightings of the companies involved in the merger or acquisition to reflect the new corporate structure. If one company acquires another, the index provider may remove the acquired company from the index and replace it with the acquiring company.

Spin-offs are another type of corporate action that may require adjustments to the index. In a spin-off, a company creates a new subsidiary and distributes shares of the subsidiary to its existing shareholders. To reflect the new corporate structure, the index provider

may add the new subsidiary to the index and adjust the weightings of the parent company and the new subsidiary accordingly.

6.2.3 Tracking an index

Tracking an index refers to the process of replicating the performance of a particular stock market index by investing in a portfolio of securities that mirrors the components and weightings of the index. This is typically done through the use of index funds or exchange-traded funds (ETFs).

An index fund is a type of mutual fund that aims to replicate the performance of a specific index by holding all the securities in the index in the same proportion as their weight in the index. Index funds are managed passively and seek to minimize transaction costs and fees by holding a diversified portfolio of securities that closely matches the index they track.

ETFs are similar to index funds, but they trade like individual stocks on an exchange, allowing investors to buy and sell shares throughout the day at market prices. Like index funds, ETFs aim to replicate the performance of a particular index, but they may use different strategies to achieve this goal, such as using derivatives or sampling the index.

By tracking an index, investors can gain exposure to a broad range of stocks with low transaction costs and fees. Additionally, index tracking is a passive investment strategy that requires minimal research and management, making it a popular choice for many investors. However, it is important to note that tracking an index does not guarantee returns, and the performance of the index may be affected by a variety of factors such as market conditions, economic events, and geopolitical risks.

Benchmarking:

Benchmark is an index that is used to gauge the general effectiveness of a mutual fund. It offers a rough estimate of how much an investment should have made, which may be compared to the actual amount it has made. A mutual fund's goal should ideally be to mirror the value of its benchmark.

The fund houses typically choose the benchmark index for a certain investment. It is regarded as the minimum need for that scheme's return. For smallcap, midcap, and large-cap equity funds in India, a number of different fund institutions provide benchmarking information using indices like CNX Midcap and Smallcap, BSE 200, NIFTY, Sensex, etc.

Importance of Benchmarking

The fluctuation of the financial market affects how well mutual funds function. An established framework for return comparisons is provided by benchmarking in mutual funds; for instance, if an equities fund is benchmarked against the Sensex, its return can be compared to the performance of the Sensex.

While underperforming funds deliver lower returns than their benchmark value, outperforming funds offer better returns than the benchmarking value.

Benchmark indices are chosen by fund houses based on a variety of variables, including the sectoral or theme strategies of the specific investment or even its market capitalization. Small and mid-cap funds are preferable for seasoned investors and people with higher risk appetites, whereas large-cap funds often suit investors with a smaller appetite for risk. The many benchmarking indices that are available for these various funds provide a clear perspective on the performance and portfolio of these funds, enabling an investor to choose the best option given their return expectations.

An investment's tenor should ideally be at least one year in order to be benchmarked for performance. It provides plenty of time to assess the risk connected to the type of stock owning. Additionally, it enables benchmarking tools to evaluate a portfolio's fund allocation, risk profile, and return.

6.3 SUMMARY

- The fund houses typically choose the benchmark index for a certain investment.
- ETFs are similar to index funds, but they trade like individual stocks on an exchange, allowing investors to buy and sell shares throughout the day at market prices.
- An index fund is a type of mutual fund that aims to replicate the performance of a specific index by holding all the securities in the index in the same proportion as their weight in the index.
- Index funds are managed passively and seek to minimize transaction costs and fees by holding a diversified portfolio of securities that closely matches the index they track.
- Spin-offs are another type of corporate action that may require adjustments to the index.
- Indexes can give investors a streamlined view of a sizable market segment without requiring them to look at each and every asset included in the index.

6.4 UNIT END QUESTIONS

A. Descriptive Questions:

Short Answers:

1. How to create an index?
2. What is Indexing?
3. Explain the concept of benchmarking.

4. Differentiate between Indexing and Benchmarking.
5. How Beneficial Are Indexes?

B. Fill in the blanks:

1. Anis a tool for tracking the performance of a collection of assets in a consistent manner.
2. A measure or indicator of anything is called an.....
3. A type of fund management is "indexing."
4. are similar to index funds
5.is an index that is used to gauge the general effectiveness of a mutual fund.

Answers:

1- index, 2- index, 3- passive, 4- ETFs, 5- Benchmark.

6.5 REFERENCES

- Bonus Shares, A Study of the Dividend and Price Effects of Bonus Shares Issues, Bombay, MacMillan, 1973.
- Graham, Benjamin, David, L., Dodd, Sidney Cottle, et al., Security Analysis: Principles and Techniques, 4th ed., New York McGraw – Hill Book Co. Inc., 1962.
- Granger, Clive W and Morgenstem Oskar, Predictability of Stock Market Prices, Lexington, Health Lexington, 1970.
- Granville, Joseph E., A Strategy of Daily Timings for Maximum Profit, Englewood Cliffs, N.J., Prentice-Hall, 1960.
- Gup, Benton E., Basics of Investing, N.Y. Wiley, 1979.
- Gupta L.C., Rates of Return on Equities: The Indian Experience, Bombay, Oxford University Press, 1981.
- Sudhindra Bhat, Security Analysis and Portfolio Management, Excel Books



TECHNICAL ANALYSIS

Unit Structure

7.0 Objectives

7.1 Introduction

7.2 Concept of Technical analysis

7.2.1 Assumptions of Technical Analysis

7.3 Technical vs Fundamental Analysis

7.4 Tools and Techniques of Technical Analysis

7.4.1 Dow Theory

7.4.2 Types of charts

7.5 Technical Indicators

7.6 Summary

7.7 Unit End Questions

7.8 Suggested Readings

7.0 OBJECTIVES

The main purpose of this chapter is–

- To discuss the concept and assumptions of technical analysis
- To understand the difference between Technical and Fundamental analysis
- To explain Tools and Techniques of Technical Analysis
- To understand Dow theory

7.1 INTRODUCTION

There are two primary methods for security analysis: fundamental analysis and technical analysis. Fundamental analysis is typically utilised in combination with technical analysis rather than as a replacement for it. On the basis of examination of the economy, industries, and companies, fundamental analysis makes stock price predictions. With the use of a risk-return framework based on earning potential and the general economic climate, the stock value is assessed. Technical analysis, however, contends that market forces such as supply and demand determine stock prices. It barely bears any relationship to intrinsic worth. A given stock's market price already takes into account all of its financial and market information. Technical analysts have created tools and methods specifically for studying markets. Technical analysts research the technical traits that could be anticipated at major market turning

points and their unbiased evaluation. In order to create certain traits that would aid in identifying significant market tops and bottoms, the historical turning moments are researched. The majority of human behaviours are similar, though not identical, and the technician uses a variety of techniques to try and accurately spot trends and capitalise on them.

7.2 CONCEPT OF TECHNICAL ANALYSIS

"Technical analysis is directed towards predicting the price of a security. The price at which a buyer and seller settle a deal is considered to be the one precise figure which synthesizes, weighs and finally expresses all factors, rational and irrational, quantifiable and non-quantifiable and is the only figure that counts". As a result, technical analysis offers a clear and comprehensive picture of what is occurring to a security's price. It provides a general outline of the entire scenario, much like a shadow or reflection, and it truly functions in real life.

7.2.1 Assumptions of Technical Analysis

There are some basic assumptions underlying the technical analysis. These assumptions are discussed as follows:

1. The combination of factors affecting supply and demand in the market determines a security's market value alone.
2. There are several elements surrounding a security's supply and demand that can be both rational and irrational.
3. Depending on the attitudes, psychology, and emotions of operators or traders, the price of a security moves in trends or waves that can be either upward or downward.
4. Historical trends have an impact on current trends, and research of past pricing trends can help predict future trends.
5. Be prepared for slight fluctuations; stock values typically follow trends that last for a significant amount of time.
6. Anytime there is a change in the demand and supply elements, stock price patterns can change.
7. Charts created specifically to display market activity can be used to spot changes in demand and supply, regardless of when or why they happen.
8. Some chart trends have a propensity to repeat. Price movements are tracked by patterns that are projected by charts, and technical analysis uses existing patterns to predict future patterns.

7.3 TECHNICAL VS FUNDAMENTAL ANALYSIS

The major differences between the technical and fundamental analysis areas follows:

- I. While fundamental research aims to identify long-term values, technical analysis attempts to forecast short-term price changes.
- II. While fundamental research focuses on aspects linked to the economy, industry, and company, technical analysis focuses mostly on internal market data, especially price and volume data.
- III. While long-term investors employ the findings of fundamental analysis, traders who seek to earn rapid money frequently rely on the findings of technical analysis.
- IV. Fundamental analysis is complex, time-consuming, and laborious in nature since it requires gathering and analysing enormous amounts of data. On the other hand, technical analysis is a quick and easy way to predict how stock prices will react.
- V. The technical analyst claims that their approach is preferable than fundamental analysis because the latter is dependent on financial statements, which are vulnerable to a number of flaws such as incomplete disclosure and subjectivity.
- VI. A longer-term strategy is fundamental examination. Even if an analyst finds a security that is out of period, it could take some time for the market to bid its price higher. Fundamental analysis is perceived by technical analysts as being slower and inferior to their own methods and charts.

Therefore, technical and fundamental analysis offer completely different methods for appraisal. However, in practise, it is usually employed to achieve better outcomes to judiciously combine both of these ways.

These two methods are utilised in conjunction with one another rather than as a substitute.

7.4 TOOLS OF TECHNICAL ANALYSIS

There are several methods and tools available for performing technical analysis. Basically, the following four crucial points of view are used to conduct this analysis:

1. Price: Any time a security's price changes, investor sentiment, the demand for and supply of securities also fluctuate.
2. Time: The amount of price fluctuation is a function of time. The magnitude of the price adjustment that follows will increase the longer it takes for a trend to reverse.
3. Volume: A minor change in the volume of transactions indicates that the change is not significant enough. The intensity of price

adjustments is represented in the volume of transactions that are associated with it.

4. **Width:** The extent to which a change in trend extends throughout the majority of sectors and industries—or is concentrated in a small number of securities—is a key indicator of the quality of a price change. Analyzing market size reveals the degree to which pricing adjustments have occurred in the market in accordance with specific broad patterns.

The following technical analysis tools and procedures are explored in relation to the aforementioned dimensions:

7.4.1 DOW THEORY

One of the earliest technical theories that is still commonly used is the Dow Theory, which Charles Dow first proposed in 1900. This theory is where the fundamental ideas of technical analysis come from.

According to Charles Dow "The market is always considered as having three movements, all going at the same time. The first is the narrow movement from day to day. The second is the short swing, running from two weeks to a month or more and third is the main movement, covering at least four years in its duration".

According to the hypothesis, 90% of stock activity is psychological and 10% is logical. Prices vary according to the mood of the market, and the mood can be detected by examining transaction prices and volumes.

The Dow Theory does not attempt to foretell future movements or estimate the extent or duration of such market trends; it just explains the direction of market trends. The hypothesis typically relies on stock behaviour to reflect underlying market trends. As a result, the theory's tenets were tested using market indexes that were created especially to track market developments.

Basic tenets of Dow Theory: The following are the few and simple basic principles of the Dow Theory:

1. Since the index numbers represent the aggregate market activity of thousands of investors and brokers, they discount everything save divine acts. As a result, share prices represent the collective opinion of all stock market participants regarding both the existing and anticipated changes in the demand-supply dynamics of stocks.

2. The term "market" refers to overall price changes for shares as well as primary, secondary, and minor trend swings. The main market trends are represented by primary movements, which can span anywhere from a year to many years. It may be either a bullish (rising) or bearish (falling) trend. Secondary swings in the opposite direction pause periodic movements in the leading trend's direction. The length of the secondary trends typically ranges from a few weeks to a few months. To prevent deviations from the main trend's general bounds, this trend acts as a restraint on it. The daily market fluctuations are the minor trends. Due to

their brief duration and amplitude changes, these have minimal analytical value.

3. The primary trend is upward as long as each subsequent price advance reaches a level higher than the one before it and each secondary reaction, or price decrease, comes to a finish at a level higher than the one before it. This is called a "bull market".

4. The primary trend is downward, and this is referred to as a "bear market" when each intermediate downturn carries prices to gradually lower levels and each intervening recovery fails to get them back up to the peak level of the prior increase.

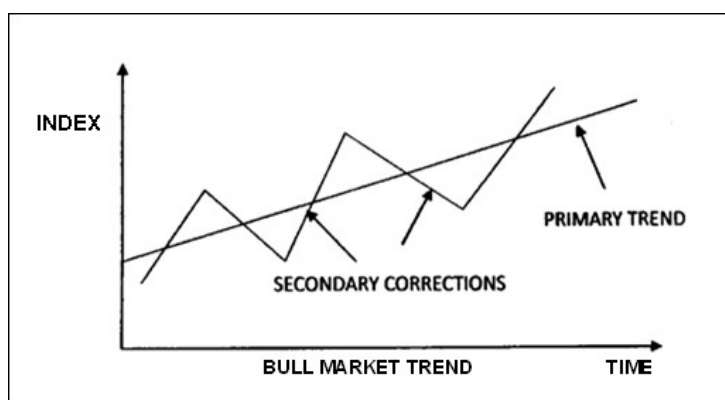
5. The intermediate corrections or dips that take place in bull markets, as well as the intermediate advances or recoveries that take place in bear markets, are considered secondary trends. These often last three weeks to many months and retrace between one-third and two-thirds of the price gain or loss seen during the prior swing, in the main direction.

6. The sporadic changes with a typical duration of six days but infrequently three weeks are known as minor trends. These have no use other than to contribute to secondary trends. The only trend that is theoretically manipulable is this one.

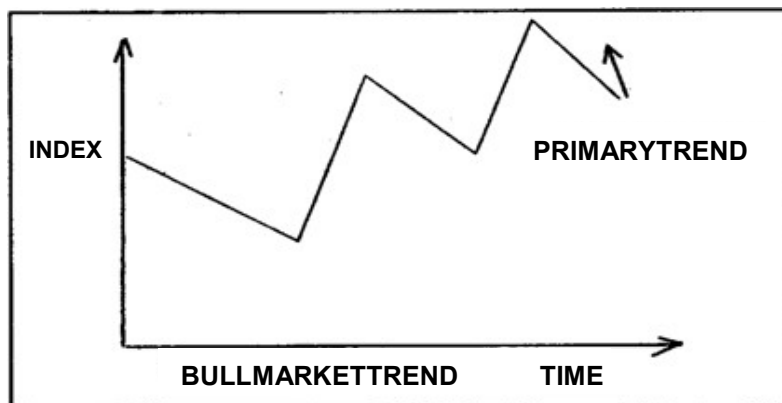
7. Occasionally, a line can take the place of the secondary trend. According to the Dow Theory, a line is a sideways movement that lasts for two to three weeks, or even months, and during which prices change by no more than 5% of their mean values.

8. Until a trend's reversal has been clearly signalled, it should be expected that it will continue. When a secondary reaction of drop carries prices lower than the level registered during the earlier reaction and the succeeding advance fails to carry prices beyond the apex of the prior recovery, this signals the end of a bull market. The end of a bear market is signaled when an intermediate recovery carries prices to a level higher than the one registered in the previous advance and the subsequent decline halts above the level recorded in the earlier reaction.

The following figure gives an example of a bull market trend.



This figure shows a bull market interrupted by reactions. The following figure shows a bear market trend.



This figure shows a bear market interrupted by recoveries.

Dow Theory's Shortcomings: The Dow Theory has been around for a while and is frequently used in technical analysis. The following reasons, however, have led to criticism of the theory:

The Dow Theory predicts one trend change, frequently too late. Only when the nearest intermediate bottom is breached by more than 3% of the level and the succeeding rise fails to raise index prices above the previous high does a bull market come to an end. According to estimates, the theory frequently detects a trend reversal 20 to 25% after a peak or trough has occurred. But then there is no other way of forecasting that the change of trend has taken place at the top and it is better to be late than to be wrong.

Because the Dow Theory depends on interpretation, it is vulnerable to all the risks associated with human interpretation. Experience has demonstrated that the interpretation of the theory is usually where it goes wrong, rather than the theory itself.

7.4.2 Types of charts

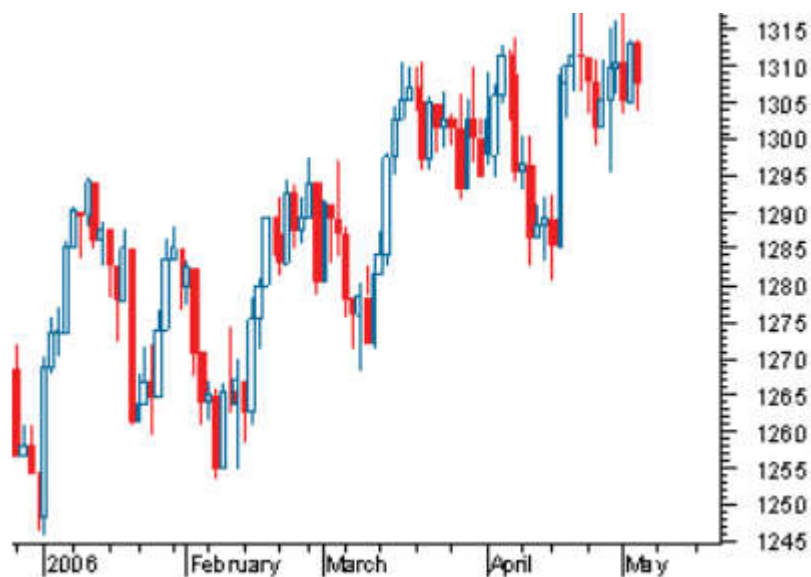
One school of thought led by William L. Jiler developed a comprehensive technique called "Chart Reading". Charts provide visual assistance detecting the emerging and changing patterns and changing patterns of price behaviour.

The core element of chartism is that share prices exhibit patterns over time. These are a mirror of investor behaviour, and it may be assumed that the stock market has a tendency for history to repeat itself. When a given pattern of behaviour reappears in the future, it will probably yield the same results as it did in the past. The different kinds of regularly used charts are:

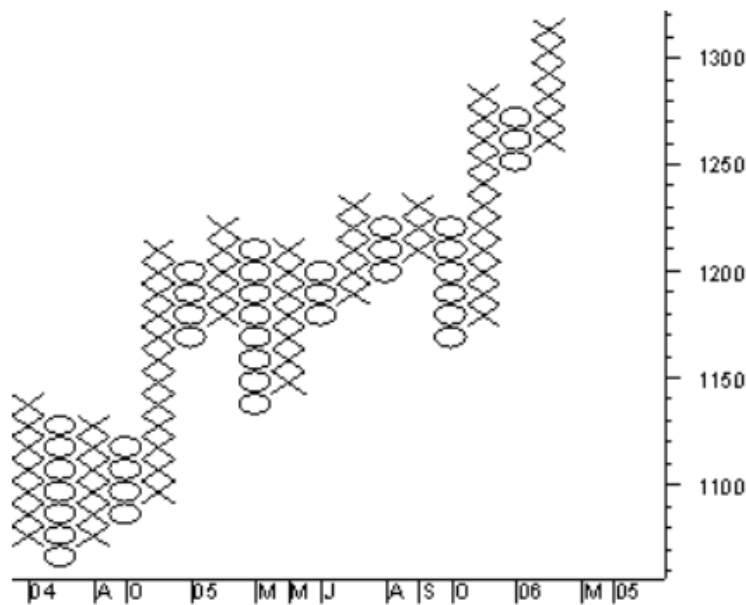
use different standards; therefore, it is important to understand the candlestick configuration used at the chart site you are working with. There are two colour constructs for days up and one for days that the price falls.

When the price of the stock is up and closes above the opening trade, the candlestick will usually be white or clear. If the stock has traded down for the period, then the candlestick will usually be red or black, depending on the site. If the stock's price has closed above the previous day's close but below the day's open, the candlestick will be black or filled with the colour that is used to indicate an up day.

A Candlestick Chart



Point - and - Figure Chart: Bar chartists count on discovering certain buying and selling forces in the market, on the basis of which they predict future price trends. These forces consist of three factors – time, volume and price. Members of another school, known as the point-and-figure chartists, question the usefulness of the first two factors. They argue that the way to predict future price fluctuations is to analyze price changes only. Consequently, they assert, no volume action need be recorded, and the time dimension (day, week, or month) should also be ignored. If only significant price changes are important, then one need only capture the significant (say, one point or more, ignoring all fractions) price changes in a stock, no matter how long it takes for the stock to register this change.



Charts are one of the most fundamental aspects of technical analysis. It is important that you clearly understand what is being shown on a chart and the information that it provides. Now that we have an idea of how charts are constructed.

7.5 TECHNICAL INDICATORS

Indicators and Oscillators

Indicators are calculations based on the price and the volume of a security that measure such things as money flow, trends, volatility and momentum. Indicators are used as a secondary measure to the actual price movements and add additional information to the analysis of securities.

Indicators are used in two main ways: to confirm price movement and the quality of chart patterns, and to form buy and sell signals.

There are two main types of indicators: leading and lagging. A leading indicator precedes price movements, giving them a predictive quality, while a lagging indicator is a confirmation tool because it follows price movement. A leading indicator is thought to be the strongest during periods of sideways or non-trending trading ranges, while the lagging indicators are still useful during trending periods.

Aroon Oscillator

An expansion of the Aroon is the Aroon oscillator, which simply plots the difference between the Aroon up and down lines by subtracting the two lines. This line is then plotted between a range of -100 and 100. The centreline at zero in the oscillator is considered to be a major signal line determining the trend. The higher the value of the oscillator from the centreline point, the more upward strength there is in the security; the

lower the oscillator's value is from the centreline, the more downward the pressure.

Relative Strength Index

The relative strength index (RSI) is another one of the most used and well-known momentum indicators in technical analysis. RSI helps to signal overbought and oversold conditions in a security. The indicator is plotted in a range between zero and 100. A reading above 70 is used to suggest that a security is overbought, while a reading below 30 is used to suggest that it is oversold. This indicator helps traders to identify whether a security's price has been unreasonably pushed to current levels and whether a reversal may be on the way.



Technical Indicators

Most of the technical indicators make sense when examined individually but when one examines many technical indicators simultaneously, the interpretation of their collective meaning is often contradictory and confusing. Once technical analyst issued the following report:

The breadth of the market remains pretty bearish, but the odd-lot index is still in balance and is more bullish than bearish. While the short interest is not bearish, brokers loans are at a dangerously high level. Business indices are beginning to turn sharply upward and most psychological indicators are generally uptrend. The index of 20 low-priced stocks remains in a general upward trend, but the confidence index still is in a long-term downtrend. The Canadian gold price index is still in a downtrend, which normally implies a higher stock market ahead.

Professional and public opinion remains cautiously optimistic, which is also an indication of a higher stock market, but on a decline below 800, the Dow Jones Industrial averages would emit a definite sell signal.

The author of this technical report presented numerous technical indicators that collectively add up to organized confusion. Some of the major technical indicators are described in the following sections. Each indicator makes sense by itself, but interpreting all of them at the same time may yield the same type of confusion found in the passage quoted above.

1. **The Short Interest Ratio Theory:** The short interest ratio is derived by dividing the reported short interest or the number of shares sold short, by the average volume for about 30 days.

When short sales increase relative to total volume, the indicator rises. A ratio above 150% is considered bullish, and a ratio below 100% is considered bearish.

The logic behind this ratio is that speculators and other investor sell stocks at high price in anticipation of buying them back at lower prices. Thus, increasing short selling is viewed as a sign of general market weakness, and short covering (as evidenced by decreasing short positions) as a sign of strength. An existing large short interest is considered a sign of strength, since the cover (buying) is yet to come; whereas an established slight short interest is considered a sign of weakness (more short sales are to come).

2. **Confidence Index:** It is the ratio of a group of lower-grade bonds to a group of higher grade bonds. According to the theory underlying this index, when the ratio is high, investors' confidence is likewise high, as reflected by their purchase of relatively more of the lower-grade securities. When they buy relatively more of the higher-grade securities, this is taken as an indication that confidence is low, and is reflected in a low ratio.

3. **Spreads:** Large spreads between yields indicate low confidence and are bearish; the market appears to require a large compensation for business, financial and inflation risks. Small spreads indicate high confidence and are bullish. In short, the larger the spreads, the lower the ratio and the less the confidence. The smaller the spreads, the greater the ratio, indicating greater confidence.

4. **Advance - Decline ratio:** The index-relating advance to decline is called the advance decline ratio. When advances persistently outnumber declines, the ratio increases. A bullish condition is said to exist, and vice versa. Thus, an advance decline ratio tries to capture the market's underlying strength by taking into account the number of advancing and declining issues.

5. **Market Breadth Index:** The market breadth index is a variant of the advance decline ratio.

To compute it, we take the net difference between the number of stocks rising and the number of stocks falling, added (or subtracted) to the previous.

Example: If in a given week 600 shares advanced, 200 shares declined, and 200 were unchanged, the breadth would be $2[(600-200)/200]$. The figure of each week is added to previous week's figure. These data are then plotted to establish the pattern of movement of advance and declines.

The purpose of the market breadth index is to indicate whether a confirmation of some index has occurred. If both the stock index and the

market breadth index increase, the market is bullish; when the stock index increase but the breadth index does not, the market is bearish.

6. The Odd-Lot Ratio: Odd-lot transactions are measured by odd-lot changes in index. Oddlots are stock transactions of less than, say, 100 shares. The odd-lot ratio is sometimes referred to as a yardstick of uniformed sentiment or an index of contrary opinion because the odd-lot theory assumes that small buyers or sellers are not very bright especially at tops and bottoms when they need to be the brightest. The odd-lot short ratio theory assumes that the odd-lot short sellers are even more likely to be wrong than odd-lotters in general. This indicator relates odd-lot sales to purchases.

7. Insider Transactions: The hypothesis that insider activity may be indicative of future stock prices has received some support in academic literature. Since insiders may have the best picture of how the firm is faring, some believers of technical analysis feel that these inside transactions offer a clue, to future earnings, dividend and stock price performance.

If the insiders are selling heavily, it is considered a bearish indicator and vice versa.

Stockholders do not like to hear that the president of a company is selling large blocks of stock of the company. Although the president's reason for selling the stock may not be related to the future growth of the company, it is still considered bearish as investors figure the president, as an insider, must know something bad about the company that they, as outsiders, do not know.

7.6 SUMMARY

- The term technical analysis is used to mean a fairly wide range of techniques; all based on the concept that past information on prices and trading volume of stocks gives the enlightened investor a picture of what lies ahead.
- It attempts to explain and forecast changes in security prices by studying only the market data rather than information about a company or its prospects, as is done by fundamental analyst.
- Fundamentalists make their decisions on quality, value and depending on their specific investment goals, the yield or growth potential of the security.
- They are concerned with the basis, the corporation's financial strength, record of growth in sales and earnings, profitability, the investment acceptance and so on.

7.7 UNIT END QUESTIONS

A. Descriptive Questions:

1. What is Technical Analysis?
2. Explain the Dow Theory
4. Write note on Type of Charts - Construction of Charts.
5. What are the technical indicators?
6. Explain **The Short Interest Ratio Theory**.

B. Fill in the blanks:

1. Technical analysis is a method of securities by analyzing the statistics generated by market activity, such as past prices and volume.
2. According to Dow, "The market is always considered as having movements, all going at the same time."
3. indicators are used to determine what the main body of stocks is doing.
4. A is the most basic type of chart.
5. The chart is similar to a bar chart, but it differs in the way that it is visually constructed.

Answer:

1. evaluating
2. three
3. Breadth-of-market
4. line chart
5. Candlestick

7.7 SUGGESTED READINGS

- Samuels J.M, F.M. Wilkesard R.E. Brayshaw, Management of Company Finance, Chapman and Hall, London
- Smith, Edger Lawrence, Common Stocks as Long-term Investment, New York, Mac Millan.
- Sprinkel, Beryl, W., Money and Stock Prices, Home wood III, Richard S. Irwin, Inc.
- Sudhindhra Bhatt, Security Analysis and Portfolio Management, Excel Books.
- Fischer, D.E., Security Analysis and Portfolio Management, Prentice Hall, 1983.
- Reilly, F.K., Investment Analysis & Portfolio Management, Drygen Press, 1985.



CAPITAL MARKET THEORIES

Unit Structure

- 8.0 Objectives
- 8.1 Introduction
- 8.2 Introduction to CAPM
- 8.3 Capital Market Line (CML)
- 8.4 Security Market Line (SML)
- 8.5 Risk free lending and borrowings
- 8.6 Benefits and Limitations of CAPM
- 8.7 Portfolio risk and return
- 8.8 Summary
- 8.9 Unit End Questions
- 8.10 Suggested Readings

8.0 OBJECTIVES

The main purpose of this chapter is–

- To understand Capital Market Line (CML)
- To explain Security Market Line (SML)
- To analyse Risk free lending and borrowings
- To discuss benefits and limitations of CAPM
- To understand Portfolio risk and return

8.1 INTRODUCTION

In the previous sections, we saw how measurements of central tendency and measures of variation, such as mean and standard deviation, may be used to describe the risk and return of investments. In truth, statistics are the cornerstone of modern finance, and statistical models have served as the foundation for almost all financial breakthroughs over the last thirty years, collectively referred to as "Modern Portfolio Theory." This makes it important to go through the definition of a statistic and how it pertains to the investing problem. A statistic, in general, is a function that condenses a lot of data into a little quantity of data. For instance, the average represents the typical "location" of a group of numbers as a single number. Statistics ignore a lot because they reduce a lot of information to a few usable values. Prior to the development of current portfolio theory, a fundamental

study of the company, its financial statements, and its dividend policy served as the primary foundation for the decision of whether to include a share in a portfolio. By suggesting that a security's value to an investor might be best assessed by its mean, standard deviation, and correlation to other securities in the portfolio, finance professor Harry Markowitz set off a revolution. This bold proposal amounted to discarding a lot of essential data about the company, including its earnings, dividend policy, capital structure, market, and competitors, in favour of calculating a few basic numbers. In this lesson, we'll follow Markowitz's example and examine where modern portfolio theory technologies can take us.

8.2 INTRODUCTION TO CAPM

The Capital Asset Pricing Model was created by William F. Sharpe and John Linter (CAPM). The portfolio theory created by Harry Markowitz is the foundation of the concept. The model emphasises that systematic risk and unsystematic risk combine to form the risk element in portfolio theory. According to the model, a security's return is inversely proportional to its systematic risk, which cannot be mitigated by diversification. The overall risk is determined by combining the two categories of risks mentioned above. The sum of the market-related variation and the company-specific variance represents the total variance of returns. The CAPM provides a tool for investors to evaluate the effects of a proposed security investment on the total risk and return of the portfolio while also explaining the behaviour of security prices. According to CAPM, the beta coefficient, which measures systematic risk, is used to determine how to price securities so that the risk premium or excess returns are proportional to it. The model is used to analyse the implications of holding securities in terms of risk and return. The term "CAPM" describes the process through which securities are valued in accordance with the expected risks and returns. An investor who is apprehensive about taking risks favours risk-free securities. The danger is higher for a small investor with few securities in his portfolio. He needs to stock his portfolio with well-diversified securities in order to lower the unsystematic risk.

The amount paid for the asset today determines the asset return. When the asset is introduced to the market portfolio, the price paid must guarantee that the asset's risk/return characteristics increase. The CAPM is a model that determines, given the risk-free rate accessible to investors and the risk of the market as a whole, the theoretically needed return (i.e., discount rate) for an asset in a market.

The CAPM is usually expressed:

$$E(R_i) = R_f + i(E(R_m) - R_f)$$

$E(R_m) - (R_f)$ is the market premium, the historically observed excess return of the market over the risk-free rate.

The asset's future cash flows can be discounted to their present value using this rate once the CAPM's expected return, $E(r_i)$, has been computed in

order to determine the asset's proper price. (Once more, the theory assumes that a parameter based on historical data can be paired with an anticipation for the future.)

Less sensitive equities have lower betas and are discounted at lower rates, while riskier stocks have larger betas and are discounted at greater rates. Theoretically, an asset is accurately valued when its observed price is equal to its value as determined by the discount rate computed from the CAPM. The asset is overpriced if the observed price exceeds the valuation; it is undervalued if the price is too low.

Assumptions:

Because the CAPM is a theory, we must assume for argument that:

- The world's assets are all exchanged.
- All assets can be divided indefinitely.
- The whole global investment community holds all assets.
- There is a lender for each borrower.
- The globe has risk-free security.
- All lenders and borrowers use the riskless rate.
- Everyone concurs on the Mean-STD picture's inputs.
- Simple utility functions do a good job of describing preferences.
- Security distributions are normal, or at the very least, two parameters adequately describe them.
- In our world, there are only two distinct time periods.

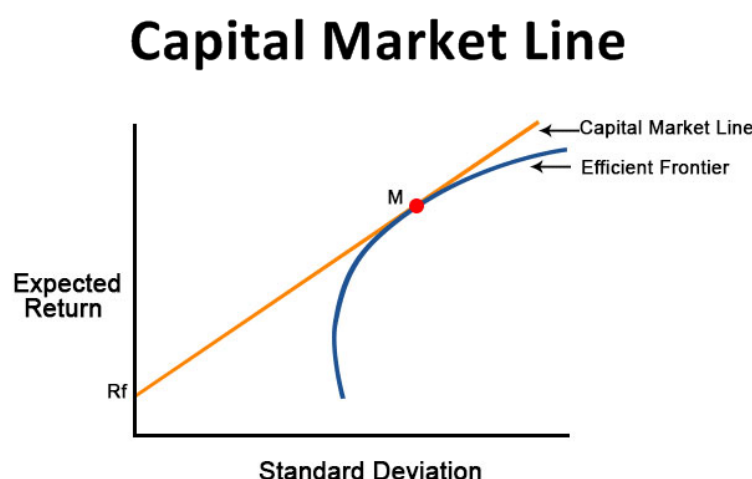
These conditions make up a lengthy list that collectively sum up the ideal society for capitalists. Even human capital can be purchased and sold in perfectly liquid fractional amounts! For investors who are afraid of taking risks, the riskless asset is the ideal, secure sanctuary. This implies that everyone poses an equivalent risk to creditors. In the domain of CAPM, nobody has an informational advantage. There are no disagreements over predicted returns because everyone has kindly provided all of their knowledge regarding the potential risk and return of the securities. Every customer preference is public knowledge. Using a straightforward utility function, risk attitudes are well defined. The distribution of future return amounts is clearly defined. Last but not least, the flexibility to modify your opinion later on does not complicate decisions. You make an irrevocable investment at one moment, profit from it in the following period, and then the investment issue vanishes. At that time, terminal wealth is calculated; the winner is the person who dies with the most toys! "A frictionless one-period, multi-asset economy with no asymmetric information" is the formal name for this situation.

Investment Implications: According to the CAPM, every investor will desire to hold "capitalweighted" portfolios of the world's wealth. When the CAPM was created in the 1960s, this approach resembled a portfolio that was already well-known to many people: the S&P 500. The majority of the largest stocks in the US are included in the capital-weighted S&P 500. The US was the largest market in the world at the time, so it appeared to

be a reasonable approximation of the "cake." Surprisingly, the solution was right in front of us; the tangency portfolio must resemble the S&P 500. It's no coincidence that index funds started to be used extensively around this period. Mutual funds and/or money managers who manage index funds merely replicate the S&P's performance. The benefits of indexing were realised by numerous organisations and individuals. Capital-weighted portfolios automatically adjust to changes in value when stocks grow, so investors need not constantly change their weights — it is a "buy-and-hold" portfolio. As a result, trading costs were minimal under this method. Additionally, there wasn't much proof that active portfolio management outperformed the S&P index at the time, so why not?

8.3 CAPITAL MARKET LINE

The optimal risk-return trade-off is provided by the graph of the needed return and risk (as determined by standard deviation) of a portfolio that consists of a risk-free asset and a collection of risky assets.



It is assumed that all investors have the same (homogeneous) expectations. As a result, they will all encounter the same efficient frontier. According to his preferred level of risk, each investor will attempt to mix the same risky portfolio with various levels of loan or borrowing. Since every investor owns the same dangerous portfolio, it will contain every risky security available on the market. The market portfolio M is the name given to this collection of all hazardous securities. Each security will be held in the proportion which the market value of the security bears to the total market value of all risky securities in the market. All investors will hold combinations of only two assets, the market portfolio and a riskless security. All these combinations will lie along the straight line representing the efficient frontier.

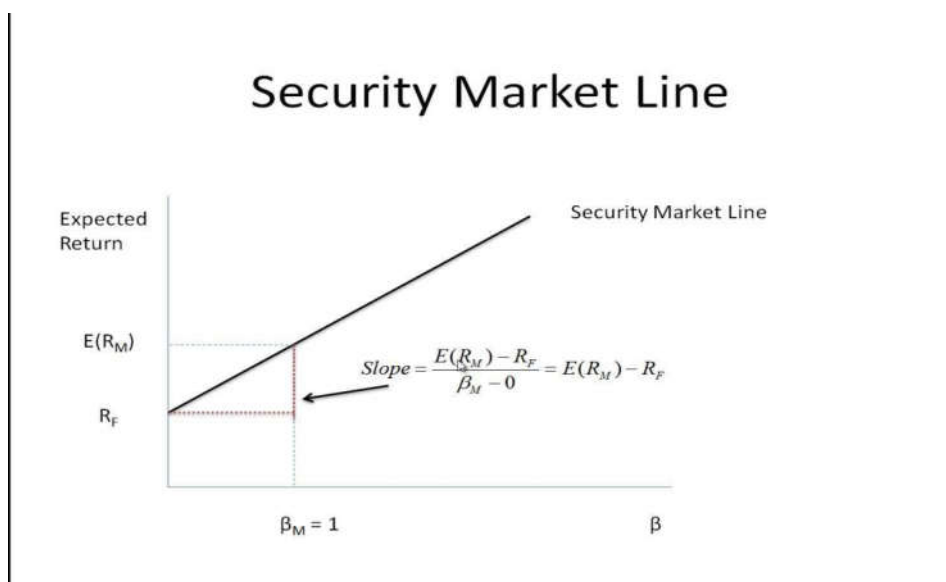
The capital market line is the result of all investors combining their market portfolios with risk-free assets (CML). This capital market line will be followed by all investors' efficient portfolios as a whole.

For effective portfolios, the CML offers a risk return relationship and a risk measure. The portfolio's standard deviation of return serves as the proper risk indicator for an effective portfolio. For these effective portfolios, there is a linear relationship between the expected return and the standard deviation-based measure of risk.

For all effective portfolios, CML displays the link between risk and return. The capital market line would be where they all lay. Except for efficient portfolios, all other portfolios will be below the capital market line. The risk-return connection of inefficient portfolios or individual stocks is not covered by the CML.

8.4 SECURITY MARKET LINE

It is a line drawn on a chart that acts as a graphical depiction of the Capital Asset Pricing Model (CAPM), which contrasts distinct marketable assets' levels of systematic risk (also known as market risk) with the projected return of the entire market at a certain period.



For all securities and portfolios, whether efficient or inefficient, the Capital Asset Pricing Model describes the connection between expected return and risk. Systematic risk and unsystematic risk, or diversifiable risk, make up the entire risk of an investment as determined by standard deviation. The unsystematic risk is decreased as an investment's diversification increases and a portfolio's number of securities increases. Unsystematic risk typically decreases to zero for highly well diversified portfolios, leaving only systematic risk, as measured by beta, as the important risk. Therefore, it is maintained that beta is the proper indicator of a security's risk. The predicted return of a securities or a portfolio should, therefore, be correlated with the risk of that security or portfolio as defined by beta, which is a measure of the security's sensitivity to fluctuations in market return.

A beta value more than one suggests increased market sensitivity, whilst a beta value less than one indicates decreased market sensitivity. A value of one means that the security moves in perfect sync with the market, both in terms of speed and direction.

It's important to compare SML and CML. Both assume that risk and return have a linear (straight line) relationship.

1. In SML, the risk is defined as systematic risk and measured by beta, but in CML, the risk is defined as total risk and quantified by standard deviation.
2. The security market line is applicable for all portfolios and individual securities, whereas the capital market line is only valid for efficient portfolios.
3. SML is the foundation of Capital Asset Theory, whereas CML is the foundation of Capital Market Theory.

8.5 RISK FREE LENDING AND BORROWINGS

Systematic risk (B), projected market return, and risk-free rate are the three variables covered by CAPM. Of the three parameters, the risk free rate receives the least attention. In CAPM, it is only used twice. The risk premium is initially determined using it as a minimum rate of return R_f . Any inaccuracy in calculating the risk-free rate of return would consequently result in an incorrect calculation of the expected rate of return for an asset or portfolio. By selecting the incorrect risk-free rate, the analyst would have inadequate information with which to generate forecasts or a faulty understanding of the sources of the asset's returns and performance.

The risk-free asset is one of the investor's two options according to CAPM theory. By adding more risk-free assets to the portfolio, the investor can lower portfolio risk. Conversely, he can raise portfolio risk by reducing the position of risk-free assets or by borrowing money at a risk-free rate to make new investments. The rate that will actually persuade investors to select between current or future consumption, savings or investment is the risk-free rate. The cost of time or the risk-free rate of return is what must be paid to persuade an investor to forego present consumption in exchange for a specific future sum, or to forego liquidity.

James Tobin's proposed separation theorem The CAPM, which claims that investors choose their portfolios exclusively based on risk and return, separating that choice from all other criteria, is insufficient since it ignores other significant aspects. In order to reach a personally preferred overall combination of risk and return, it is expected that each investor will distribute his assets among risky securities in the same relative proportion and add risk-free borrowing or lending. Independent of the investor's preference for risk vs return, every portfolio contains a risky component. This is justified by the fact that each investor's portfolio's riskier assets are simply outside of either axis. Even if the investor invests nothing in these

assets, their prices will progressively fall, increasing their projected returns, until a non-zero share of the resulting tangency portfolio is connected with them. Everything will balance out in the end. The market will be brought into balance once all price manipulating has ceased.

8.6 BENEFITS AND LIMITATIONS OF CAPM

Benefits

Eliminates Unsystematic Risk

A diversified portfolio, similar to a market portfolio, is what the CAPM model assumes the investor has. Unsystematic (specific) risk is eliminated by diversifying your holdings.

Systematic Risk

Other return models, such as the dividend discount model, do not take systematic risk into account. Market risk, often referred to as systematic risk, is a significant factor because it is unpredictable and frequently cannot be avoided because it is not completely anticipated.

Investment Appraisal

Comparing the CAPM to other rates, an investor might use it to evaluate an investment because it provides a higher discount rate. This model makes a strong connection between systematic risk & needed return.

Ease of Use

Simple calculations like the CAPM can be quickly stressed-tested to generate a range of potential outcomes. These results give assurance regarding the necessary rate of returns.

Limitations of CAPM

Too Many Assumptions

Many criticise the CAPM model for being unrealistic since it relies on too many assumptions. As a result, it might not produce accurate findings.

Assigning Values to CAPM Variables

The yield on short-term government securities is the usually accepted rate that is used as the risk-free rate (R_f). The yield fluctuates daily, which causes volatility, which is a concern when using this input.

ROI (Return on the Market): The average capital gain plus the typical dividend yield add up to the return on a stock market. In a short-term market, the return on the market may be negative. The long-term market return is therefore used. The fact that these returns are retrograde and not forward-looking is the other significant negative.

Beta (B): For all listed companies, beta values are routinely disclosed on all stock exchanges. Because the value of beta is not constant but varies over time, there is uncertainty in the projected return value in this situation.

Capital market theories

Ability to Borrow at Risk-free Rate

The CAPM makes four main assumptions. One of the underlying presumptions is that investors would be able to borrow and lend money at risk-free rates. This presumption does not reflect reality. It is impossible for private investors to borrow or lend money at the same rate as the US government.

As a result, the predicted return determined by the CAPM model may not be accurate in this case.

Determination of Project Proxy Beta

The issue could appear while determining a project-specific discount rate utilising the CAPM. Equity beta and portfolio/investment beta are typically not the same. The company must therefore locate a proxy beta for the project.

Finding a reliable proxy beta, however, may be challenging and have an impact on the outcome's dependability.

8.7 PORTFOLIO RISK AND RETURN

Capital market theory, a branch of financial economics that aims to explain the behaviour of financial markets and the pricing of financial assets, is based on two fundamental ideas: portfolio risk and return. The expected return on their investments and the amount of risk they are exposed to are investors' two main concerns, according to capital market theory.

A key idea in capital market theory is the risk-return tradeoff, which contends that investors seek larger profits in exchange for taking on greater amounts of risk. In other words, investors will only accept increased risk if it results in a bigger expected return.

The capital market theory also acknowledges that by spreading out their investments among a variety of different assets, investors can lower their overall risk. Although still generating a comparable level of return to a more concentrated portfolio, investors can lessen the impact of idiosyncratic or company-specific risks by keeping a diversified portfolio.

Another key idea in capital market theory is the efficient market hypothesis, which contends that financial markets are effective and that prices swiftly adapt to take into account all available information. If financial markets are genuinely efficient, it might be challenging for investors to continuously use stock picking or market timing tactics to generate larger returns than the market average.

8.8 SUMMARY

- John Linter and William F. Sharpe developed the Capital Asset Pricing Model (CAPM). The portfolio theory created by Harry Markowitz is the foundation of the concept. The model emphasises that systematic risk and unsystematic risk combine to form the risk element in portfolio theory.
- According to the model, a security's return is inversely proportional to its systematic risk, which cannot be mitigated by diversification.
- The overall risk is determined by combining the two categories of risks mentioned above.
- Market-related variation plus company-specific variance equals the total variance of returns.
- The CAPM provides a tool for investors to evaluate the effects of a proposed security investment on the total risk and return of the portfolio while also explaining the behaviour of security prices.
- The CAPM model is used to analyse the risk-return implications of holding assets, and it proposes that the prices of securities are set in a way that the risk premium or excess returns are proportional to systematic risk, which is reflected by the beta coefficient.
- The term "CAPM" describes the process through which securities are valued in accordance with the expected risks and returns.
- According to CAPM, the beta coefficient, which measures systematic risk, is used to determine how to price securities so that the risk premium or excess returns are proportional to it.
- The model is used to analyse the implications of holding securities in terms of risk and return.

A. Descriptive Questions:

1. What is Risk free lending and borrowings?
2. Write note on Capital Market Line.
3. Explain Security Market Line
4. What do you analyse as the benefits and limitations of CAPM?
5. Do you believe that the CAPM's included and are reasonable? why or why not?
6. Discuss the difference between CML and SML.

B. Fill in the blanks:

1. Theis one of the investor's two options according to CAPM theory.
2. The CAPM makesmain assumptions.
3.and William F. Sharpe developed the Capital Asset Pricing Model (CAPM).
4. The expresses the basic theme of the CAPM.
5. The CAPM is a theoretical solution to the identity of the portfolio.

Answer:

1. risk-free asset
2. four
3. John Linter
4. Security Market Line (SML)
5. tangency

8.10 SUGGESTED READINGS

- Samuels J.M, F.M. Wilkesard R.E. Brayshaw, Management of Company Finance, Chapmanand Flail, London
- Smith, Edger Lawrence, Common Stocks as Long-term Investment, New York, Mac Millan.
- Sprinkel, Beryl, W., Money and Stock Prices, Homewood III, Richard S. Irwin, Inc.
- Sudhindhra Bhatt, Security Analysis and Portfolio Management, Excel Books.
- Fischer, D.E., Security Analysis and Portfolio Management, Prentice Hall, 1983.
- Reilly, F.K., Investment Analysis & Portfolio Management, Drygen Press, 1985.



FACTOR MODELS AND ARBITRAGE PRICING THEORY

Unit Structure

- 9.0 Objectives
- 9.1 Introduction
- 9.2 Arbitrage pricing theory
 - 9.2.1 Assumptions of APT
 - 9.2.2 Arbitrage in Economics and Finance
 - 9.2.3 Conditions for Arbitrage
- 9.3 Factor Models
- 9.4 Summary
- 9.5 Unit End Questions
- 9.6 Suggested Readings

9.0 OBJECTIVES

The main purpose of this chapter is—

- To discuss Arbitrage pricing theory
- To discuss the assumptions of APT
- To explain the conditions for arbitrage
- To understand Factor Models

9.1 INTRODUCTION

The general theory of asset pricing known as the arbitrage pricing theory (APT) in finance has a significant impact on share prices. According to the APT, the expected return of a financial asset can be predicted as a linear function of multiple macroeconomic variables or hypothetical market indexes, with the sensitivity to changes in each variable being represented by a factor-specific beta coefficient. The asset will then be priced accurately using the model-derived rate of return; the asset price should be equal to the anticipated end-of-period price discounted at the model-implied rate. Arbitrage should bring the price back into line if it starts to diverge. The economist Stephen Ross developed the hypothesis in 1976.

The CAPM and the Arbitrage Pricing Model (APM) have very similar appearances, however the APM's history is fundamentally different. The CAPM is a single-factor model, but the APM is a multifactor model with a collection of beta values—one for each factor—rather than simply a single beta value. The expected return on an investment is based on both how

that investment responds to a set of specific macroeconomic factors (the level of response being measured by the betas) and the risk premium associated with each of those macroeconomic factors, according to arbitrage pricing theory, from which the APM originates. According to Ross's APM, which he created in 1976, there are four components that explain the relationship between a security's risk and risk premium.

9.2 ARBITRAGE PRICING THEORY

Arbitrage Pricing Theory (APT) is an alternate version of Capital Asset Pricing Model (CAPM). This theory, like CAPM provides investors with estimated required rate of return on risky securities. APT considers risk premium basis specified set of factors in addition to the correlation of the price of the asset with expected excess return on the market portfolio. As per assumptions under Arbitrage Pricing Theory, return on an asset is dependent on various macro-economic factors like inflation, exchange rates, market indices, production measures, market sentiments, changes in interest rates, movement of yield curves etc.

The Arbitrage pricing theory based model aims to do away with the limitations of one-factor model (CAPM) that different stocks will have different sensitivities to different market factors which may be totally different from any other stock under observation. In layman terms, one can say that not all stocks can be assumed to react to single and same parameter always and hence the need to take multifactor and their sensitivities.

Calculating Expected Rate of Return of an Asset Using Arbitrage Pricing Theory (APT)

Arbitrage Pricing Theory Formula – $E(x) = r_f + b_1 * (\text{factor } 1) + b_2 * (\text{factor } 2) + \dots + b_n * (\text{factor } n)$

Where,

E(X) = Expected rate of return on the risky asset

R_f = Risk-free interest rate or the interest rate that is expected from a risk-free asset

(Most commonly used in U.S. Treasury bills for U.S.)

B = Sensitivity of the stock with respect to the factor; also referred to as beta factor 1, 2 ...

N = Risk premium associated with respective factor

As the formula shows, the expected return on the asset/stock is a form of linear regression taking into consideration many factors that can affect the price of the asset and the degree to which it can affect it i.e. the asset's sensitivity to those factors.

If one is able to identify a single factor which singly affects the price, the CAPM model shall be sufficient. If there are more than one factor affecting the price of the asset/stock, one will have to work with a two-factor model or a multi-factor model depending on the number of factors that affect the stock price movement for the company.

The APT is a substitute for the Capital Asset Pricing Model (CAPM) in that both assert a linear relation between assets' expected returns and their covariance with other random variables. (In the CAPM, the covariance is with the market portfolio's return.) The covariance is interpreted as a measure of risk that investors cannot avoid by diversification. The slope coefficient in the linear relation between the expected returns and the covariance is interpreted as a risk premium. Such a relation is closely tied to mean-variance efficiency

ARBITRAGE PRICING THEORY ASSUMPTIONS

- The theory is based on the principle of capital market efficiency and hence assumes all market participants trade with the intention of profit maximisation
- It assumes no arbitrage exists and if it occurs participants will engage to benefit out of it and bring back the market to equilibrium levels.
- It assumes markets are frictionless, i.e. there are no transaction costs, no taxes, short selling is possible and an infinite number of securities is available.

ARBITRAGE PRICING THEORY BENEFITS

- APT model is a multi-factor model. So, the expected return is calculated taking into account various factors and their sensitivities that might affect the stock price movement. Thus, it allows selection of factors that affect the stock price largely and specifically.
- APT model is based on arbitrage free pricing or market equilibrium assumptions which to a certain extent result in a fair expectation of the rate of return on the risky asset.
- APT based multi-factor model places emphasis on the covariance between asset returns and exogenous factors, unlike CAPM. CAPM places emphasis on the covariance between asset returns and endogenous factors.
- APT model works better in multi-period cases as against CAPM which is suitable for single period cases only.
- APT can be applied to the cost of capital and capital budgeting decisions.

- The APT model does not require any assumption about the empirical distribution of the asset returns, unlike CAPM which assumes that stock returns follow a normal distribution and thus APT a less restrictive model.

9.3 FACTOR MODELS

Single Factor Model

The Capital Asset Pricing Model is the model's most popular application (CAPM).

The relationship between systematic risk and the anticipated return on equities is clearly communicated by the CAPM model. Based on the risk assessment, it determines the required return. This is accomplished by using a risk multiplier known as the Beta coefficient (β).

Formula/structure

$$E(R)_i = R_f + \beta(E(R_m) - R_f)$$

Where $E(R)_i$ is the Expected return of investment

- The Risk-Free Rate of Return, or R_f , is a hypothetical rate of return with no hazards.
- The investment's beta, which compares the volatility of the investment to the market as a whole, β
- $E(R_m)$ represents the market's anticipated return.

The Market Risk Premium is denoted by $E(R_m) - R_f$.

The most popular model in finance is the CAPM, which is a straightforward design. The Weighted Average Cost of Capital/Cost of Equity is determined using this.

However, this model is predicated on a few slightly implausible premises, including the notion that "the riskier the investment, the higher the return," which may not hold true in all scenarios, and the notion that historical data accurately predicts the future performance of the asset or stocks, among other things.

What if the rate of return is determined by a number of variables rather than simply one? As a result, we continue on to the financial models and explore them in detail.

Multiple Factor Model

The additions to one financial model are multiple factor models. One of its most common uses is in the area of arbitrage pricing theory.

$$R_{s,t} = R_f + \alpha + \beta_1 \times F_{1,t} + \beta_2 \times F_{2,t} + \beta_3 \times F_{3,t} + \dots \dots \beta_n \times F_{n,t} + \epsilon$$

Where $R_{s,t}$ is the Return of security s at Time t

- R_f is the Risk-Free Rate of Return
- α is the security's Alpha; Alpha is the factor model's constant term. It stands for the investment's excess return when compared to the benchmark index's return. The margin by which the investment outperforms the index is the measure of this. For investors, the higher the alpha, the better.
- $F_{1,t}$, $F_{2,t}$, $F_{3,t}$ are the factors – macroeconomic parameters including the GDP, foreign institutional investors, inflation rate, and exchange rate. P/E ratio, market capitalisation, and other fundamental variables.
- β_1 , β_2 , β_3 are the factor loadings. – The coefficients of the factors, as previously mentioned, are what are referred to as factor loadings or component loadings. For instance, the beta calculation helps investors assess the degree to which a stock fluctuates in proportion to market change.
- $\tilde{E}$ indicates the error term - The error term in the equation is utilised to increase the calculation's accuracy. It can occasionally be used to describe the investor-accessible security-specific news..

The following presumptions form the foundation of the arbitrage pricing theory, one of the popular categories of financial models:

- Asset returns can be described by a linear component model.
- Diversification may help to eliminate asset- or company-specific risk.
- There are no more opportunities for arbitrage.

9.4 SUMMARY

- The fundamental idea of the CAPM is embodied in the Security Market Line (SML), which states that the expected return of a security rises linearly with risk evaluated with "beta." The SML is a straight line with an increasing slope that passes through the market portfolio and an intercept at the risk-free return securities.
- The efficiency barrier, known as the "Capital Market Line," which results from the assumption that the risk-free lending and borrowing rates are the same, leads to some crucial implications (CML).
- A sane investor would refrain from buying an asset if it did not enhance the risk-return characteristics of his current holdings.
- The questioned item will be included in the market portfolio since a sensible investor would own it. In this situation, MPT determines the necessary return for a correctly priced asset.
- The vertical intercept point of the regression line is given by the alpha coefficient.

- Modern portfolio theory is said to have its foundations in Harry Markowitz.
- He claims that risk and return, the two characteristics of an asset that matter most to investors, may be traded off through portfolio diversification.
- The core of his idea is that an investor doesn't really care about the risk of a certain asset.

Factor models and arbitrage pricing theory

9.5 UNIT END QUESTIONS

A. Descriptive Questions:

1. What are your uses for the APT as an investor?
2. What is Single Factor model?
3. Discuss the Assumptions of APT
4. Analyze the Arbitrage Pricing Model critically.
5. Explain Arbitrage in Economics and Finance.
6. Discuss the various types of factor model.

B. Fill in the blanks:

1. The APT differs from the CAPM in that it is in its assumptions.
2. models are used to construct portfolios with certain characteristics, such as risk, or to track indexes.
3. Portfolio management is concerned with efficient management of in the securities.
4. based its assumptions on a "factor model" of asset returns.
5. The additions to one financial model are factor models..

Answer:

1. less restrictive
2. multi factor
3. investment
4. APT
5. multiple

9.6 SUGGESTED READINGS

- Bonus Shares, A Study of the Dividend and Price Effects of Bonus Shares Issues, Bombay, MacMillan, 1973.
- Graham, Benjamin, David, L., Dodd, Sidney Cottle, et al., Security Analysis: Principles and Techniques, 4th ed., New York McGraw – Hill Book Co. Inc., 1962.
- Granger, Clive W and Morgenstem Oskar, Predictability of Stock Market Prices, Lexington, Health Lexington, 1970.
- Granville, Joseph E., A Strategy of Daily Timings for Maximum Profit, Englewood Cliffs, N.J., Prentice-Hall, 1960.
- Gup, Benton E., Basics of Investing, N.Y. Wiley, 1979.
- Gupta L.C., Rates of Return on Equities: The Indian Experience, Bombay, Oxford University Press, 1981.
- Sudhindra Bhat, Security Analysis and Portfolio Management, Excel Books



INVESTMENT DECISION THEORY

Unit Structure

10.0 Learning Objectives

10.1 Introduction

10.2 Investment decision theory

10.3 Summary

10.4 Unit End Questions

10.5 References

10.0 LEARNING OBJECTIVES

After studying this unit, you will be able to:

- To illustrate Investment decision theory
- To understand Modern Portfolio Theory
- To discuss Behavioral finance
- To describe Capital Asset Pricing Model

10.1 INTRODUCTION

Investment decision theory is a framework that helps investors make informed decisions about how to allocate their resources to different investment opportunities. The theory is based on the principle that investors should make decisions based on the expected returns and risks associated with different investments.

The basic premise of investment decision theory is that investors should aim to maximize their expected returns while minimizing their risks. To do this, they need to consider a range of factors, including the expected returns and risks of different investments, the correlation between different assets, and their own risk tolerance.

10.2 INVESTMENT DECISION THEORY

One of the key concepts in investment decision theory is the idea of portfolio diversification. This involves spreading investments across a range of different asset classes and investment opportunities in order to reduce the overall risk of the portfolio. By diversifying their portfolio, investors can reduce the impact of any one investment performing poorly, while also increasing the potential for positive returns.

Another important concept in investment decision theory is the idea of the efficient frontier. This is the set of portfolios that offer the highest expected returns for a given level of risk. By constructing a portfolio that lies on the efficient frontier, investors can maximize their expected returns while minimizing their overall risk.

The best way to understand how investment decisions are made is as an integrated process to which security analysis uniquely contributes. The definition of objectives and the evaluation of success in portfolio management call for the consistent use of economic, capital market, and sector analyses. Security analysis assists the investor by pointing out the undervalued or properly valued assets that are most likely to deliver the desired outcomes.

The following goals serve as the foundation for developing investment policies and asset allocation strategies:

1. To continuously preserve the purchasing power of its assets, adjusted for inflation, and to generate a satisfactory "real" rate of return.
2. To minimise portfolio risk and volatility while maintaining sufficient spending stability from year to year.

There are several key theories that are important in security analysis and portfolio management, including:

- **Modern Portfolio Theory:** Developed by Harry Markowitz, this theory emphasizes the importance of diversification in reducing portfolio risk. According to this theory, investors should focus on creating portfolios that are diversified across multiple asset classes to minimize risk.
- **Behavioral Finance:** This theory combines principles of psychology with finance to explain why people make certain investment decisions. It suggests that investors are often influenced by emotions and biases, and that these factors can lead to irrational investment decisions.
- **Capital Asset Pricing Model:** This theory attempts to quantify the relationship between risk and expected returns. It suggests that investors should expect higher returns from riskier investments, and that the riskier the investment, the greater the potential reward.

Modern Portfolio Theory (MPT)

Modern Portfolio Theory (MPT) is a framework for managing investment portfolios that was developed by Harry Markowitz in the 1950s. MPT is based on the principle that investors can minimize risk and maximize returns by creating a diversified portfolio of assets.

The MPT makes the assumption that investors are logical and risk-averse, i.e., they want to maximise profits while limiting risk. Systematic risk and unsystematic risk are the two different categories of risk, according to MPT. Unsystematic risk is the risk that is unique to a certain asset or

company, whereas systematic risk is the risk that is inherent in the market as a whole. Investment decision theory

MPT argues that portfolio diversification across various assets can help investors lower their unsystematic risk. Investors can lessen the effect of any one asset's performance on the portfolio as a whole by holding a mix of assets. Also, MPT advises that rather than concentrating on the characteristics of individual assets, investors should concentrate on the overall risk and return characteristics of the portfolio.

The efficient frontier, which is the collection of ideal portfolios that provide the best projected return for a specific degree of risk, was another idea developed by MPT. The efficient frontier is based on the notion that diversifying an investor's portfolio can boost returns without increasing risk.

Critics of MPT contend that certain assumptions, including as the notion that investors are rational and that historical data may forecast future performances, may not hold true in the actual world.

Behavioral finance

To better understand how human behaviour affects financial decisions and market results, the field of research known as "behavioural finance" blends financial theory with psychological concepts. It investigates how biases, emotions, and cognitive mistakes affect how people make financial decisions.

According to behavioural finance, people don't always act logically while making financial decisions. Psychological biases including over confidence, loss aversion, and herding tendencies may have an impact on them. These biases can cause individuals to make illogical decisions and have an impact on market results, leading to inefficiencies that smart investors can take advantage of.

Prospect theory, a fundamental idea in behavioural finance, contends that people are more sensitive to losses than gains. As a result, even if the prospective returns are modest, individuals could be willing to take on additional risk to prevent losses. This may result in overly conservative or aggressive portfolio management techniques.

The disposition effect, which reflects investors' propensity to sell winning investments too soon and hold onto losing investments for an excessively lengthy period of time, is another crucial idea in behavioural finance. Reduced returns and subpar portfolio performance may result from this.

Behavioral finance has implications for investors and financial professionals. By understanding the impact of psychological biases on financial decision-making, investors can make more informed decisions and avoid common pitfalls. Financial professionals can also use this knowledge to design investment products and strategies that take into account the psychological biases of investors.

The Capital Asset Pricing Model (CAPM)

A popular financial model for calculating projected returns on investments based on risk is the capital asset pricing model (CAPM). The required rate of return that an investor should anticipate receiving on a specific investment is calculated using the CAPM.

The foundation of CAPM is the concept that there are two different types of investment risk: systematic risk and unsystematic risk. Unsystematic risk is a risk that is unique to a certain business or industry, whereas systematic risk is a risk that is inherent in the entire market.

According to CAPM, three variables—the risk-free rate, the market risk premium, and the investment's beta—determine the expected return on an investment. The return on a risk-free investment, like a Treasury bond issued by the United States, is known as the risk-free rate. The increased return that investors anticipate receiving in exchange for accepting market risk is known as the market risk premium. Last but not least, the investment's beta measures how sensitive it is to market risk; a beta greater than 1 denotes a higher level of market risk, while a beta less than 1 denotes a lower level of market risk.

CAPM suggests that the expected return on an investment can be calculated using the following formula:

$$\text{Expected Return} = \text{Risk-Free Rate} + \text{Beta} \times (\text{Market Risk Premium})$$

Investors and financial experts frequently use CAPM to calculate the required rate of return for an investment and assess the performance of investment portfolios. However, detractors of CAPM contend that it is based on a number of oversimplifying presumptions that could not hold true in actuality, including the concepts that investors are logical and markets are efficient.

10.3 SUMMARY

- Investment decision theory is a framework that helps investors make informed decisions about how to allocate their resources to different investment opportunities.
- MPT is based on the principle that investors can minimize risk and maximize returns by creating a diversified portfolio of assets.
- MPT provides a framework for investors to create diversified portfolios that minimize risk and maximize returns.
- Behavioral finance suggests that individuals do not always behave rationally when making financial decisions.
- CAPM is based on the principle that there are two types of risk associated with an investment: systematic risk and unsystematic risk.

10.4 UNIT END QUESTIONS

A. Descriptive Questions

1. Write note on Investment theory.
2. Explain The Capital Asset Pricing Model.
3. Discuss Behavioral finance approach.
4. Analyse Modern Portfolio Theory (MPT).

B. Fill in the Blanks

1. Modern Portfolio Theory was developed by
2. According tofinance, people don't always act logically while making financial decisions.
3. CAPM stands for
4. Beta measures how sensitive is to market risk.
5. Investors and financial experts frequently use to calculate the required rate of return for an investment and assess the performance of investment portfolios.

Answers

- 1-Harry Markowitz
- 2-behavioural,
- 3-Capital Asset Pricing Model,
- 4-investment,
- 5- CAPM

10.5 REFERENCES

References book

- *Derivatives Market* NCFM Module. National Stock Exchange India Limited Publications: Bombay: 2007.
- GuptaS. L(2007). *Financial Derivatives* Prentice Hall. New Delhi.
- *Indian Stock Market Review*.National Stock Exchange Publications.
- Jaynath Rama Varma (2008). *Derivatives and Risk Management*. Tata McGraw Hill Publications: New Delhi.



PORTFOLIO THEORY

Unit Structure

11.0 Learning Objectives

11.1 Introduction

11.2 Portfolio theory Construction and analysis

11.3 Portfolio optimization

11.4 Portfolio management strategies

11.5 Portfolio performance measurement.

11.6 Summary

11.7 Unit End Questions

11.8 References

11.0 LEARNING OBJECTIVES

After studying this unit, you will be able to:

- To discuss Portfolio theory Construction and analysis
- To explain Portfolio optimization
- To understand Portfolio management strategies
- To describe Portfolio performance measurement

11.1 INTRODUCTION

A portfolio is a collection of financial speculations, including closed-end assets and trade-exchanged assets, securities, goods, money, and money equivalents (ETFs). Most people agree that stocks, bonds, and cash constitute the core of a portfolio. Despite the fact that this is frequently the case, it shouldn't be the norm. A portfolio could include a variety of assets, including as real estate, handiwork, and unorganized businesses.

The understanding of enhancement, which essentially means not to tie up your assets in one spot, is one of the key concepts for portfolio executives. Expansion spreads bets throughout many business initiatives, financial instruments, and classes in an effort to reduce risk. It refers to increasing returns by investing in a variety of areas that would all react differently to the same situation. There are many methods for growing. It's up to you how you decide to go about doing it. Your future goals, your appetite for

risk, and your character are all important considerations when deciding how to build your portfolio.

A speculative portfolio might be compared to a pie that has been cut into pieces, each of which has a different wedge-shaped size and addresses a different resource class or prospective type of endeavour. Financial supporters anticipate creating a globally diversified portfolio to achieve a risk return portfolio designation that is appropriate for their level of risk resistance.

Despite the fact that money, stocks, and bonds are the main building blocks of a portfolio, you can diversify your holdings by adding a variety of assets, such as real estate, gold stocks, various types of securities, pieces of art, and other artisanal treasures.

The definition of a portfolio states that it is a collection of various resources that have financial backers. The aforementioned range of financial resources may also consist of assets such as gold, equities, reserves, subordinated debt, real estate, cash analogues, bonds, and so forth. People invest their money in such resources in order to generate income while ensuring that the resource's initial worth remains intact.

11.2 PORTFOLIO THEORY CONSTRUCTION AND ANALYSIS

The Dow Theory and Elliot Wave Theory

One of the earliest and most well-known technical instruments is the Dow Theory. Charles Dow, who established the Dow Jones organisation and served as The Wall Street Journal's editor, is credited with creating it. In 1902, Charles Dow went away.

W.P. Hamilton and Robert Rhea derived the Dow Theory from an editorial that Dow wrote between 1900 and 1902. The original Dow Theory has been modified, expanded upon, and in some cases abbreviated by numerous authors. It serves as the foundation for a variety of additional technical analyst techniques.

The Great Crash of 1929 is seen as having been predicted by the Dow Theory. The Wall Street Journal's still-famous editorial "A Twin in the Tide," which was published on October 23, 1929, accurately predicted that the bull market had ended and that a bear market had begun. The Dow Theory received a lot of positive attention after the terrible market meltdown that followed the projection. The Dow Theory, according to Greiner and Whitecombe, "provides a time-tested approach of reading the stock market barometer."

There are many variations of this theory, but in general it describes three different types of market movements: the major trend, which frequently lasts for a year or longer; the secondary intermediate trend; which can move counter to the primary trend for one to several months; and the

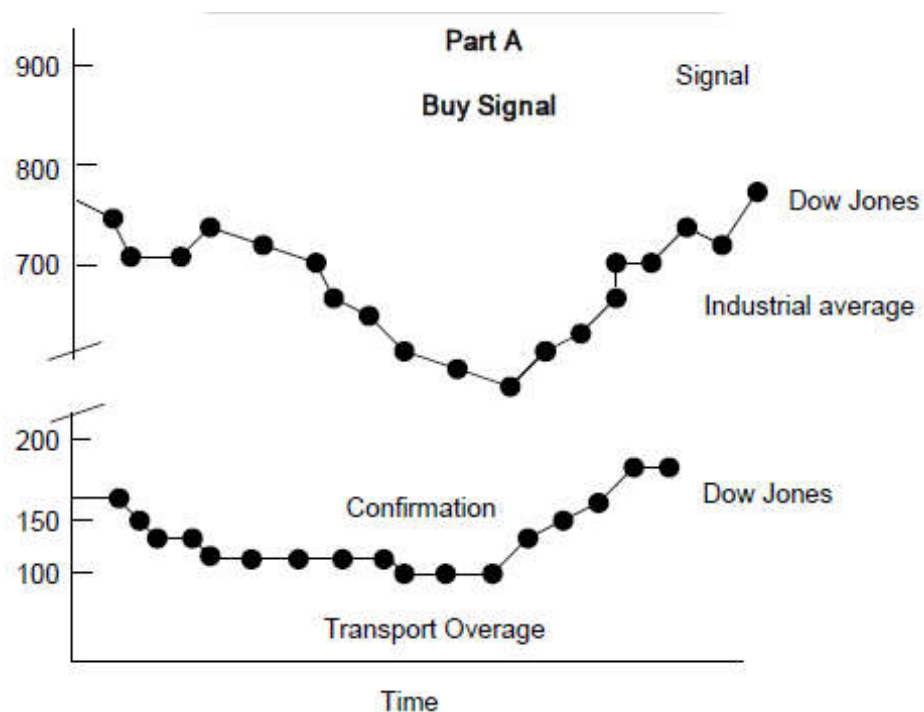
minor movements, which only last for a few hours to a few days. The most crucial choice for a Dow believer is identifying the main market trend.

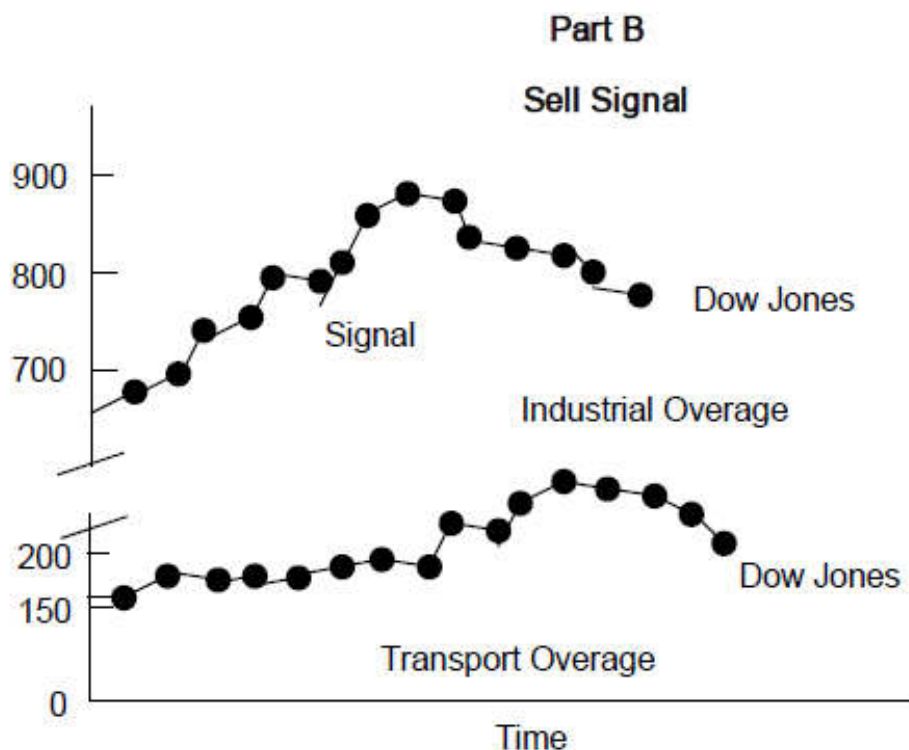
The Theory: According to Dow, "The market is always considered as having three movements, all going at the same time. The first is the narrow movement from day-to-day. The second is the short swing running from two weeks to a month or more, the third is the main movement covering at least four years in duration".

These movements are called:

1. Daily fluctuations (minor trends)
2. Secondary movements (trends), and
3. Primary trends

The long-term cycle that drives the entire market up or down is the main trend (bull or bear markets). The secondary trend restrains the primary trend in some way. It comes to an end to remedy departures from its overall parameters. Due to their brief existence and amplitude changes, the small trends are of little analytical use. The Dow Theory is represented in Figure 4.1.





The Dow Jones Averages

The Dow Theory is built upon the assertion that measures of stock prices tend to move together.

It employs two of the Dow Jones' averages.

1. Dow-Jones Transportation Average (DJTA)
2. Dow-Jones Transportation Average (DJTA)

Bear market – If both the averages are rising

Bear market – If both the averages are falling

Uncertain – If one is rising and other is falling

Charles Dow was an advocate of basic analysis, but today the Dow Theory is mostly a technical approach to the stock market. It claims that stock prices exhibit patterns over a period of four to five years, and that stock price indices reflect these patterns. The industrial average and the transportation average are two of the Dow Jones averages used in the Dow Theory. In most cases, the utility average is disregarded.

The Dow Theory is based on the idea that stock price measures frequently move in tandem.

The transportation average should increase if the Dow Jones industrial average is. Such synchronous price changes are indicative of a robust bull market. The market is unsure of the direction of future stock prices when both the industrial and transportation averages decrease and move in different ways.

The two are at odds if one of the averages begins to fall after a period of rising stock prices. For instance, the transportation average may be declining while the industrial average is rising. This means that instead of continuing to grow, the industries may soon start to decline.

To sell assets and convert to cash, the market investor will therefore act on this indication.

The opposite happens when, following a stretch of declining security prices, one of the averages begins to rise while the other keeps decreasing. This divergence signals that this phase is gone and that securities prices generally will soon begin to climb, in accordance with the Dow Theory. Next, the wise investor will buy securities in anticipation of a rise in price.

The Elliott Wave theory

Ralph Nelson Elliott created the Elliott Wave theory in the 1930s. Elliott needed something to do with his time after being forced into retirement owing to a medical condition, so he started analysing 75 years' worth of annual, monthly, weekly, daily, and self-made hourly and 30-minute charts across numerous indices.

In 1935, Elliott produced an extraordinary prediction of the stock market bottom, which helped the theory become well-known. Since then, it has evolved into a standard for tens of thousands of traders, private investors, and portfolio managers.

Elliott provided detailed guidelines for how to recognise, foresee, and profit from these wave patterns. R.N. Elliott's Masterworks, which was released in 1994, covers these books, articles, and letters. The largest independent financial analysis and market forecasting company in the world, Elliott Wave International, bases its market analysis and projections on Elliott's model.

He took care to point out that these patterns help to organise the probability for future market activity rather than offering any type of assurance regarding future price movement.

1 To pinpoint specific opportunities, they can be utilised in conjunction with other types of technical analysis, such as technical indicators. Different traders may perceive the Elliott Wave structure of a market differently at any particular time.

How Elliott Waves Work

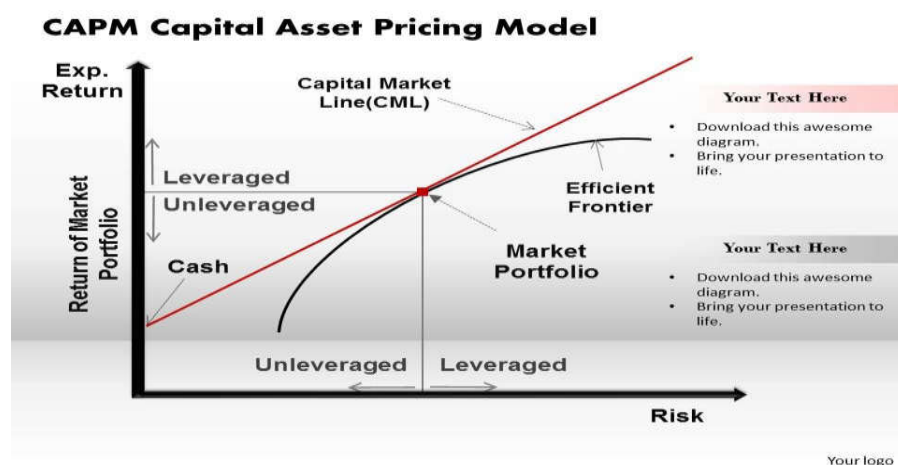
Using the Elliott Wave Theory, some technical analysts attempt to make money from stock market wave patterns. According to this theory, changes in stock prices may be forecast because they follow recurring up-and-down patterns known as waves, which are influenced by investor psychology or mood.

According to the theory, waves can be divided into two categories: motive waves (sometimes called impulse waves) and corrective waves. Because it

is subjective, not all traders will understand the theory in the same manner or concur that using it as a trading technique is a good idea.

Capital asset pricing model (CAPM)

The CAPM makes the assumption that investors have completely diversified holdings. By assuming that investors demand a return on an investment based solely on its systematic risk rather than its overall risk, the CAPM assumes that investors do. Therefore, the "beta" risk metric utilised in the CAPM is a measure of systematic risk.



Capital Asset Pricing Model

The capital asset pricing model offers a method that determines a security's expected return depending on risk. The difference between the return on the market and the risk-free rate multiplied by the risk-free rate plus beta is the formula for the capital asset pricing model.

Risk and the Capital Asset Pricing Model Formula

Understanding investment risk is necessary to comprehend the capital asset pricing model. Individual securities are subject to the risk of depreciation, which would result in an investor losing their investment. Some assets carry more risk than others, therefore an investor may anticipate a larger return on investment when taking on more risk. Consider the scenario where a person has \$100 and two acquaintances want to borrow it. Both of them are giving a 5% return (\$105) after a year. The obvious decision would be to lend to the person who is more likely to pay back the loan, or who has a lower default risk. The risk associated with securities can be thought of in the same way.

The capital asset pricing model with beta takes into consideration the risk inherent in assessing a certain stock. In the context of the capital asset pricing model formula, beta is a measure of the risk associated with buying a particular stock in comparison to market risk. The market's beta would be 1.

Inversely, a security with a beta of .5 would have less risk than the market and one with a beta of 1.5 would be proportionally riskier than the market.

Risk Free Rate in the Capital Asset Pricing Model Formula

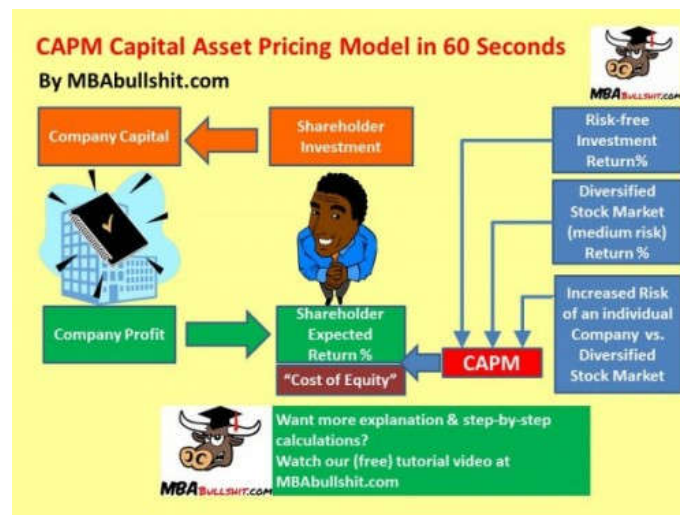
The projected rate on an investment that is presumptively risk-free is known as the risk-free rate. Since the US Treasury bill rate is short-term and relies on a fiat currency, it is frequently used for the country. If the US Treasury bill rate were to collapse, it would conceivably cause a significant enough disruption to make it difficult to estimate value or, worse, the entire monetary system.

Risk Premium in the Capital Asset Pricing Model Formula

The capital asset pricing model formula can be broken up into two components: the risk-free rate and the risk premium of the particular security.

$$\text{Expected Return} = r_f + \underbrace{\beta(r_m - r_f)}_{\text{risk premium}}$$

The difference between the market return and a risk-free return multiplied by beta is the risk premium. The risk of the entire market can then be calculated using the capital asset pricing model formula by deducting the market return from a risk-free return. The risk of a certain stock can therefore be calculated by multiplying beta by the market risk. The risk associated with a specific security in relation to the market is known as beta. A beta of two would make the market twice as hazardous. In real life, risk and volatility are the same thing. A stock with a beta greater than the market beta of 1 will often grow more than the market when the market is up and decrease more than the market when the market is down.



Capital Asset Pricing Model

Alternative Capital Asset Pricing Model Formula

$$\text{Expected Return} = \alpha + \beta(r_m - r_f) + \epsilon$$

The formula will appear as above when regression analysis is used to the capital asset pricing model based on prior returns. Epsilon is regarded as the regression error, whereas alpha is regarded as the risk-free rate.

When the actual return equals the expected return, there is absolutely no danger that the investment's return will deviate from the expected return, which is the minimal amount of return demanded by investors. The term "risk-free rate of return" refers to this minimal rate of return.

The formula for the CAPM, which is included in the Paper F9 formulae sheet, is as follows:

$$E(r_i) = R_f + \beta_i(E(r_m) - R_f)$$

$E(r_i)$ = return required on financial asset i

R_f = risk-free rate of return

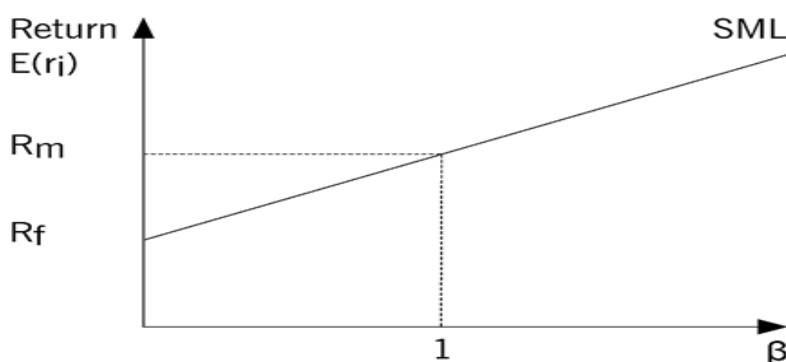
β_i = beta value for financial asset i

$E(r_m)$ = average return on the capital market

This formula expresses the required return on a financial asset as the sum of the risk-free rate of return and a risk premium – $\beta_i (E(r_m) - R_f)$ – which compensates the investor for the systematic risk of the financial asset. If shares are being considered, $E(r_m)$ is the required return of equity investors, usually referred to as the 'cost of equity'.

The formula is that of a straight line, $y = a + bx$, with β_i as the independent variable, R_f as the intercept with the y axis, $(E(r_m) - R_f)$ as the slope of the line, and $E(r_i)$ as the values being plotted on the straight line. The line itself is called the security market line (SML), as shown in Figure 1.

FIGURE 1: THE SECURITY MARKET LINE



The Security Market Lin

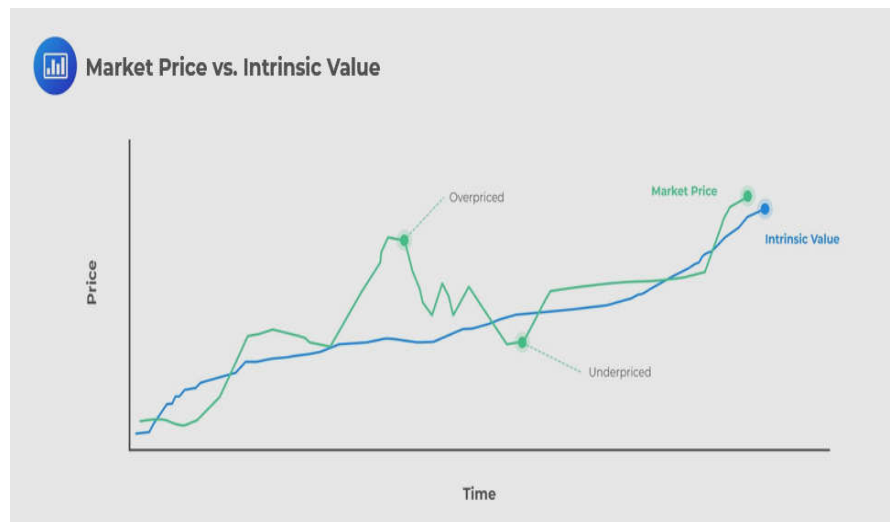
Over-pricing and under-pricing securities

Proper pricing is one of the largest obstacles your business will encounter, regardless of what you sell. You need a pricing strategy that works for your target demographic, but you don't want it to be excessively high or

low. Some profitable businesses, like Amazon, have a competitive edge thanks to a smart pricing strategy that takes into account customer and competition behaviour. Although it can seem preferable to underprice your good or service, you will do better if you overcharge.

A security is deemed to be fairly valued when its current market price is roughly comparable to its value estimate. The security is overvalued when the market price exceeds the value estimate, while the security is undervalued when the market price is less than the anticipated value.

Uncertainties arise when determining an estimated valuation for a company, of course. Since a discovered mispricing may indicate a mistake in the analyst's valuation rather than the market's valuation, market prices should be handled with caution but also with respect.



Market Price vs. Intrinsic Value

Arbitrage pricing theory (APT)

An alternative to the Capital Asset Pricing Model is called Arbitrage Pricing Theory (APT) (CAPM). The projected needed rate of return on hazardous securities is provided to investors by this theory, similar to the CAPM. APT takes into account the risk premium based on a predetermined set of variables in addition to the relationship between asset price and expected excess return on the market portfolio. According to the underlying assumptions of the arbitrage pricing theory, an asset's return is influenced by a variety of macroeconomic variables, including inflation, currency rates, stock market indices, production metrics, market mood, changes in interest rates, movement of yield curves, etc.

The one-factor model (CAPM) has the limitation that different stocks will have varied sensitivities to different market conditions, which may be completely different from any other stock under observation. The arbitrage pricing theory-based approach seeks to overcome this issue. In layman's words, it can be said that not all stocks can be expected to consistently respond to a single, consistent criterion, necessitating the consideration of multiple factors and their sensitivities.

Calculating Expected Rate of Return of an Asset Using Arbitrage Pricing Theory (APT)

Arbitrage Pricing Theory Formula – $E(x) = r_f + b_1 * (\text{factor } 1) + b_2 * (\text{factor } 2) + \dots + b_n * (\text{factor } n)$

Where,

E(X) = Expected rate of return on the risky asset

R_f = Risk-free interest rate or the interest rate that is expected from a risk-free asset

(Most commonly used in U.S. Treasury bills for U.S.)

B = Sensitivity of the stock with respect to the factor; also referred to as beta factor 1, 2 ...

N = Risk premium associated with respective factor

As the formula shows, the expected return on the asset/stock is a form of linear regression taking into consideration many factors that can affect the price of the asset and the degree to which it can affect it i.e. the asset's sensitivity to those factors.

The CAPM model should be enough if one can pinpoint a single component that alone influences price. Depending on how many variables are influencing the price of the asset or stock, one must use a two-factor model or a multi-factor model to predict how the stock price will move for the company.

The Capital Asset Pricing Model (CAPM) and the Asset Pricing Theory (APT) both state a linear relationship between the expected returns on an asset and its covariance with other random variables. (In the CAPM, the covariance relates to the return of the market portfolio.) The covariance is seen as a gauge of risk that diversification cannot shield investors against.

The slope coefficient in the linear relation between the expected returns and the covariance is interpreted as a risk premium. Such a relation is closely tied to mean-variance efficiency.

Arbitrage pricing theory assumptions

- The theory is based on the principle of capital market efficiency and hence assumes all market participants trade with the intention of profit maximization
- It assumes no arbitrage exists and if it occurs participants will engage to benefit out of it and bring back the market to equilibrium levels.

- It assumes markets are frictionless, i.e. there are no transaction costs, no taxes, short selling is possible and an infinite number of securities is available.

Arbitrage pricing theory benefits

- APT model is a multi-factor model. So, the expected return is calculated considering various factors and their sensitivities that might affect the stock price movement. Thus, it allows selection of factors that affect the stock price largely and specifically.
- APT model is based on arbitrage free pricing or market equilibrium assumptions which to a certain extent result in a fair expectation of the rate of return on the risky asset.
- APT based multi-factor model places emphasis on the covariance between asset returns and exogenous factors, unlike CAPM. CAPM places emphasis on the covariance between asset returns and endogenous factors.
- APT model works better in multi-period cases as against CAPM which is suitable for single period cases only.
- APT can be applied to the cost of capital and capital budgeting decisions.
- The APT model does not require any assumption about the empirical distribution of the asset returns, unlike CAPM which assumes that stock returns follow a normal distribution and thus APT a less restrictive model.

Arbitrage pricing theory limitations

- The model necessitates a concise summary of the variables affecting the stock under examination. Finding and naming every aspect might be challenging, and there is a chance that some will be missed. Additionally, there is a chance that unintentional correlations will occur, which could turn a component into a significant influence provider or the opposite.
- It will be necessary to calculate the expected returns for each of these components, which, depending on the factor's nature, may or may not always be readily available. The model calls for calculating each factor's sensitivities, which can be laborious and may not be realistically viable.
- The factors that affect the stock price for a particular stock may change over a period of time. Moreover, the sensitivities associated may also undergo shifts which need to be continuously monitored making it very difficult to calculate and maintain.

The Arbitrage Pricing theory, often known as APT, was created to address some of the shortcomings of CAPM that we covered at the conclusion of

the previous session. In particular, the CAPM only functions when we make illogical assumptions about consumer preferences: Markowitz and Sharpe defined that customers only care about the mean and standard deviations of their wealth if their preferences are quadratic. Returns must also be regularly distributed, or Gaussian. People hold a variety of views, and most crucially, these beliefs influence how they invest their money.

As a result, it is unclear what the market portfolio exactly is. In reality, we would use something like the S&P 500, but that is not the best option. The CAPM depicts a world where β is king, but as investors hold various portfolios, the value of β shifts. You get a different answer for β if you measure the market portfolio in a different way (for example, by using a different broad index of stocks and shares). APT was created to address these shortcomings. When developing APT, Ross (1976) did away with the assumptions of preferences and rigorous maximisation. He persisted in his belief that businesses and stocks seek for opportunities to maximise profits and that the market was challenging to outperform. Ross simply assumed that the pursuit of arbitrage would keep investors at or near the CAPM-derived equilibrium rather than developing an equilibrium condition for the market from consumer preferences as Sharpe did. The main concept behind APT is to consider the asset pairings that one would hold to rule out any potential for arbitrage. When two assets with the same risk have varying returns, arbitrage is feasible.

You can short the low return asset, go long on the other using the proceeds of the sale of the first, and in theory, reap infinite rewards with no risk to yourself.

How to use APT

To use APT, you'll need to follow these steps:

1. Identify the factors
2. Estimate the factor weights on each asset
3. Estimate the factor premia.

We'll take these in turn.

First, we have to find the factors. Candidates are things like

1. Changes in gdp growth,
2. Changes in the T-bill yield as a proxy for inflation
3. Changes in the yield spread between bills and bonds of interest,
4. Changes in the default premium of some corporate bonds,
5. Changes in oil prices, again as a proxy for inflation and so on

Use factor analysis:

1. Calculate the asset returns' covariance, and then use that information to extract the "factors" from the covariance matrix. Utilize data mining to investigate various portfolio combinations using a computer in order to identify those whose returns can be considered as factors.
2. Factor Weights Regress historical asset prices on the factors to calculate factor weights.
3. Premia Factor. You are aware of the important considerations and are aware of how much importance each asset deserves. The creation of a factor portfolio is now easy. Just use the formula above to plug one into the other.

Strength and Weaknesses of APT

1. The model gives a reasonable description of return and risk.
2. Factors seem plausible.
3. No need to measure market portfolio correctly.
4. Model itself does not say what the right factors are.
5. Factors can change over time.
6. Estimating multi-factor models requires more data.

The Law of one price, two factor arbitrage pricing

According to the economic principle known as the law of one price, when certain conditions are taken into account, the price of an identical good or service will be the same everywhere, irrespective of location.

The law of one price takes into account a market that is free from friction, meaning there are no transaction expenses, transportation costs, or legal constraints, that currency exchange rates are constant, and that neither buyers nor sellers are manipulating prices. Because of the arbitrage possibility, discrepancies in asset pricing across different regions would eventually be eliminated, thus the law of one price.

By buying the asset in the market where it is accessible at a cheaper price and selling it in the market where it is available at a higher price, the arbitrage opportunity would be realised. Prices for the asset would eventually align due to forces of market equilibrium.

The cornerstone of buying power parity is the law of one price. According to the concept of purchasing power parity, two currencies are equivalent in value when a basket of identical items is priced the same in both nations. It makes certain that customers have the same purchasing power in all international markets.

Due to varying trading expenses and certain people's incapacity to access markets, purchasing power parity is very challenging to attain.

It is possible to use the buying power parity calculation to compare prices on markets where multiple currencies are traded. The method can be updated periodically to uncover mispricings across multiple foreign markets because currency rates might fluctuate frequently.

Example of the Law of One Price

After taking into account the effects of currency exchange rates, if the price of any economic good or security is inconsistent across two separate free markets, an arbitrageur will buy the asset in the cheaper market and sell it in the more expensive market to make a profit.

When the law of one price is in effect, arbitrage gains like these will continue until prices in all markets converge.

For example, if a particular security is available for \$10 in Market A but is selling for the equivalent of \$20 in Market B, investors could purchase the security in Market A and immediately sell it for \$20 in Market B, netting a profit of \$10 without any true risk or shifting of the markets.

All other things being equal, prices on both markets should alter in accordance with variations in supply and demand as securities from Market A are sold on Market B.

Market A, which is generally less expensive, should see an increase in the price of these assets due to increased demand.

In contrast, greater supply in Market B, where the security is being sold by the arbitrageur for a profit, ought to cause a drop in its price. This would eventually result in a price equilibrium between the security's two markets, bringing it back to the situation suggested by the law of one price.

An alternative to the Capital Asset Pricing Model is called Arbitrage Pricing Theory (APT) (CAPM). Similar to CAPM, this theory gives investors a projected necessary rate of return on risky securities. APT takes into account the risk premium based on a predetermined set of variables in addition to the relationship between asset price and expected excess return on the market portfolio.

According to the underlying assumptions of the arbitrage pricing theory, an asset's return is influenced by a number of macroeconomic variables, including inflation, currency rates, stock market indices, production metrics, market mood, changes in interest rates, movement of yield curves, etc.

The one-factor model (CAPM) has the limitation that different stocks will have varied sensitivities to different market conditions, which may be completely different from any other stock under observation. The arbitrage pricing theory-based approach seeks to overcome this issue. In layman's words, it can be said that not all stocks can be expected to consistently

respond to a single, consistent criterion, necessitating the consideration of multiple factors and their sensitivities.

Equilibrium risk-return relations

When economic forces are in balance, there is said to be an economic equilibrium. In the absence coming from external influences, economic variables essentially hold true to their equilibrium levels. Market equilibrium and economic equilibrium are two different concepts.

Economic equilibrium is the set of economic variables (often price and quantity) that the economy is driven towards by standard economic processes like supply and demand.

The term economic equilibrium can also be applied to any number of variables such as interest rates or aggregate consumption spending. The point of equilibrium represents a theoretical state of rest where all economic transactions that “should” occur, given the initial state of all relevant economic variables, have taken place.

- Economic equilibrium is a condition where market forces are balanced, a concept borrowed from physical sciences, where observable physical forces can balance each other.
- The incentives faced by buyers and sellers in a market, communicated through current prices and quantities drive them to offer higher or lower prices and quantities that move the economy toward equilibrium.
- Economic equilibrium is a theoretical construct only. The market never actually reach equilibrium, though it is constantly moving toward equilibrium.

Economic Equilibrium in the Real World

- Due to the frequently changing and ambiguous conditions that underlie supply and demand, equilibrium is basically a theoretical concept that may never be realised in an economy. Every key economic variable undergoes continuous modification. By shooting a dart at a dartboard that is randomly and unpredictable altering in size and shape while the board and the thrower are both careening around independently on a roller rink, one can actually achieve economic equilibrium. Without ever fully achieving it, the economy strives towards equilibrium.
- Entrepreneurs engage in competitive activity across the economy, utilising their judgement to make educated assumptions about the optimal mixtures of items, prices, and volumes to acquire and sell. Through the process of earnings, entrepreneurs are in fact rewarded for bringing the economy closer to equilibrium since a market economy rewards those who make better predictions. Over time, entrepreneurs have more access to knowledge about the pertinent economic conditions of supply and demand thanks to the growth of the business and financial media, pricing circulars

and advertising, consumer and market research, and the development of information technology.

This combination of market incentives that select for better guesses about economic conditions and the increasing availability of better economic information to educate those guesses accelerates the economy toward the “correct” equilibrium values of prices and quantities for all the various goods and services that are produced, bought, and sold.

11.3 PORTFOLIO OPTIMIZATION

The Sharpe ratio, which gauges the excess return gained for each unit of risk taken, is stated to be highest for an ideal portfolio.

Modern Portfolio Theory provides the foundation for portfolio optimization (MPT). The MPT is founded on the idea that investors want the best possible return at the lowest possible risk. Assets in a portfolio should be chosen with this goal in mind; specifically, they should have a low correlation with each other. Any MPT-based optimal portfolio is well-diversified to prevent a crash when a certain asset or asset class performs poorly.

Process of Optimal Portfolio

Asset Allocation for an optimal portfolio is essentially a two-part process:

1. **Selecting Asset Classes** – Portfolio managers pick the weight of each asset class included after first selecting the asset classes to which they intend to allocate funds. The most popular asset classes are stocks, bonds, gold, and real estate.
2. **Selecting Assets within Class** – The manager chooses which asset classes to invest in before determining how much of a specific stock or bond to put in the portfolio. The risk-return relationship of an efficient portfolio is depicted on a graph by the Efficient Frontier. An effective portfolio is represented by each point on this curve.

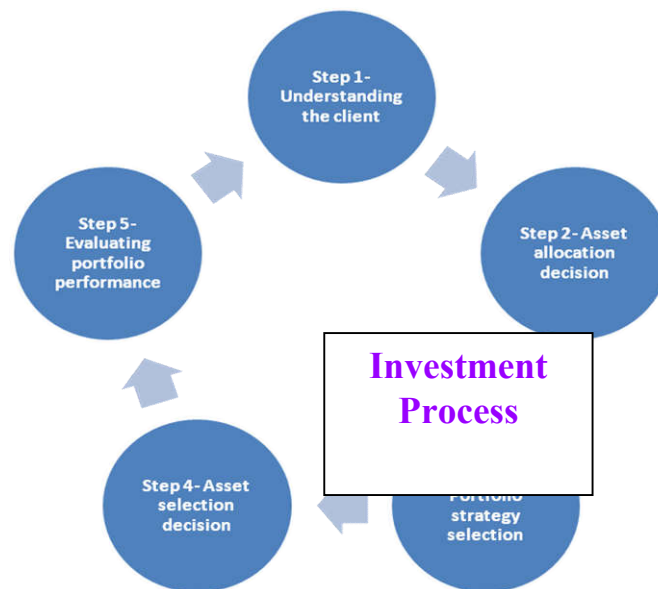
11.4 PORTFOLIO MANAGEMENT STRATEGIES

There are Two Types of Portfolio Strategy

1. Active Management
2. Passive Management

Dynamic portfolio the board interaction alludes to a system where the goal of contributing is to surpass the market return contrasted with a specific benchmark by either purchasing undervalued protections or by short selling overvalued protections. Both risk and reward are substantial in this treatment. The asset administrator or financial backer must give careful thought to this proactive method.

The CEOs cycle in the aloft portfolio speaks to a methodology whose goal is to achieve recoveries that are comparable to those of the market. It is a responsive method since the asset manager or financial backer responds after the reaction of the market.



Understanding the Investment Process

Think about the process involved in constructing a custom home. You wouldn't begin by installing partitions or selecting paint colours. Starting with an outline that reflects your desired outcome. Fostering the diagram forces you to make specific decisions to ensure the house you build is in line with your needs and goals. These decisions include the type of establishment (section, unfinished basement, or storm cellar), the number of floors, rooms, and bathrooms you desire, where the front door, kitchen, and windows will be, etc. Once the diagram is complete, you have a solid plan and impression to build upon when carrying out your arrangement.

During the development cycle you might make a few changes, yet you have a general structure to continue in obliging any changes and working out your vision.

When your house is fabricated, it will require normal consideration, support and refreshing. Afterward, you might need to roll out certain improvements, adding a screen patio or open air kitchen, or rebuilding certain rooms to mirror your changing necessities or current plan patterns. A solid establishment and strong development will give more prominent adaptability in obliging these progressions not too far off.

The cycle of speculation is comparable. Think about your venture portfolio, which is where your wealth will likely reside and maybe grow. It must reflect the goals and needs of the present while still being flexible enough to accommodate future developments. Regardless of whether you design and implement your own cycle of speculation or work with a

financial expert or firm, a few strategies are essential to pursuing the results you seek. Unquestionably, the speculating interaction consists of four key developments:

- **Goal Setting** – The first step in the speculation cycle is understanding and developing specific financial goals. Here is where you construct your speculation diagram. If you're working with a Wealth Advisor, they can help you identify and concentrate on your goals. The more information you provide about your current financial situation, goals, lifestyle objectives, time frame, and risk tolerance, the better your wealth advisor will be able to develop a development strategy and interaction that are specifically tailored to meet your needs.
- **Portfolio Construction** – The development of the portfolio, which is broken down into two crucial components: resource designation and speculation decision, comes next in the cycle. Together, you and your wealth advisor will develop a system for managing your resources. Before your money growth strategy is put into action, you will have the opportunity to audit and endorse any speculation proposals.
- **Asset assignment** determines how your speculative funds are allocated among the several venture classes, which are commonly referred to as values, fixed pay protections, money or currency market instruments, and genuine resources (like land, products and different resources). Options for resource allocation are also described in terms of interests in domestic safeguards vs international or global resources.
- **Investment determination** is the progression where the stocks that make up the value part, the bonds that make up the proper pay part and the genuine resources that make up the genuine resource part are chosen for your portfolio.
- **Implementation** – Once resource distribution and venture determination choices are made, they should be executed through the buy and offer of resources or protections, bringing about your speculation portfolio.
- **Portfolio Monitoring and Performance Evaluation** – Checking the status of the venture cycle's execution and evaluating the portfolio come last. Over the long term, it's critical to monitor both your own financial situation and the management of your portfolio. Any advancements in your objectives, risk tolerance, income, total assets, or liquidity requirements—or changes that take place in your life, such as a marriage or separation, the birth of a child, or the loss of a spouse—will necessitate a similar refreshment of your money growth strategy.
- When assessing portfolio execution, it's basic to quantify execution inside the setting of your venture methodology. For instance, it's not useful to anticipate returns comparable to the market if a part of your portfolio is secured through a capital protection procedure that tries to give hazard changed returns.

The Critical Role of Communication in the Investment Process

Communication is just as important as measurement for the ongoing execution and execution of a speculation approach tailored to your wants and aims. The questions "Am I Still on Target?" and "What Will Current Market Patterns Mean for My General Technique?" cannot be answered by speculative results, plans, annual reports, and unremarkable call environments. These questions can, however, be answered by your devoted Wealth Advisor, and that is just the beginning.

You may anticipate that your wealth advisor will meet with you on a regular basis, depending on your needs and preferences, and will collaborate with the investment committee to manage and continuously evaluate your portfolio to help ensure you stay on track towards your goals. You can rely on your wealth advisor to actively recommend adjustments to your financial strategy if economic conditions or conditions in your day-to-day living change because they invest some time in getting to know you and acting as your own supporter and guide. Exchange warnings will be sent to you if there is movement in your portfolio.

During the time spent speculation, there are principle 5 venture measure steps that assist financial backers with bettering clarify speculation measure. Steps of venture measure assist financial backers with acquiring understanding into their monetary circumstances. That gives a superior comprehension of the monetary objectives to the financial backers.

The various steps in the speculation measurement process aid the customer in learning more about the venture cycle as well as the actual operation of the speculation interaction. Financial backers should give the requirement of the means in speculation measure their utmost consideration before really contributing, as the venture cycle steps lead in an issue-free manner to a better arrangement, and in actually contributing with the aid of speculation measure steps.

Here are the following steps involved in investment process that help explain the process of investment:

1. Assess Your Current Financial Situation
2. Define Your Investment Objectives
3. Allocate Your Assets
4. Select an Investment Process Strategy
5. Monitor and Manage Investment Process

Step 1. Assess your Current Financial Situation

The first stage is to design in order to clarify the hypothetical interaction. The first step in planning is determining your current financial situation. You must keep your project goals at the forefront of your mind while keeping an eye on the supporting factors, including your assets, liabilities,

and, most importantly, your appetite for risk. You (and your representative) will be better able to choose the appropriate techniques and investment strategies if you make the effort to thoroughly review all of the venture decision interaction processes.

Understanding is a crucial component of contributing, making this one of the key phases of venture measurement. If financial backers are fully aware of their financial situation and are able to afford high-risk areas, different stages of the speculation cycle may be beneficial to them.

Here is a helpful speculative measure guide for each stage of your life to help you plan the amount you should set aside for the years to come.

Stage 2. Characterize your Investment Objectives

After studying the three elements mentioned above, you now need to create a detailed risk bring profile back. You must choose the level of risk you're ready to accept and the variations in gain you can tolerate because the market is unstable. Remember the reliable rule: the greater the return, the greater the risk.

This does not, however, mean that you should stake everything and put all of your eggs in one basket. Making a system that can provide you with a good amount of profits at an acceptable level of risk is the path to a successful venture.

One of the key steps in venture measurement is defining your investment targets. The venture measurement tools help the financial backers go in the right direction. Examining your financial situation was perhaps one of the most important steps in the speculative procedure. Knowing where you stand financially helps you become aware of what your financial goals should be.

With the help of the processes in the venture choosing cycle, you should then set the benchmarks to monitor how your speculation is performing. Along with showing you a picture of the exhibition, it will also enable you to easily make changes as needed.

Stage 3. Distribute your Assets

As a first-time buyer or a long-term investor, you should keep in mind that real estate is a time-consuming investment that can be difficult to liquidate. This means that switching to trading in the present is really tough, and if you try to sell quickly, it usually means taking a hit on the price. However, the property offers a steady return because you will receive the month-to-month lease each month. Before investing in real estate, speak with a home financing specialist.

As a young specialist, you may be better equipped to handle difficulties and distribute more resources. But given that people are getting closer to retirement, it's normal. that they'll cash out a specific sum since their danger resilience is lower.

Stage 4. Select an Investment Process Strategy

Whenever you've assigned your resources, you'll need to settle on how you'll develop your cash. Basically, you have two kinds of portfolio techniques to browse.

- **Passive-Passive portfolio** the executives is a technique wherein the financial backer's motivation is to reflect a market's file. It's a receptive technique that permits the financial backer to procure restores equivalent to the portion of the market.
- **Active-Active portfolio** the board involves more danger since the financial backer's motivation is to beat the market. Since this procedure requires consistent tweaking, one's finished concentration and consideration are required.

In case you're considering which type is better, the appropriate response relies upon the resource classes you've chosen and the impact of the monetary areas included. To more deeply study their key contrasts, investigate this aide.

Stage 5. Screen and Manage Investment Process

This is the remaining method used to interact with venture choice. Since your processes have been carried out, this is an excellent time to examine and address your suppositions. You must observe your portfolio's presentation at regular intervals to see how well it is doing. The benchmarks you've set, whether they're quarterly or annual, will let you know if you're still on track to meet your goals.

Since changes in your day to day existence and the economy will happen after some time, it's important to change your methodologies, too. On the off chance that your venture interaction isn't in accordance with your danger reward profile, you can re-balance it by selling speculations that have arrived at their objectives and purchasing speculations that have an exceptional yield potential.

Venture measure steps are the venturing stones of insightful speculation. Speculation measure steps help financial backers so as to not wind up being misinformed by others and are effective in making hazardous ventures carefully.

Investment Alternatives

India currently has access to a variety of venture highways. Following consideration of the advantages and drawbacks of several roads, a financial backer would be in a position to select the optimal route on his own. Indeed, financial backers can get guidance in choosing the right investment roads from financial announcements, paper supplements on financial topics, and speculation diaries.

Investment roads are the power source of assets. A confusing scope of venture choices are accessible, they fall into two general classes, viz,

monetary resources and genuine resources. Monetary resources are paper (or electronic) guarantee on certain issues like the public authority or a corporate body. The significant monetary resources are value shares, corporate debentures, government protections, and store with banks, mail centre plans, common asset shares, protection strategies, and subordinate instruments. Genuine resources are addressed by substantial resources like private house, business property, horticultural ranch, gold, valuable stones, and workmanship object. As the economy propels, the general significance of monetary resources will in general increment. Obviously, overall the two types of ventures are corresponding and not cutthroat.

Financial backers are free to select any one of at least one elective roads according to their needs. Security, liquidity, and a reasonable return on their contributed assets are priorities for all types of financial backers. Along with new developments in the financial industry, India's choices for speculation are constantly growing.

Currently, speculation is possible on corporate safeguards, public advantageous assets, common assets, and so on. As a result, investors currently have access to a wide range of venture roadways. However, the financial backers should exercise extreme caution while spending their well-deserved funds. A financial backer can choose the best road subsequent to considering the benefits and negative marks of the accompanying venture choices:

- Shares
- Debentures and Bonds
- Public Deposits
- Bank Deposits
- Post Office Savings
- Public Provident Fund (PPF)
- Money Market Instruments
- Mutual Fund Schemes
- Life Insurance Schemes
- Real Estates
- Gold-Silver
- Derivative Instruments
- Commodity Market (commodities)

Financial supporters need to be familiar with the features and benefits of various speculative options in order to make wise investments. These are the several endeavour paths where lone financial backers can stash their hard-earned money.

An essential component of abundant amplification is investment. As we have previously seen and explored, the fundamental rule of investment is

that speculation can take place anywhere there is a requirement for reserves or another type of interest. Before pursuing enterprise choices, one should consider the risk/reward balance. Nowadays, business has become much more challenging.

Customarily, individuals accepted that putting resources into higher-hazard venture like stocks and bonds would prompt higher prizes over the long run. Be that as it may, today one needs to confirm every one of the terms and condition applied in market. Financial backer likewise needs to check if the choices are fitting. Elective speculation assists with acquiring benefit regardless of whether market is unpredictable. Speculation elective has led to the new idea called the broadening of asset. The following inquiry which comes in the brain of financial backer is the place where and how to broaden the assets. Indeed, even monetary ads, paper supplement, magazines on monetary issue and venture diary offer direction to the financial backer to choose appropriate speculation options. Venture roads are the power source of assets. Decisions of appropriate speculation options should be possible by getting return and hazard profile. Wide scope of speculation choices are accessible now-a-days. They are available in two general classes, viz. monetary resources and genuine resources.

Verifiably, options were only available to institutional and high total asset financial supporters due to restrictions on admission, insufficient liquidity, and a lack of transparency, among other segmentation barriers. Though options have been more widely recognised, they have also become more widely available, more fluid, and more simple. Financial backers can gradually obtain access to options through shared assets and trade in traded assets based on their wants and requirements for the speculative options that are selected. All types of financial backers are equally interested in the health, safety, and productivity of the assets they have given. With ongoing advancements in the financial industry and growing innovation, speculating alternatives are currently steadily growing.

Anyway the financial backers ought to be cautious about their well-deserved cash. Financial backers should check the speculation choices by utilizing following inquiries:

- Are you as expanded as you ought to be?
- Do you have sufficient venture that is probably going to go up when financial backers' speculation is down?
- Do you truly need to enhance the asset? Why?
- Other than this, is there any most ideal approach to differentiate the assets?

This will serve to at last expand financial backer's certainty to contribute and chance will lessen. Benefits and bad marks of all venture choices will be dissected with the assistance of above question and best choices will be chosen thinking about all the danger factors. The significant outside

wellspring of capital is public investment funds, which can be acquired as offer capital, debenture, credit capital and public store.

11.5 PORTFOLIO PERFORMANCE MEASUREMENT

Single Index Model

For the sake of simplicity, Sharpe believed that a security's return could be viewed as being linearly connected to a single index, such as the market index. The market index should, in theory, include all of the securities that are traded on the market. A popular average, however, can be used as a stand-in for the market index.

The idea of a market between individual securities has gained acceptance since any changes in securities might be linked to changes in the one underlying element that the market index measures. The Market Model or Single Index Model is the name given to the Markowitz Model's simplification (SIM).

In an attempt to capture the relative contribution of each stock towards portfolio risk, William Sharpe has developed a simple but elegant model called as 'Market Model'. His argument is like this.

We recognise that, to a certain extent, the portfolio risk decreases as the number of stocks rises. Systematic risk is that portion of risk that cannot be further lowered even when we add a few more equities to a portfolio. This irreducible risk is related to the influence of systematically operating elements, mostly at a certain market. All traded securities in a market are included in a portfolio, which lowers risk to the extent of market impacts.

In such a scenario, comparing a stock's returns to those of the market index makes it simple to quantify each stock's contribution to portfolio risk. We can predict that a connection like this one will reveal the provided scrip's market sensitivity. With a straightforward regression equation, William Sharpe calculated the exact relationship between returns on individual stocks and returns on Market Indices, such as the SENSEX, ET Index, NSE Index, or RBI Index.

$$R_{it} = \alpha_i + \beta_{mt} R_{mt} + e_{it}$$

Where

R_{it} = Return on i^{th} security during t^{th} holding period

R_{mt} = Return on a Market Index during t^{th} holding period

α = Constant term

β_{mt} = Market Beta or Market Sensitivity of a given stock

Beta Predicting: Beta, as commonly defined, represents how sensitive the return of an equity portfolio (or security) is to the return of the overall market. It can be measured by regressing the historical returns of a

portfolio (or security) against the historical returns of an index; the resulting slope of this regression line would be the historical beta. This can be useful for attributing relative performance to various sources or for explaining active risk over a certain period of time.

Portfolio managers are also very interested in what the beta of a portfolio (or security) will be in the future, or what the realized beta will be. As one might expect, predicting the value of beta can be a complicated process.

Historical betas were not particularly good predictors of realised betas in the past when returns were normally available no more frequently than monthly; reaching statistical significance typically required using returns from previous periods that were no longer relevant. Barra was a pioneer in the 1970s when it came to calculating anticipated betas based on statistically significant historical links between equities returns and other risk indicators, among other things, using multi-factor equity models. With the idea that anticipated betas calculated in this way would be better predictors of realised betas than previous betas were, other suppliers followed this example and created their own multi-factor models.

11.6 SUMMARY

- Portfolio management is a basic part of contributing. Every portfolio the board system has an extraordinary arrangement of benefits and disservices that should be weighed prior to choosing which way to deal with seek after.
- There can be as various kinds of portfolios and portfolio systems as there are financial backers and cash supervisors. You additionally may decide to have numerous portfolios, whose substance could mirror an alternate system or venture situation, organized for an alternate need.
- The objective of Portfolio management is to amplify the profits of the whole portfolio; not simply the profits from a couple of stocks in the portfolio. By observing and dealing with your venture portfolio, you can construct an enormous corpus to meet different monetary objectives including making a retirement reserve. Yet, for that, it is important to begin contributing as right on time as could be expected. This would give you quite a while period to amplify your profits.
- The risk management interaction is a component of the structure, and is gotten from the danger the executive's strategy, which it operationalises. The danger the board cycle is an orderly use of the executive's arrangements, systems and practices to the undertakings of imparting, setting up the setting of, evaluating, checking and auditing hazards.

11.7 UNIT END QUESTIONS

A. Descriptive Questions

1. Discuss The Dow Theory.
2. Explain the process of Process of Optimal Portfolio.
3. What are the two *Types of Portfolio Strategy*?
4. Discuss Single Index Model
5. What are the steps involved in investment process that help explain the process of investment?

B. Fill in the Blanks

1. can best be viewed as an integrated process to which security analysis makes its unique contribution.
2. The is one of the oldest and most famous technical tools.
3. The Dow Theory was developed by
4. The Elliott Wave theory was developed byin the 1930s.

Answers

1-Investment decision-making 2-Dow Theory, 3-W.P. Hamilton, 4-Ralph Nelson Elliott

11.8 REFERENCES

References book

- *Derivatives Market* NCFM Module. National Stock Exchange India Limited Publications:Bombay:2007.
- Gupta S.L (2007). *Financial Derivatives* Prentice Hall. New Delhi.
- *Indian Stock Market Review*.National Stock Exchange Publications.
- Jaynath Rama Varma (2008). *Derivatives and Risk Management*. Tata McGraw Hill Publications:New Delhi.

