Department of Distance and Continuing Education
University of Delhi

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ESSENTIALS OF FINANCIAL INVESTMENT

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LESSON 1
INVESTMENTS-AN OVERVIEW

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STRUCTURE

1.1 LEARNING OBJECTIVES

Following completion of this unit, you will be able to:

- Understand the concept of investment.
- Analyse various investment methods
- Understand the concept of investment management.
- Explain the concept of investment, speculation & Arbitrage.

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1.2 INTRODUCTION

Investment, often known as investing, has a number of closely related meanings in business management, finance, and economics that have to do with saving money or putting off buying things. A deposit is often put into a bank or an asset is usually bought with the expectation of receiving a return or interest in the future. The phrase refers to the act of putting things (money or other claims to resources) into other people's pockets The term's basic definition is an asset retained for some future recurring or capital gains. It is an asset that is anticipated to generate returns with little to no activity on its part. In finance and economics, "investment" has multiple meanings. Financial economists distinguish between a financial asset, such as money placed in a bank or the market, which may subsequently be used to purchase a real asset, and a real investment (such as a machine or a house).

1.3 TYPES OF INVESTMENT

Investment in finance is defined **as the cost of capital (May confuse students),** which includes the cost of purchasing securities, other monetary or paper (financial) assets on the capital or money markets, or fairly liquid real assets like gold, real estate, or collectibles. The process of determining if a possible investment is worth its cost is called valuation. The risk-return spectrum will be followed by investment returns. Shares, other equity investments, and bonds are some examples of financial investments (including bonds denominated in foreign currencies). These financial assets are then anticipated to generate income or positive future cash flows, and their value may rise or fall, resulting in capital gains or losses for the investor.

Transactions in contingent claims or derivative securities are not strictly speaking considered assets, securities, or investments because they do not necessarily have future positive expected cash flows. Nonetheless, because of how closely their cash flows connect to (or are generated from) those of certain securities, they are frequently analyzed or handled like investments.

Investments are **normally** made in an indirect manner through middlemen like banks, mutual funds, pension funds, insurance providers, CIPs, and investment clubs. Every person who contributes money to an investment made by an intermediary normally receives a claim against the intermediary, however the legal and procedural details of each claim may differ.

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In terms of personal finance, money used to buy shares, invest in a collective investment plan, or purchase any item with a component of capital risk is considered an investment. In terms of personal finance, saving is the act of setting money aside, usually on a regular basis. This distinction is crucial because, in contrast to saving(s), where the risk is more limited, investment risk might result in a capital loss when an investment is realized.

This distinction is made more difficult by the frequent use of the phrases saving and investing. For instance, banks frequently promote deposit accounts as investment accounts. An asset can be either a save or an investment, depending on where the money is invested: if it is cash, it is a saving; if it's worth is uncertain, it is an investment.

Investment in real estate refers to the use of funds to buy a piece of land with the intention of holding it permanently **or capital gain in the future** or renting it out to generate income.

The various investment options in India for a resident person include the following:

Stocks: Stock investing is among the most frequent and well-liked financial solutions. But how does buying stocks work? You become a company's shareholder if you purchase stock in it. Shares of ownership are stocks. The success or failure of the company, the general health of the stock market, and other variables affect whether you make money on a stock or lose it.

Bonds: An investor's debt to a borrower is represented by a bond, a fixed-income investment. By purchasing bonds, you are effectively lending money to the company or the government. You receive a fixed interest rate on this loan, and that amount serves as your return on investment. Bonds contain the risk aspect as well. Depending on the sort of bond you buy, this risk may change.

Mutual Funds: Mutual funds are essentially collectives of capital gathered from a number of individuals and invested in a range of goods to achieve certain objectives. These funds are managed by a fund manager.

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Unit Linked Insurance Plan (ULIP): Unlike a regular insurance policy, a ULIP is a product offered by insurance companies that combines the advantages of a life insurance policy and an investment into a single package. Also, you get to reduce your income taxes.

Public Provident Fund: PPF is a simple investment option that generates excellent returns after retirement. It's an interest-paying savings scheme supported by the government that places your money in a fixed-term account.

National Savings Certificate (NSC): You can open a National Savings Certificate (NSC) at any post office location, which is a fixed income investment program. The program is a project of the Indian government. It is a savings bond that entices investors, primarily those with low to moderate incomes, to invest while reducing their taxable income.

This program is a low-risk fixed-income product, just like Public Provident Fund and Post Office FDs. You can purchase it from the closest post office under your name, for a juvenile, or on a joint account with another adult. The fixed maturity time for NSC is five years. NSC purchases are not restricted in any way, however only investments up to Rs. 1.5 lakh qualify for a tax credit under Section 80C of the Income Tax Act. The fixed interest rate on the certificates is currently set at 7% per year. The government periodically changes the interest rate.

Recurring Deposits (RDs): Recurring deposits (RDs), usually referred to as term deposits, give consumers the freedom to invest a sum of their choice each month and save money without difficulty. In India, the majority of banks and NBFCs provide recurring deposit accounts with terms ranging from six months to ten years.

1.4 PROCESS OF INVESTMENT MANAGEMENT

Investment management is the professional management of a variety of assets (such as real estate) and securities (such as shares, bonds, etc.) to achieve certain investment objectives for the benefit of investors. Institutional investors include insurance firms, pension funds, corporations, and others. Private investors include those who make investments directly

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through investment contracts as well as more frequently through collective investment plans like mutual funds.

While the more general word "fund management" can be used to describe all types of institutional investment as well as investment management for individual investors, it is frequently used to refer to the administration of collective investments. In the context of so-called "private banking," investment managers that specialize in advising or discretionary management on behalf of (often rich 0r High Networt investors) private investors may frequently refer to their services as wealth management or portfolio management.

Financial analysis, asset and stock selection, plan implementation, and continuing investment monitoring are all components of investment management services. A sizable and significant global industry, investment management is looking after trillions of dollars, euros, pounds, and yen. Several of the largest businesses in the world, which fall under the umbrella of financial services, manage investments in some capacity, employ millions of people, and generate billions in income. A company that offers investment management services as well as a person or people who oversee "fund management" decisions are both referred to as fund managers (or investment advisors).

1.4.1 Process

The three P's—Philosophy, Process, and People—are frequently used to refer to the considerations that managers take into account while making investment management decisions.

- The overarching principles of the investing company are referred to as its "philosophy." For instance, (i) Does the management invest in growth or value stocks, and if so, why? (ii) Based on what evidence does he think market timing is true? (iii) Does he hire a research staff or does he rely on outside research? It is advantageous if all of these essential assumptions are backed up by proof-statements.

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- The way in which the overarching concept is applied is referred to as the "process." For instance: (i)Which asset class(es) are investigated before specific assets are selected as viable investments? (ii) How does the manager choose what and when to purchase? (iii) How does the manager choose what and when to sell? (iv) Who makes decisions and do they follow a committee process? (v) What safeguards are in place to make sure a rogue fund—one that is extremely dissimilar from other funds and from what is intended—cannot develop?
- The workforce, notably the fund managers, is referred to as "people." Who are they, one wonders? How do they get chosen? What is their age? Who is the reporting line? How well-rounded the team is (and do all the members comprehend the concept and procedure they should be employing)? The most crucial question is how long the team has been working together. This final query is crucial because the performance history provided to the client at the beginning of the relationship may or may not correspond to (have been created by) a team that is still in place. The performance record may not be at all relevant to the current team (of any size) if the team has undergone significant change such as high staff turnover or other changes

Investment Managers and Portfolio Structures: The managers who invest and sell client money are the backbone of the investment management sector. Each client's unique demands and risk profile should be evaluated by a registered firm investment advisor. The counselor then suggests suitable investment options.

Asset Allocation: Investment management businesses are compensated for the various asset classes and the activity of allocating funds among these assets (and among specific securities within each asset class). The distribution of funds among asset classes will have a big impact on the performance of the fund since different asset classes have different market dynamics and interaction effects. According to several studies, the choice of individual assets has less predictive potential in predicting portfolio return than asset class allocation. The ability of a

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competent investment manager may lie in creating the asset allocation and individual holdings separately in order to outperform specific benchmarks (e.g., the peer group of competing funds, bond and stock indices).

Long Term Returns: It is crucial to examine the data pertaining to holding period returns (the returns that accumulate on average across various investment horizons) and long-term returns to various assets. For instance, in most nations over very long holding periods (like 10+ years), bonds have produced higher returns than cash, and bonds have produced higher returns than equities.

Diversification: Fund managers build a list of intended holdings in accordance with the level of diversity that makes sense for a specific client (given its risk preferences) in light of the asset allocation. The list will specify how much of the fund ought to be allocated to each specific stock or bond. Markowitz developed the idea of portfolio diversification. To be effective, diversification must take into account cross-correlations between returns, internal portfolio concerns (such as individual holding volatility), and correlations between asset and liability returns.

Investment Styles: The choice of an investment style is influenced by expected returns and risk tolerance. The institution can use a variety of various fund management strategies. Growth, value, market neutrality, contra, small capitalization, indexed, etc. are a few examples. Each of these strategies has unique traits, supporters, and, in any given financial situation, unique risk characteristics. In contrast, there is evidence that value styles tend to outperform the indices particularly successfully when such growth is abundant. As an example, there is evidence that growth styles (buying rapidly growing earnings) are particularly successful when the companies able to generate such growth are scarce.

Performance Measurement: The key indicator of successful fund management is fund performance, and in the institutional setting precise assessment is essential. Institutions monitor the performance of each fund under their management for this reason, as well as the performance of its components (which are typically measured for internal objectives) by external organizations that specialize in performance measurement.

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1.4.2 Common mistakes in investment management

Knowing some frequent errors people make while approaching financial planning could be helpful:

1) Set non-quantifiable financial objectives.
2) Make a financial choice without considering how it will affect other financial matters.
3) Investing and financial planning are the same.
4) Neglect to routinely review their financial plan.
5) Believe that only wealthy people engage in financial preparation.
6) Believe that money preparation is something for later in life.
7) Consider that retirement planning and financial planning are the same.
8) Don't start your financial planning until there is a financial catastrophe.
9) Be prepared for inflated investment returns.
10) Believe that working with a financial planner means letting go of control.
11) Consider tax planning to be the main component of financial planning.

1.5 OBJECTIVES OF INVESTMENT

Investments have four main goals: to keep your money safe, to help it grow (capital growth), to create a second source of income, and to be able to reduce your income taxes. Protecting your retirement period and advancing your future ambitions are two other investment aims.

Safety: You may prevent outliving your savings by putting your money in investment plans. If protecting your hard-earned money is your first priority, you must invest in a fixed deposit or PPF that offers a guaranteed fixed return. An EPF provides the same purpose for people who are employed.

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Capital Growth: It is essentially not an investment if your money isn't increasing. Because of this, the phrases "savings" and "investments" are distinct. We put money aside, and then we invest it for capital growth. Savings are all they are if they aren't growing.Your investing portfolio needs to include high-risk assets like mutual funds, the stock market, real estate, and equity if you want to increase the value of your money. High return probabilities are associated with high risk potential; the trick is to find the proper mix.

Income: A reliable source of income is another common goal of investing. These investments include equities that routinely pay dividends as well as fixed deposits that pay interest on a regular basis, such as time deposits at the post office. Investments that provide income may be able to assist you in covering your everyday needs when you retire.

Tax Deduction: Getting a tax break is the second most common advantage of investing after the three goals mentioned above. The finest examples of investments that reduce taxes include pension plans (80CCC), NPS, and life insurance policies (80C for deductions on premiums paid and 10 (10D) for sum insured received).

1.6 FINANCIAL V/S REAL INVESTMENT

Investments are made in shares, bonds, debentures, and other securities. Financial assets are claims against an underlying business; therefore, the value of the underlying asset.

Issuer - On the liabilities and equity side of the balance sheet are financial assets.

Owner - On the assets side of the balance sheet are the financial assets.

Real investment is investments in real estate, construction, gold, and silver. Real and financial assets are related in that financial assets are claims on the revenue generated by actual assets. Stocks and bonds are "financial" assets, whereas land and equipment are "real" assets.

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Extent of liability: Financial investments do not apply to all transactions. While financial investments involve the issuance of a piece of paper in exchange for money evidencing the liability of the issuer (recipient of money) to provide return to the investor, some transactions involve the exchange of real property (house, land, etc.) for a financial consideration with no obligation on the part of the supplier of the property to provide return to the investor on the property. Both are referred to as investments—the former as actual investments and the latter as financial investments.

Uncertainty: In financial investment transactions, the party obligated to produce returns may or may not always fulfill its obligation. Even then, it might not arrive on time. Investment in the financial sector is therefore uncertain. As real investments entail the exchange of actual property, there is little chance of doubt after the transfer of property has occurred.

Liquidity: Liquidity is another factor that sets real investments apart from financial ones. The ability of an asset to be rapidly, easily, and with minimal exchange cost converted into money is referred to as liquidity. The absence of established markets and trading systems is a major factor in real assets' lower liquidity compared to financial assets. Stock exchanges will offer liquidity for financial investments.

Real assets have a disadvantage over financial assets in that they are less liquid due to lower volume and less frequent trade. As a result, the price reflected on real assets typically has a significantly wider spread than the price reflected on financial assets, indicating lower market efficiency. On the other hand, financial assets change hands every day, allowing the price to be updated in "real-time." Real and financial assets are valued similarly in many ways, including in part by their capacity to generate cash flows, but real assets are recorded at their historical cost and, where appropriate, are deducted for depreciation. On the other hand, it is frequently possible to see the market value of financial assets.

1.7 INVESTMENT VS SPECULATION

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"Previous success does not assure future success." This may have been stated by investing firms. In fact, they are required to say this by the Securities Exchange Board of India (SEBI). Wouldn't it mean investing is the same as speculating if we can't predict the future? Although it could seem that way, investing and speculating are not the same thing.

Let's dissect the contrast between investors and speculators in order to comprehend it. It's crucial to understand the distinction in order to avoid investing all of your money in speculative assets when doing so.

1.7.1 What is investing?

The act of investing involves trading money for assets whose worth you can reasonably anticipate rising over time, resulting in a capital gain. They pay more attention to the underlying company' performance than just the investment's price. Instead of large returns in only a few weeks or months, investors frequently focus on incremental long-term gains. Investors purchase shares in publicly traded firms that are listed on markets like the Bombay Stock Exchange of India (BSE) or Nasdaq in the United States. These companies are mandated to release quarterly earnings reports, which give investors the chance to assess the company's financial situation and make wise investment choices.

Although investing does not come without risk, it is generally a more cautious strategy based on a company's demonstrable success. It involves more than just the asset's future price in a few months. Investing is the buying of an asset with the intention of making money. In a broader sense, it alludes to giving up current funds or other resources in exchange for future rewards. Time and risk are the two primary components of investment.

Today's market offers a variety of investment possibilities, including the ability to deposit money into a bank account, buy property, stock in a firm, invest in government bonds, and contribute to funds like EPF or PPF.

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The two main categories of investments are fixed income investments and variable income investments. Bonds, preference shares, provident funds, and fixed deposits are examples of fixed income investments that have a predetermined rate of return.

Examples

While speculators may enter these markets and cause bubble markets, many investment kinds are excellent for long-term appreciation and don't necessitate short-term speculating.

High Quality Stocks: You can purchase stock to get ownership in a publicly listed corporation. This typically refers to blue chip stocks from reputable corporations in the context of investments. Investments like mutual funds and stock ETFs can also be considered.

Bonds: A bond is a type of loan that enables businesses to pay for their activities. The bonds offer a low interest rate in return. Government and corporate bonds, as well as bond ETFs and mutual funds, are often preferred by investors.

Real Estate*:* One of the earliest types of investments is real estate, which is still popular today. Real estate is not without risk, but it typically makes for a good investment.

Certificates of Deposit (CDs)*:* Bonds and CDs have certain similarities; however CDs are often issued by banks and credit unions. As risk-free an investment as you can get, CDs offer a low interest rate.

Annuities*:* One way to think of annuities is as a type of retirement insurance. You can make a one-time, fixed payment and then get a lump sum or ongoing payments in the future.

1.7.2 What is Speculating?

Speculating is the act of purchasing assets in the anticipation of making substantial profits, frequently very quickly. Speculators may quickly enter and exit assets multiple times.

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Speculators accept the great risk of entire value loss associated with speculative assets in exchange for the potential for big profits. Speculative investments sometimes include penny stocks and unproven companies.

The competitive position, future success, or productivity of the underlying company are typically less important to speculators than the price of an item. Instead of analysing a company's qualities, they can place greater emphasis on price changes and technical charts.

Speculators frequently monitor the values of their favored asset on a daily or even hourly basis. For speculators, this thorough scrutiny can be distressing because these assets have the potential to be quite volatile.

A trading activity known as speculation includes making a hazardous financial transaction in the hopes of reaping huge profits from changes in the market value of financial assets. The risk is compensated by the likelihood of making a sizable profit. Even yet, the risk that speculators assume is carefully considered and calculated.

In markets where there are significant price movements for securities, such as the market for stocks, bonds, derivatives, currencies, commodities futures, etc., speculation can be observed.

Examples

These investments are speculative even if they are frequently popular. In general, if you invest money in them, you should expect to lose it all.

Crypto currencies: Crypto currency offers benefits including quick transactions and simple currency conversion. While a few bit coin investors have gained millions, a lot more have suffered significant financial losses.

Commodities: Unbranded products like oil, gold, silver, and agricultural products like corn and soybeans are examples of commodities.

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***Options**:* Options are agreements that let you buy or sell a stock by a particular date at a certain price. In order to make predictions about price changes for various asset classes, traders can purchase options contracts.

***Artwork**:* Some people consider art to be a good investment because of its potential for rapid price growth. Yet, the popularity of artists and artistic movements can change with time, making purchasers less interested in purchasing once-valuable works of art.

Collectibles: Nearly anything that individuals enjoy collecting can be considered a collectible, including trading cards, toys, and comic books. Interest in them can ebb and go very quickly, just like with artwork.

The type of investments that famed investor Warren Buffett avoids is speculative ones. Investors employ a methodical strategy to increase their wealth, purchasing assets that carry a small amount of risk in exchange for potential long-term gains. On the other side, speculators purchase assets that might rise quickly but could also lose all of their value if they become unpopular. Depending on how you look at them, common assets like stocks and bonds can be investments or speculative assets. Understanding the difference can help you balance your degree of risk with your anticipated return.

From this discussion, it can be concluded that the two terms are distinct from one another and shouldn't be used interchangeably. Investors are very important in sustaining market liquidity, but speculators are also very important in absorbing excessive risk and supplying necessary liquidity when investors are not participating.

1.8 RISK RETURN TRADE-OFF

There is a trade-off between risk and return, which is the most fundamental concept of financial literature. According to the risk-return relationship, a security's return must be

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proportionate to how risky it is. All investment assets should offer a rate of return that is consistent with the risks involved if the capital markets are operationally effective. As the relationship between risk and return is inverse, an investment with higher risk should provide a larger return. The "ability-to-sleep-at-night test" might easily be used to describe the risk/return trade-off. Others are scared to ascend the financial ladder without a secure harness, while some people can withstand the equivalent of financial skydiving without batting an eye. Choosing the level of danger, you can accept while yet feeling at ease with your investments is very important.

The dictionary definition of risk in the context of investing is the likelihood that the actual return on an investment will be lower or higher than anticipated. Technically, the standard deviation in statistics is used to measure this. Risk is the chance that you could lose part or even all of your initial investment. Low potential returns are correlated with low levels of uncertainty (low risk). High potential returns are correlated with high levels of uncertainty (high risk). The balance between the goal for the lowest risk and the largest return is known as the risk/return trade-off. The chart below graphically illustrates this. A higher standard deviation indicates greater risk and potential reward. The correlation between risk and return is seen in the graph below.

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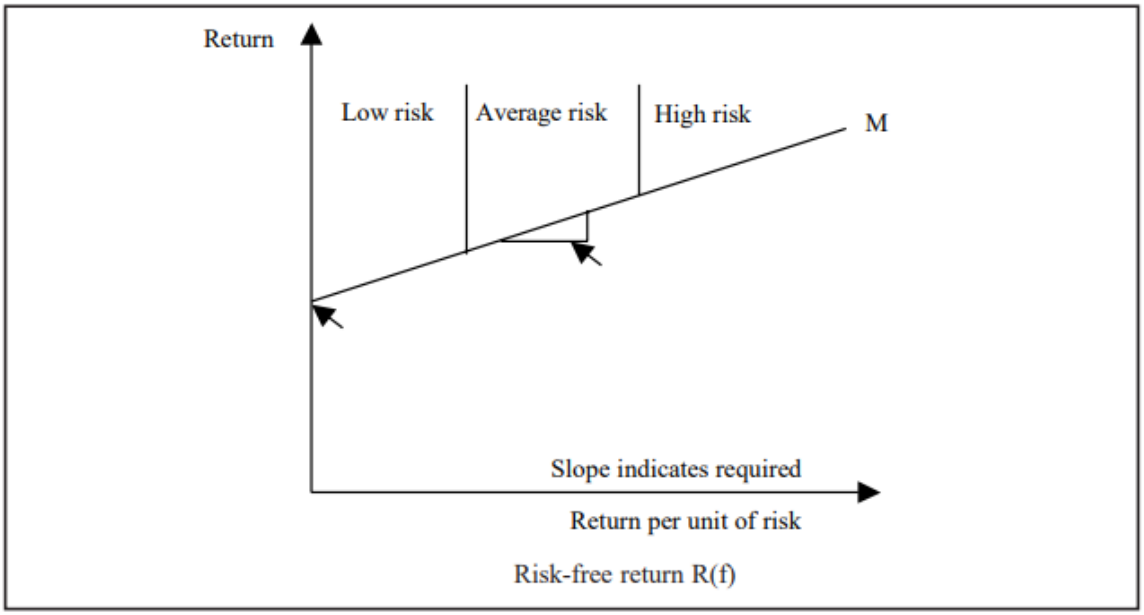

Figure 1.1: Risk and Return Relationship

The Market Line's slope reveals the return per unit of risk that all investors demand. Investors who are extremely risk averse would have a steeper line, and vice versa. Yields on ostensibly comparable equities can vary. Variations in price, and consequently yield, reflect how the market views the standing of the issuing company and the risk factors in the specific equities. A high yield in comparison to the market as a whole indicates a higher risk component.

The illustration below illustrates this.

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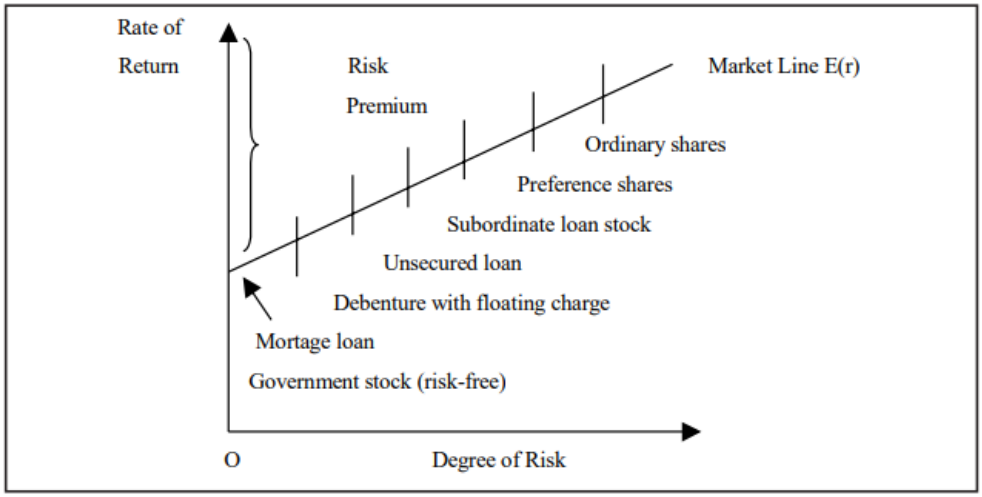

Figure 1.2: Risk Return Relationship of Different Stocks

Investors would choose investments that are consistent with their risk preferences, given the current composite market line. While some favour high-risk investments, others will explore low-risk ones.

It's a frequent misperception that increased risk translates into higher returns. According to the risk/return tradeoff, taking on more risk opens up the possibility of greater profits. But, there are no assurances. Risk carries a bigger possible loss as well as a higher potential profit.

The return on Treasury Bills of government assets, whose risk of default is virtually zero, represents the risk-free rate of return at the low end of the distribution. If the risk-free rate is currently between 8 and 10%, that suggests that we can make between 8 and 10% annually on our investment with almost no risk.

Who wants to make 6% when index funds often return 12% annually over the long term is a common query. The index fund, which serves as a proxy for the entire market, explains that risk exists even there. Index fund returns vary from -5% one year to 25% the next, and so on, rather than being constant at 12% annually. The risk and volatility an investor must still accept in order to achieve an overall return that is higher than that of a dependable

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government security. This additional return is what we refer to as the risk premium, and it is 8% in this instance (12% - 8%).

Finding the risk level that is best for you is a difficult decision to make. Each has a different level of risk tolerance. Your choice will be influenced by, among other things, your ambitions, finances, and general situation.

1.9 SUMMARY

- Investment in economics refers to the production of products per unit of time that will be used for current production rather than consumption.
- Investments are frequently made in an indirect manner through middlemen like banks, mutual funds, pension funds, insurance providers, CIPs, and investment clubs.
- Investment in real estate refers to the use of funds to buy a piece of land with the intention of holding it permanently or renting it out to generate income.
- The factors that managers take into account while making investment management decisions are commonly referred to as the "three P's": philosophy, process, and people.
- The four basic objectives of investments are to protect your money, increase it (capital growth), generate a second source of income, and possibly lower your income taxes.
- Speculating is the act of acquiring assets in the hope of swiftly and significantly increasing earnings.
- The act of investing involves trading money for assets whose worth you can reasonably anticipate rising over time, resulting in a capital gain.
- The most fundamental idea in financial writing is the trade-off between risk and return. The risk-return relationship states that a security's return must be commensurate to its level of risk.
- All investment assets should offer a rate of return that is consistent with the risks involved if the capital markets are operationally effective.

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1.10 GLOSSARY

- ***Investment*** - Investing, often known as investing, has a number of closely related meanings in business management, finance, and economics that have to do with saving money or postponing purchases.
- ***Financial Management*** - An analysis of choices, especially financial ones, such as purchasing stocks or other monetary or paper (financial) assets on the capital markets or money markets, or fairly liquid real assets like gold, real estate, collectibles, etc., is known as a decision research.
- ***Asset Management*** - The management of collective investments is frequently referred to as asset management.
- ***Fund Performance*** - The key indicator of successful fund management is fund performance, and in the institutional setting precise assessment is essential.
- ***Investment Management Process*** - In order to achieve certain investment goals for the benefit of the investors, it is the professional management of a variety of securities (shares, bonds, etc.) and assets (e.g., real estate).

1.11 SELF-ASSESSMENT QUESTIONS

1. What do you mean when you say "investment"?
2. What types of investments are there?
3. Describe the investment procedure.
4. What procedures should be followed while giving advice regarding the management of investments?
5. What safety measures and cautions ought a financial manager to exercise when making investment-related decisions?

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LESSON 2
RISK AND RETURN

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STRUCTURE

2.1 LEARNING OBJECTIVES

After this lesson, the learners will be able to:

- Understand the concept of risk and return while evaluating a financial investment.
- Compute and analyse different types of return.
- Estimate and evaluate different types of risks.
- Compute and analyse portfolio return and risk.
- Recognise the impact of taxes and inflation on investment decisions.

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2.2 INTRODUCTION

To value any investment decision, the primary aspect considered by an investor is the return provided by the asset. While making investment choices, investors would be naturally inclined towards assets providing higher returns. Although a prima facie attractive decision, a very important aspect which is being ignored here is the risk of this investment. Risk is defined as the deviation of actual outcome from expected outcome. All investment decisions are prone to risk. However, the level of risk may vary, and some investments may be safer than others. Economic theory suggests that investments with a higher risk have a greater possibility of providing higher returns. However, an investor would prefer to put her/his funds in investments that maximise return and minimise risk. The relationship between risk and return is commonly referred to as Risk-Return trade off. To make a sound investment decision, an investor must simultaneously evaluate its return and risk. This lesson deals with the discussion on understanding and estimating the return and risk of investments.

2.3 RETURN

Return is defined as the profit generated by an investment. Investors may look at the following different types of returns while valuing their investment decisions.

2.3.1 Absolute vs. Relative Return

An investor can evaluate return in absolute terms as the total income generated from the investment. Absolute return for a financial asset can be computed using the following formula:

$$I + CG \quad (1)$$

Where,

I is the total dividend or interest income from the asset

CG is the capital gain provided by the asset, which is the difference between its selling price and purchase price.

One can also look at return in percentage terms when seen relative to the cost of investment. In this case, the following formula would be used to compute return:

$$\{(I+CG)/C_0\}*100 \quad (2)$$

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Where,

I is the total dividend or interest income from the asset

CG is the capital gain provided by the asset

C_o is the cost of acquiring (or purchase price) of the asset

2.3.2 Average Return

When investors are looking at a longer-term horizon, they may assess the average return earned by an asset. Average return can be computed using Arithmetic Mean with the following formula:

$$AM = \sum_{i=1}^{n} r_i/n \quad (3)$$

Where,

AM: Arithmetic Mean

r_i : return earned in year i

n : number of years for which the investment is held

Illustration 2.1 Ms. X wants to calculate average return of a share of ABC Ltd., currently available at ₹ 150 as on 31st Jan. 2023. The share price at the end of Jan.' 20, 21, and 22 was ₹ 100, 120, and 125 respectively. Also, the stock paid dividends of ₹ 0, 6, and 10 during the year 2020, 21, and 22 respectively. Compute the average return based on A.M.

Solution 2.1

Year	Stock Price (In ₹)	Dividend (In ₹)	Capital Gain (In ₹)	Return (In %)
2020	100	0	-	-
2021	120	6	20	((20+6)/100)

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				*100 = 26%
2022	125	10	5	((5+10)/120) *100 = 12.5%

Average Return = (26%+12.5%)/2 = 19.25%

The above method of computing average return may appear simplistic. However, it has certain flaws. The computation of arithmetic mean does not consider the impact of compounding. This may give misleading results.

For e.g. Consider a situation in which an investor buys a share for ₹200. At the end of year 1, its price is ₹ 250. The investor holds it for another year, and at the end of year 2, the price drops to ₹ 200 again. In this case, the average return using the above formula would be 2.5%. However, this is logically incorrect as the investor has not earned anything over the past 2 years. Hence, to consider the impact of compounding, it would be better to use Geometric mean to calculate average return.

Geometric mean can be computed using the following formula:

$$GM = \{(1+r_1)(1+r_2)\ldots\ldots(1+r_n)\}^{1/n} - 1 \quad (4)$$

Where,
GM: Geometric Mean
$r_{1,2\ldots,n}$: return earned in year 1,2….,n
n : number of years for which the investment is held

In the previous example, the GM = $\{(1+0.25)(1-0.2)\}^{1/2} - 1 = 0$.

2.3.3 Holding Period Return

Holding period return is defined as the total return earned during the entire investment horizon (i.e. the holding period). It is computed using the following formula:

$$HPR = \{TI + (P_n - P_0)\}/ P_0 \quad (5)$$

Where;

HPR: Holding Period Return

TI : Total Income received during the period

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P_n: Sale price at the end of the holding period

P_0: Purchase price

n: No. of years for which the asset is held (holding period)

Illustration 2.2

An investor purchases a non-dividend paying share at the cost of ₹ 2000 in the beginning of year 2022. At the end of year 2022, it is sold at ₹ 2500. Calculate its HPR.

Solution 2.2

HPR = {(2500-2000)/2000}* 100 = 50%

The estimation of Holding Period Return is very useful for investors. However, it suffers from certain limitations. It does not consider the annual return. Also, if the holding period of two investments is different, their return cannot be compared using holding period return. To overcome this, an investor can compute the Effective Annualised Return of the investment.

2.3.4 Effective Annualised Return

It is defined as the equivalent annual return earned by a long-term investment. It can be computed using the following formula:

$$EAR = (1+r_t)^{1/t} - 1 \quad (6)$$

Where;

EAR: Effective Annualised Return

r_t: Holding Period Return

t: Holding period in years

The concept of EAR is useful to compare returns across investments with different time horizons.

Illustration 2.3

An investor wants to invest in a zero-coupon bond having face value of ₹1000. Three different maturity period bonds are available as mentioned below. Which is the best investment option?

Bond	Time Horizon	Price (In ₹)
A	6 months	910

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B	1 year	920
C	15 years	250

Solution 2.3

In this case, it would be inappropriate to compare the investments using Holding Period Return, as all three bonds have a different time horizon. It would be appropriate to compute the Effective Annualised Return for comparing securities. The HPR and EAR of all three bonds, computed using the above formulae are shown below:

Bond	HPR	EAR
A	[(1000-910)/910]*100 = 9.89%	[(1+0.0989)^2 – 1] *100= 20.76%
B	[(1000-920)/920]*100 = 8.70%	[(1+0.0870)^1 – 1]*100= 8.7%
C	[(1000-250)/250]*100 = 300%	[(1+3)^1/15 – 1]*100= 9.68%

In this case, Bond C is the best as per HPR, but A is the best as per EAR. We must evaluate the securities as per EAR, as the holding period of all bonds is different.

2.3.5 Expected Return

The different types of returns discussed so far are the returns which are realised by investors. However, while making an ex-ante investing decision, investors would be interested in computing expected returns from securities. This calculation is based on probability distribution of returns. It can be computed using the following formula:

$$E(r)=\sum_{i=1}^{n} p_i r_i \qquad (7)$$

Where,
E(r)= Expected return on the security
P_i = Probability in 'i^{th}' situation (where, i=1 to n)

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R_i= Return in 'i^{th}' situation

Illustration 2.4

You are given the return on a stock which depends on the state of economy. Compute its expected return from the following data:

State of the Economy	Return	Probability
Good	17%	30%
Normal	15%	40%
Bad	-5%	30%

Solution 2.4

E(r) = (17%*30%) + (15%*40%) – (5%*30%) = 9.6%

2.3.6 Portfolio Return

After discussing the concept of return on individual securities, the next aspect that needs to be covered is the concept of portfolio return. We define portfolio as a collection of different securities. An investor who has put her/his funds into different assets, would be interested in computing the overall return on the portfolio. This can be computed using the following formula:

$$E(r_p) = \sum_{i=1}^{n} w_i r_i \quad (8)$$

Where,

$E(r_p)$= Expected return on the portfolio

W_i: Weight of security 'i' in the portfolio (A portfolio has 'n' number of securities, where the weight of each security is the percentage of total funds invested in each security)

r_i: Return of security 'i'

Illustration 2.5

An investor has ₹ 2,00,000 for investment in debt and equity. He expects to earn return of 15% on his overall investment. Debt and equity are expected to provide return of 10% and 20% respectively. What amount should he invest in both the alternatives?

Solution 2.5

Assume he invests w % of funds in debt, and (1-w)% in equity

(W)(0.1) + (1-w)(0.2) = 0.15

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W=50%= ₹ 1,00,000; 1-W = 50%= ₹ 1,00,000

2.4 RISK

Risk is defined as the deviation of actual outcome from expected outcome. Financial securities are risky if the actual return provided by them is different from their expected return. We compute risk as the variability in expected returns, using the following formula:

$$\sigma = \sqrt{\sum_{i=1}^{n} p_i[r_i - E(r)]^{\wedge 2}} \quad (9)$$

Where,
σ : Standard Deviation of the security
p_i : Probability in the 'i^{th}' situation (where, i=1 to n)
r_i: Return in the 'i^{th}' situation
E(r): Expected return of the security

We compute the variance in return ($\sigma^{\wedge 2}$), and take its square root to compute the standard deviation.

Illustration 2.6

Compute the risk and return on the security (X) with the following probability distribution of returns:

Probability	**Return (%)**
10%	10%
30%	15%
20%	-5%
20%	20%
20%	15%

Solution 2.6

E(r) = 11.5%

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p_j	r_j	$(r_j-E(r))^{\wedge 2}$	$p_j*((r_j-E(r))^{\wedge 2}$
0.1	0.1	0.00023	0.00002
0.3	0.15	0.00123	0.00018
0.2	-0.05	0.0272	-0.00136
0.2	0.2	0.0072	0.00144
0.2	0.15	0.0012	0.00018
$\sigma^{\wedge 2} = \sum p_j[r_j-E(r)]^{\wedge 2}$			0.00046

Standard Deviation (σ) = $\sqrt{0.00046}$ = 0.0214 = 2.14%

2.4.1 Absolute vs. Risk Adjusted Return

Absolute return is defined as the total return provided by an investment without considering its risk.

Whereas, risk adjusted return is defined as the return expressed in terms of per unit of the underlying risk. It is computed using the following formula:

Risk-adjusted return = (Expected Return – Risk-free return)/Total Risk (10)

2.4.2 Coefficient of Variation: A Relative Measure of Risk

When investors have to compare different investment alternatives, they should look at the return as well as risk provided by all the securities. For this, they can compute the return per unit of risk or risk per unit of return for different securities.

A very popular measure for this purpose is the Coefficient of Variation. This computes the risk per unit of return using the following formula:

CV = [σ/ E(r)]*100 (11)

Where,
CV: Coefficient of Variation
σ : Standard Deviation of the security
E(r): Expected return of the security

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Investors should prefer securities with lower CV, as it minimises the risk per unit of return.

Illustration 2.7

An investor is interested in investing her funds in securities of A Ltd. or B Ltd. Stocks of these companies have the following expected return and risk:

	A Ltd.	B Ltd.
Expected Return	15%	12%
Risk (σ)	10%	5%

Which stock should the investor prefer?

Solution 2.7

To evaluate this situation, an investor must compute the Coefficient of Variation (CV).

CV_A = (10%/15%) *100 = 66.67%

CV_B = (5%/12%) *100 = 41.67%

The investor should purchase the stock with lower CV. Hence, stock of B Ltd. should be preferred, in spite of it giving lower return, as it has a lower risk per unit of return.

2.4.3 Portfolio Risk

After understanding the estimation of risk for individual securities, it is essential to understand the concept of portfolio risk.

While computing the risk of a portfolio of securities, we cannot simply take the weighted average of the risk of individual securities, like in the case of portfolio return. This is because the overall risk of portfolio can reduce if the investor holds a well-diversified portfolio.

Diversification is defined as an investment strategy in which an investor mixes a variety of investments. If these assets are not strongly correlated with each other, or they move in different directions in response to an event, the overall risk of the portfolio comes down. This is the benefit that an investor can derive from a well-diversified portfolio.

To understand the calculation of portfolio risk, one must first understand the computation of covariance and correlation. These are two important statistical measures that indicate the relationship between two variables. If both variables move in the same direction, they are said to have a positive covariance or correlation, and vice versa.

Covariance is computed using the following formula:

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$$\sigma_{xy} = \sum p_i[r_{xi}-E(r_x)][r_{yi}- E(r_y)] \quad (12)$$

Where,
σ_{xy} = Covariance between returns of x and y
Other variables have the same meaning as mentioned above

While, covariance indicates the direction of relationship between two variables, investors can compute the correlation to analyse the strength of this relationship. Correlation is a scaled form of covariance and is computed using the following formula:

$$\rho_{xy} = \sigma_{xy}/(\sigma_x * \sigma_y) \quad (13)$$

Where,
ρ_{xy} = Correlation coeffecient between returns of x and y
Other variables have the same meaning as mentioned above

The coefficient of correlation can take a value between -1 and +1, where -1 indicates strongly negative correlation, +1 indicates strongly positive correlation and 0 indicates no correlation.

After understanding the computation of covariance and correlation, we can compute the portfolio risk using the following formula:

$$\sigma_p^2 = \sum_{x=1}^{N} w_x^2 * \sigma_x^2 + \sum_{x=1}^{n} \sum_{\substack{y=1 \\ x \neq y}}^{n} w_x * w_y * \sigma_{xy} \quad (14)$$

$$\sigma_p = \sqrt{\sigma_p^2}$$

Where,
σ_p^2 = Portfolio Variance
σ_p = Portfolio Standard Deviation
σ_x^2 = Variance of security 'x' (Portfolio has N number of securities)
w_x , w_y= Weight on security x and y respectively
σ_{xy} = Covariance between x and y

As mentioned earlier, the portfolio risk cannot be the weighted average of risk of individual securities as every pair of securities co-vary with each other. Thus, it is important to consider the covariance/correlation amongst each pair of securities in the portfolio.
The above formula is generalised for any number of securities in the portfolio. It can be simply written for 2 securities portfolio in the following manner:

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$\sigma_p = \sqrt{[(w_1^2 * \sigma_1^2) + (w_2^2 * \sigma_2^2) + (2 * w_1 * w_2 * \sigma_{12})]}$
or

$\sigma_p = \sqrt{[(w_1^2 * \sigma_1^2) + (w_2^2 * \sigma_2^2) + (2 * w_1 * w_2 * \sigma_1 \sigma_2 \rho_{12})}$
Where,
All variables have the same meaning as mentioned above.

Similarly, it can be written for 3 securities portfolio as;

$$\sigma_p = \sqrt{[(w_1^2 * \sigma_1^2) + (w_2^2 * \sigma_2^2) + (w_3^2 * \sigma_3^2) + (2 * w_1 * w_2 * \sigma_{12}) + (2 * w_1 * w_3 * \sigma_{13}) + (2 * w_2 * w_3 * \sigma_{23})]} \quad (16)$$

Where,
All variables have the same meaning as mentioned above.

For further analysis, depending on the sources or causes of risk, we can decompose total risk into systematic and unsystematic risk. This is discussed in the following sub-sections.

Illustration 2.8
Following are the set of returns for stocks X and Y:

Probability	20%	20%	20%	20%	20%
Return on Stock X	10%	8%	24%	9%	-5%
Return on Stock Y	-3%	12%	10%	10%	6%

You are required to answer the following:

1. Estimate the return and risk of stocks X and Y.
2. Which stock should be preferred?
3. Find the covariance and correlation between X and Y.
4. Assuming that an investor holds a portfolio of stocks X and Y, with 60% of his funds invested in stock X, find the portfolio return and risk.

Solution 2.8

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p_i	r_{xi}-$E(r_x)$	r_{yi}- $E(r_y)$	$p_i[r_{xi}-E(r_x)]^{\wedge 2}$	$p_i[r_{yi}- E(r_y)]^{\wedge 2}$	$p_i[r_{xi}-E(r_x)][r_{yi}- E(r_y)]$
0.2	0.008	-0.100	0.0000	0.0020	-0.0002
0.2	-0.012	0.050	0.0000	0.0005	-0.0001
0.2	0.148	0.030	0.0044	0.0002	0.0009
0.2	-0.002	0.030	0.0000	0.0002	0.0000
0.2	-0.142	-0.010	0.0040	0.0000	0.0003
Summation			0.0085	0.0029	0.0009

(1) Expected return on stock X ($E(r_x)$) = 9.2%

Expected return on stock Y ($E(r_y)$) = 7%

Risk of Stock X (σr_x) = $\sqrt{0.0085}$ = 0.0919 = 9.19%

Risk of Stock Y (σr_y) = $\sqrt{0.0029}$ = 0.0536 = 5.36%

(2) CV (X) = (9.19/9.2)*100 = 99.89%

CV (Y) = (5.36/7)*100 = 76.57%

Stock Y should be preferred because it has lower Coefficient of Variation.

(3) **Covariance (σ_{xy})** = $\sum p_i[r_{xi}-E(r_x)][r_{yi}- E(r_y)]$ = 0.0009

Correlation (ρ_{xy}) = $\sigma_{xy}/(\sigma_x * \sigma_y)$ = 0.1783

(4) **Portfolio Return ($E(r_p)$)** = $\sum_{x=1}^{n} w_x r_x$ = (60%*9.2%) + (40%*7%) = 8.32%

Portfolio Risk (σ_p) = $\sqrt{[(w_1^2 * \sigma_1^2) + (w_2^2 * \sigma_2^2) + (2 * w_1 * w_2 * \sigma_{12})]}$

= 6.27%

Further, risk Can be categorised into two types:

Systematic Risk

Unsystematic Risk

2.4.4 Systematic Risk

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It is that portion of risk which affects all securities in the market. Hence, it is also referred to as non-diversifiable risk. It is caused by factors which are beyond the control of a specific firm. The following are the main causes of systematic risk:

- ***Market Risk:*** It refers to the tendency of security prices to move together. It is primarily caused due to the herd mentality of investors, in which investors may move in tandem with the movement of majority of investors. Thus, security prices may move away from their expected value in response to the movement of other securities in the market. There may be other common factors also such as political uncertainties, war, etc. that may drive prices of all security in the same direction.
- ***Interest rate Risk*****:** It refers to the change in security prices due to the change in market interest rates. Rise in interest rates has a negative impact on all securities, and vice versa. With rising interest rates, the prices of bonds would come down. Moreover, the cost of borrowing for companies would increase, leading to lesser profits and stock prices. Thus, changing interest rates would affect almost all securities in the market.
- **Purchasing power (Inflation) Risk:** This refers to the change in security prices due to changes in inflation rate. Inflation erodes the real value of cash flows from an asset. Purchasing power of investors' income reduces in times of rising prices, which leads to lower returns in real terms. Any change in the inflation rate can lead to a change in the real value of returns earned by investors.
- **Exchange Rate risk:** This is the risk related to rising or falling value of foreign currency vis-à-vis domestic currency. It affects companies with global exposure. We classify exchange rate risk as systematic risk, since large number of firms have direct or indirect foreign exchange exposure.

To measure systematic risk, we need to understand the concept of Beta (β) of a security. β is defined as the sensitivity of security's return to market return. While assessing market return, we consider any prominent well diversified market index. β is computed using the following equation:

$$R_i = \alpha_i + \beta_i R_m + e_i \quad (17)$$

Where,

R_i: Return on a particular security i

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R_m: Return on market index

α, β: Intercept and Slope of the regression equation respectively

Using the formula for slope calculation, we can compute β as:

$$\beta_i = \sigma_{i,m} / \sigma^2_m \quad (18)$$

Where,

$\sigma_{i,m}$: Covariance of security return with market return

σ^2_m : Variance of market return

After computing β , we can estimate the systematic risk using the following formula:

$$\beta^2_i * \sigma^2_M \quad (19)$$

Where,

β_i measures the sensitivity of return of security 'i' to market return

σ^2_M is the variance of market return

2.4.5 Unsystematic Risk

It is that portion of risk which can be diversified by holding a portfolio of securities with less or negative correlation. It is caused by factors which are specific to an industry/firm. Following are the main causes of unsystematic risk:

- **Business Risk:** This refers to the risk that can affect an organisation's operations. It may arise due to internal factors such as changing management policies, labour relations, etc. At the same time, it may occur due to external factors such as competitive pressures or change in technology, affecting the demand of organisation's products/services, and supply side problems.
- **Financial Risk:** This is associated with the firm's financing decisions and is related to the amount of debt in its capital structure. A firm which has high amounts of fixed financial obligations, may land into distress in the absence of adequate profitability. The variability in cash flows which arises due to change in level of debt is referred to as financial risk.

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Unsystematic risk is also known as Idiosyncratic risk and is computed as the difference between total risk and systematic risk. The following formula describes the calculation of unsystematic risk:

$$\sigma^2 e_i = (\sigma^2_i) - (\beta^2 * \sigma^2_m) \quad (20)$$

Where,

$\sigma^2 e_i$= Unsystematic risk of security 'i'

σ^2_i = Total Risk (Variance) of security 'i'

$\beta_i^2 * \sigma^2_m$ = Systematic risk of security 'i'

By adding larger number assets in a portfolio, an investor can reduce the unsystematic risk of the portfolio. However, the systematic risk cannot be reduced, as it affects almost all the securities in the market. This is illustrated in the figure below:

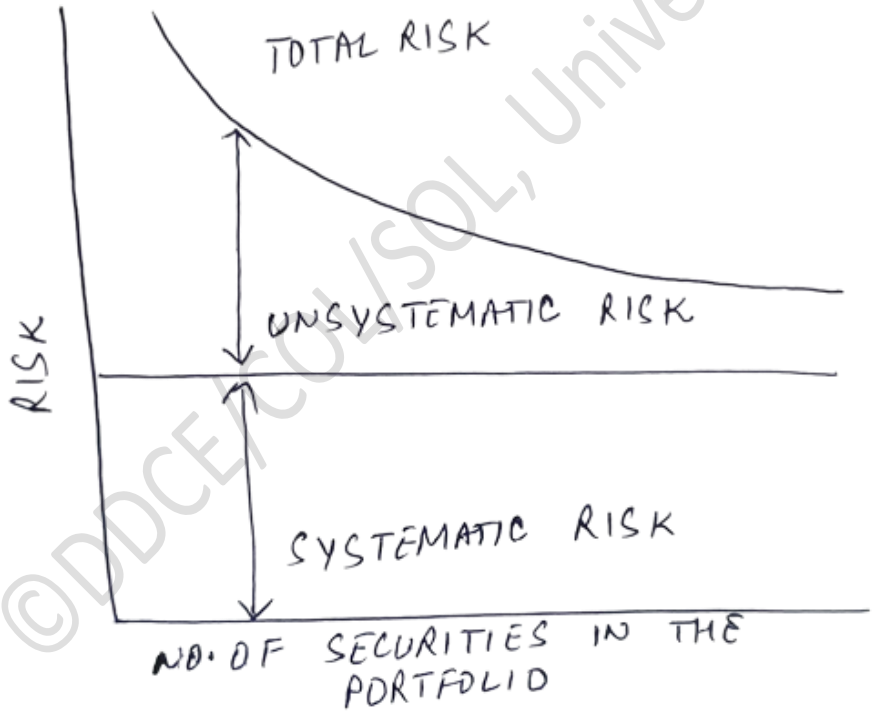

Fig 2.1: No. of Securities and Risk

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Illustration 2.9

An investor has the following information for a security X and the market portfolio M. Find out the total risk, systematic risk and unsystematic risk of the security.

Probabilities	Return of Security G	Return of Market Portfolio
33.33%	11%	12%
33.33%	15%	10%
33.33%	12%	15%

Solution 2.9

Using the above-mentioned formulae, we can make the following estimations:

Total Risk/Variance (σ^2_i): 0.003

$\beta_i = \sigma_{i,m} / \sigma^2_m$: -0.5263

Systematic Risk ($\beta_i^2 * \sigma^2_m$): 0.00012

Unsystematic Risk (Total Variance – Systematic Risk): 0.0002

2.5 TAXES AND INVESTMENTS

A very important aspect that needs to be considered while evaluating the net returns from investments, is the impact of taxes on security returns. The tax on capital gain/loss for listed equity shares is governed by the Income Tax Act, 1961.

The tax varies according to the period of holding assets. For equity shares listed on recognised stock exchanges, short term refers to a period of less than equal to 1 year, and long term refers to a period of more than 1 year. The tax incidence on long term gains is lower than that for short term gains.

For short term capital gains (STCG), the tax liability is as follows:

15% + Surcharge (as applicable) + Cess (as applicable)

For long term capital gains (LTCG), the tax liability is as follows:

In case LTCG <= ₹1,00,000: NA

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In case LTCG > ₹1,00,000: Excess of Rs. 1,00,000 is taxable at 10%+ Surcharge (as applicable) + Cess (as applicable)

Taxes on LTCG were reintroduced in the year 2018, but investors are allowed the benefit of 'Grandfathering'.

A Grandfathering clause is a provision in which an old rule continues to apply to some existing situations while a new rule applies to all subsequent cases. Investors who are exempt from the new rule are said to have acquired rights (or grandfather rights).

The following rules are applicable in case of grandfathering of long-term capital gains:

LTCG is not applicable to gains made up to 31st January 2018.

For the purpose of computing capital gains, the cost of acquisition is treated as higher of;

- The actual COA of such investments
- The lower of:
  - Fair Market Value ('FMV') of such investments
  - Sale price of the investment

Further, the FMV is taken to be the highest price quoted on the recognized stock exchange on 31st January 2018.

Illustration 2.10

An investor purchased equity shares on 14th December 2016 at the price of ₹11,000. The fair Market Value of the shares was ₹12,000 as on 31st January 2018. She sold the shares on 11th May 2018 at a price of ₹16,000. What will be the long-term capital gain/ loss?

Solution 2.10

In this case, the Cost of Acquisition (COA) would be computed as follows:

Higher of:

- Original COA i.e., ₹11,000, and
- Lower of:
  - FMV on 31st January 2018, i.e., ₹12,000, and
  - Sale Price, i.e., ₹ 16,000

Hence, COA = Higher of (₹ 11,000 or ₹12,000) = ₹ 12,000

Here, Capital Gain/ Loss would be computed as follows:

Sale Price – COA

₹16,000 – ₹12,000 = ₹4,000.

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2.6 INFLATION AND INVESTMENTS

The purchasing power of money reduces due to inflation. Thus, it is important for an investor to consider the rate of inflation prevailing in the market while evaluating an investment decision. Investors must consider the real rate of return (i.e., inflation-adjusted rate of return) rather than the nominal rate of return, which is the prima facie return on investment.

The real rate of return can be computed from the nominal rate of return using the following formula:

$$r = [(1+n)/(1+i)] - 1 \quad (21)$$

Where,

r = real rate of return

n = nominal rate of return

i = inflation rate

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IN-TEXT QUESTIONS

1. Risk related to the level of debt in a firm's capital structure is known as:
   a) Business Risk
   b) Market Risk
   c) Financial Risk
   d) None of the above
2. To compute the average return on an investment, an investor must use:
   a) Geometric Mean
   b) Simple Average
   c) Weighted Average
   d) None of the above

3. The risk which can be reduced due to diversification is known as:
   a) Systematic Risk
   b) Idiosyncratic Risk
   c) Market Risk
   d) None of the above

4. While comparing different securities, an investor should calculate:
   a) Covariance
   b) Correlation
   c) Coefficient of Variation
   d) Beta

2.7 SOLVED ILLUSTRATIONS

Illustration 2.7.1

The following data is available for a particular security:

Probability	Return
10%	20%
10%	15%
20%	12%

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20%	5%
40%	18%

You are required to compute the expected return and risk of the stock.

Solution 2.7.1

To compute expected return and risk, we use the following formulae:

$$E(r)= \sum_{i=1}^{n} p_i r_i$$

Where,
E(r)= Expected return on the security
p_i = Probability in 'i^{th}' situation (where, i=1 to n)
r_i = Return in 'i^{th}' situation

$$\sigma = \sqrt{\sum_{i=1}^{n} p_i[r_i - E(r)]2}$$

Where,

σ : Standard Deviation of the security

Other variables have the same meaning as mentioned above.

P_i	R_i	$P_i * R_i$	$P_i(R_i - E(R))^{\wedge 2}$
0.1	0.2	0.02	0.0003
0.1	0.15	0.015	0.0000
0.2	0.12	0.024	0.0001
0.2	0.05	0.01	0.0017
0.4	0.18	0.072	0.0006
Total		0.141	0.0027

As per the above calculations,

Expected Return = 14.1%

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Risk:

Variance (σ^2) = 0.0027

Standard Deviation(σ)=$\sqrt{}$ 0.0027 = 0.052 = 5.2%

Illustration 2.7.2

An investor has to choose amongst two investment options. The following table indicates the risk and return of those two options. Which stock should the investor prefer, and why?

	Stock A	Stock B
Return	10%	20%
Risk (Standard Deviation)	5%	11%

Solution 2.7.2

In this case, the investor needs to compute the return per unit of risk or risk per unit of return to make an appropriate investment choice. We compute the CV as it is a popular measure used for this purpose.

CV: [σ/ E(r)]*100
Where,
σ : Standard Deviation of the security
E(r): Expected return of the security

Here,

CV_A = (5%/10%)*100 = 50%

CV_B = (11%/20%)*100 = 55%

The investor must prefer stock A in spite of lower return, as it has a lower risk per unit of return**.**

Illustration 2.7.3

An investor has ₹ 50,000 for investment. She has invested 40% of her funds in stock X, which is expected to provide a return of 15%; and the remaining money in stock Y, which is likely to provide a return of 20%. Compute the expected return on her total investment.

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Solution 2.7.3

Here, portfolio return would be computed using the following formula:

$$E(r_p) = \sum_{x=1}^{n} w_x r_x$$

Where,

$E(r_p)$= Expected return on the portfolio

w_x : Weight of security 'x' in the portfolio (A portfolio has 'n' number of securities, where the weight of each security is the percentage of total funds invested in each security)

r_x : Return of security 'x'

Thus,

$E(r_p)$= (40%*15%) + (60%*20%) = 18% = 18% * ₹ 50,000 = ₹ 9,000.

Illustration 2.7.4

An investor plans to invest in the following stocks:

	Stock X	Stock Y
Expected Return	10%	12%
Risk (Standard Deviation)	5%	7%
Correlation between two stocks (ρ_{xy})	0.2	

Estimate the expected return and risk of a portfolio which comprises 70% investment in stock X and the remaining in stock Y.

Solution 2.7.4

Portfolio's expected return and risk can be computed using the following formula:

$E(r_p) = (w_x * r_x) + (w_y * r_y)$

$\sigma_p = \sqrt{[(w_x^2 * \sigma_x^2) + (w_y^2 * \sigma_y^2) + (2 * w_x * w_y * \sigma_{xy})]}$

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$\rho_{xy} = \sigma_{xy}/(\sigma_x * \sigma_y)$

Where,

$E(r_p)$= Expected return on the portfolio

w_x, w_y : Weight of security 'x', 'y'

r_x, r_y : Return of security 'x', 'y'

σ_p : Portfolio standard deviation

σ_x, σ_y: Standard deviation of security 'x', 'y'

σ_{xy}: Covariance between x and y

ρ_{xy}: Correlation between x and y

In this case,

$E(r_p)$= (70%*10%) + (30%*12%) = 10.6%

$\sigma_p = \sqrt{[(70\%^{\wedge 2} * 5\%^{\wedge 2}) + (30\%^{\wedge 2} * 7\%^{\wedge 2}) + (2*70\%*30\%*5\%*7\%*0.2)]} = 4.43\%$

2.8 SUMMARY

While evaluating any investment decision, an investor must understand the risk-return trade off and evaluate the risk and return of investments simultaneously. Returns can be of different types. To assess the return earned over the entire period of holding the investment, one would look at the holding period return. To evaluate the return on an annualised basis, effective annualised return should be used. Further, the investors can compute average return from an investment. The appropriate technique for this would be the use of geometric average. While performing an ex-ante analysis, the investors must look at the expected return.

To assess the risk of an investment, investors need to distinguish between systematic and unsystematic risk.

Further, while evaluating the performance of a portfolio of securities, investors should analyse the portfolio's risk and return. For this, one must understand the covariance and correlation between different pairs of assets.

Lastly, investors must evaluate the impact of taxes and inflation on returns to analyse the real returns.

2.9 GLOSSARY

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- Beta: A measure to compute the sensitivity of security's return to market return. It is used to estimate the systematic risk of a security.
- Coefficient of Variation: A measure used to compute the risk per unit of return.
- Diversification: An investment strategy in which an investor mixes a variety of investments to reduce risk of the portfolio.
- Effective Annualised Return: The equivalent annual return earned by a long-term investment.
- Expected Return: Return which an investor expects to earn from an investment. This is based on probability distribution of returns.
- Holding Period Return: The total return earned during the entire investment horizon.
- Risk: Deviation of actual outcome from expected outcome.
- Risk-adjusted Return: Return expressed in terms of per unit of the underlying risk.
- Systematic Risk: The portion of risk which affects all securities in the market.
- Unsystematic Risk: The portion of risk which can be diversified by holding a portfolio of securities.

2.10 ANSWERS TO IN-TEXT QUESTIONS

1. (c) Financial Risk	3. (b) Idiosyncratic Risk
2. (a) Geometric Mean	4. (c) Coefficient of Variation

2.11 SELF-ASSESSMENT QUESTIONS

1. Explain the concept of Holding period return. How is it different from Effective Annualised Return?
2. What are the various causes of systematic and unsystematic risk?
3. Explain the concept of Grandfathering. How does it affect the calculation of taxes on long term capital gains on stocks?

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4. While comparing different investment options, what all parameters should an investor assess? In this light, discuss the importance of coefficient of variation.

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LESSON 3
APPROACHES TO SECURITY ANALYSIS

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STRUCTURE

3.1 LEARNING OBJECTIVES

Following completion of this unit, you will be able to:

- Understand fundamental analysis method
- Analyse technical analysis tools
- Understand charting techniques
- Explain the concept of weak form and random walk, semi-strong form
- Understand efficient market theory and appraisal

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3.2 INTRODUCTION

Choosing appropriate investments destination is a part of our daily economic lives. Everyone makes decisions of this nature in a variety of situations and times. Others mostly lose money, while a few are able to gain greater earnings from their investment decisions. In order to increase the likelihood of gains from investments, efforts should be taken to comprehend and grasp how effective investment decisions can be made. Therefore, investment decision-making is a crucial issue worth investigating thoroughly.

Long term investment decision making had been considered a personal subjective art which may vary from individual to individual. Hence, it was challenging to offer a general structure within which one could function. It is now recognised as a branch of science, leading to the development of a body of literature that aids in our comprehension of how investment decisions might be made. Investors are constantly seeking to understand how these traits affect their judgements as they are constantly changing. They are taken into consideration by the investing decision-maker when deciding which securities he should purchase, hold, or sell.

As investment decision-making is perpetual, it needs to be addressed carefully. The literature recommends broad strategies like technical analysis and fundamental analysis. While using a fundamental strategy, the investor can make an attempt to look at the fundamental components that affect a security's risk-return characteristics. In contrast, in the second strategy, the investor looks for price movement. The supply and demand for stocks in addition to the overall trend in share prices as determined by various market indices on the stock market are the main topics of technical analysis.

3.3 SECURITY ANALYSIS

We all make investment decisions occasionally in various circumstances and at various points in our economic lives. More research and analysis into these judgements are therefore necessary given their highly subjective nature and the diverse outcomes they produce. Investment decision-making has long been viewed as an art, but only recently has it been recognised as a science, leading to the development of a body of literature that explains its dynamics. Making investment decisions is today recognised as both an art and a science. The characteristics of return securities, which are constantly evolving, are something that decision-makers try to stay up with. They need persistent efforts to understand.

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The study of commodities and other tradable financial instruments is known as security. Determine the proper value of particular securities is its main goal (i.e., stocks and bonds). They are frequently categorised as equity, debt instruments, or a mix of the two. The two types of derivatives known as futures and contracts, as well as commodities, are not regarded as securities. Security analysis has many different goals. The primary goals are, however:

- Growth of the capital invested
- Regular flow of income
- Safety of capital invested
- Hedging against inflation

3.4 FUNDAMENTAL ANALYSIS

The fundamental analysis puts forth an effort to study the fundamental or basic aspects that influence the risk-return of the securities. Here, we're attempting to figure out which securities are, in our mispriced on the stock market. In this scenario, it is assumed that there is a difference between the security's "market price" and its price as justified by its "intrinsic worth," and that the market offers a chance for astute investors to identify this disparity. A choice to invest or not to invest is made as soon as such a description is discovered. The decision rule for this strategy is as follows:

Sell a security if the market price exceeds the value that the fundamentals of the stock sustain. This is because it is anticipated that the market will sooner or later realise its mistake and price the security appropriately. Prior to the market making up for its error by raising the price of the underlying asset, selling this investment should be based primarily on its fundamentals. Market price (MP) is the price currently in effect, and intrinsic value (IV) is the price that is justified by the market's fundamentals.

(a) Purchase the security if inherent value is greater than market price.

(b) Sell the security if Intrinsic Value is less than Market Price.

(c) If Intrinsic Value equals to Market Price, no action is taken.

The economy, an industry, a company, or any combination of these may be related to the fundamental variables outlined above. Consequently, when valuing the shares for making investment decisions, company, industry, and economic factors are taken into account. The framework of the economy, industry, and company actually plays a key role in this strategy.

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By making the necessary adaptations in a typical environment, this framework can be used effectively. But a world of caution. Please keep in mind that using an analytical framework does not ensure making the right choice. It does, however, ensure that an investment decision is well-informed and carefully thought out, which is potentially better as it is founded on pertinent and significant information.

Before going into further depth on the ECO-IND-CO framework, it is important to note that there have been questions raised about the applicability of this strategy in the quest for an effective stock market setup. Market efficiency can be defined as the speed, if any, with which the stock market incorporates information about the economy and firm into share prices. None of us would be able to make excessive profits in such a scenario, according to the perspective on the stock market's efficiency that was previously stated. Several academic research studies support the stated point of view. Practitioners, however, disagree with such empirical findings.

3.4.1 Economy, Industry, Company Analysis: A Framework

The essential component of the fundamental approach is the analysis of the economical, industry, and corporation basics as indicated above. When making an investment decision, the analyst should take into consideration all three components that make up distinct but unique processes. These can be viewed as various phases of the investment decision-making process. Pragmatically, all three phases must be considered in order to establish the investment decision on different fundamentals.

3.4.2 Economic Analysis

You must have observed that in reality, individuals and organisations make their investment decisions based on the economic structure of the nation in question. As a result, it is vital to comprehend that country's macroeconomic stellar economy. The performance of the economy in the past, how it is doing now, and how it is anticipated to perform in the future are all taken into account in the macroeconomic study of the condition of the economy. Knowing how various economic sectors will develop in the future is also important in this perspective.

Fig 3.1: Fundamental Analysis

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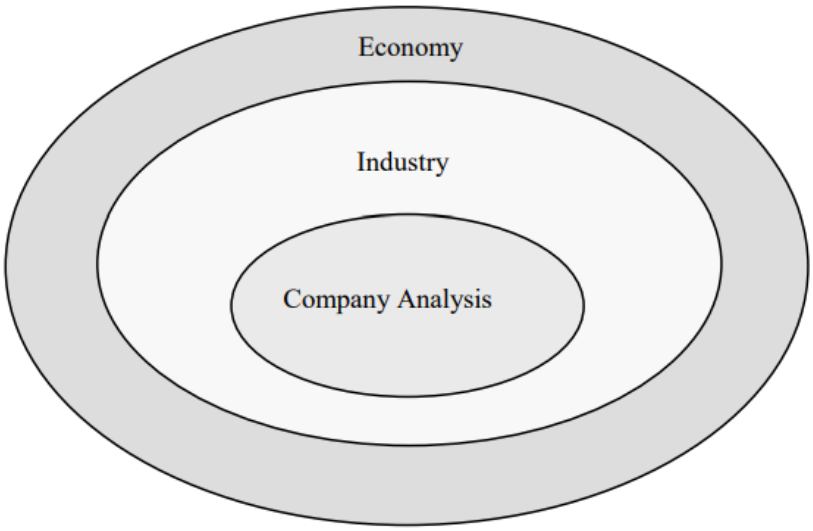

3.4.3 Macro Economic Analysis

The examination of the ensuing variables reveals the macroeconomic shifts that have an impact on risk and return on investment patterns. The global economy must come first in a top-down study of a firm's prospects in a globalised corporate environment. The global economy has an impact on the company's export possibilities, the competition it encounters from foreign rivals, and the success of its foreign investors. Demand-side and supply-side policies are the two main categories of macroeconomic policies used by the government. The two main demand-side economics tools, fiscal and monetary policies, have historically received most of the attention.

3.4.4 Fiscal Policy

The government's spending and taxing activities are governed by fiscal policy. It can be used most effectively to boost or deflate the economy. The demand for products and services is boosted by an increase in government spending while it is deflated by a reduction. The same holds true for tax rates: Lower tax rates lead to higher consumption of goods and services, whereas higher tax rates lead to lower consumption.

3.4.5 Monetary Policy

The main objective of monetary policy is to manage the money supply in the economy. Monetary policy primarily affects the economy using interest rates.

The principal instruments of monetary policy are:

- Bank Rate

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- Repo (Repurchase Option) rate
- Reverse Repo Rate
- Statutory Liquidity Ratio (SLR)
- Marginal Standing Facility (MSF)
- Cash Reverse Ratio (CRR)

3.4.6 Importance of Economic Analysis

Every sector shows evidence of the economy's deterioration and stagnation. This can be examined and understood by researching the historical performance of different economic sectors in the past, their current performances, and creating expectations for their future performances. One will be able to recognize numerous important investment possibilities as they come through this methodical technique. Sectorial analysis is therefore undertaken in relation to overall economy analysis because the rate of expansion in the wider economy commonly differs from the pace within certain segments or sectors.

The justification for the aforementioned type of study is also based on economic considerations. Which industry or collection of industries will grow in the future will ultimately depend on how individuals live their lives in general, what further money they make, and how they spend it. Such expenditures have an impact on company profitability, dividends, and the future growth of share values for many companies. By this point, it should be evident that looking at the economy's past performance is just the first, however important, stage. Yet the predicted future success of the whole economy and its many sectors is most important when the analyst is deciding whether to invest or not. As a result, every effort should be undertaken to predict how the economy will perform so that the choice of whether to invest in or sell stocks can be profitable. It's intriguing that this advises using measures tha t describe how the economy has evolved in the past and how it is anticipated to develop going forward in comparison to the current situation. An upbeat economic forecast greatly enhances the environment for investing in principle and the securities market in particular.

Changes in government policy at the macro level or in the management of a specific corporation may alter the appeal of a particular security. For instance, until 1992–1993, the Indian sugar industry's shares failed to attract the interest of the investing public. But, around 1999, shifts in government policy towards this sector made sugar industry shares highly appealing. The growth in the amount of sugar available for sale on the free market and the price increase of sugar sold both on the open market and through the public distribution system, among other things, were crucial in making stakes of sugar firms more alluring. There may be more elements as well, elements that are more specific to a given industry or firm.

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3.4.7 Industry Analysis

An industry is made up of a recurrent set of enterprises. In other words, a single industrial group can be used to classify enterprises with similar characteristics. Businesses may be grouped based on a range of factors. By way of illustration, traditional classification often divides things into categories based on their type, such as medications, cotton fabrics, synthetic fibres, etc. This classification, while instructive, is not very useful when making financial decisions. From the perspective of investment decisions, some helpful bases for classifying sectors include the following:

- High growth industry
- Seasonal industry
- Defensive industry

The several stages of an industry's evolution are another helpful factor for classification. Various characteristics are displayed at different periods of their life cycles. Each development is, in reality, fairly distinctive. Investors can more accurately identify various investment opportunities in the organisations by grouping businesses with comparable development characteristics. Industries are divided into the following categories based on the stage in their life cycles:

Pioneering stage: This is the initial phase of a new industry's industrial life cycle. In this, technology and its products are still in their infancy and are not yet at their peak. Products and technologies both follow an experimental sequence. Nonetheless, there is a market need for its products, and there are numerous prospects for profit. The risk in this industry starts now, thus the mortality rate is really significant. Investors would earn significant returns if a sector can endure them; otherwise, there is a significant risk of investment. The leasing sector, which attempted to emerge in India throughout the middle of the 1980s, is a particularly relevant illustration of this period of the country's industrial development. During this time, there were hundreds of new businesses created. They initially demanded very expensive lease rentals. But, as business competition increased, leasing rentals decreased until they reached a point where it was challenging for certain organisations to continue. During this time period, many businesses failed to withstand the intense competition from businesses that could withstand the price war's onslaught and stay in business. In comparison to the mid-1980s, the leasing business has significantly decreased in size today.

Fast growing stage: The turbulent competition and growth that characterize the first stage are largely ended by the time we reach the second stage. Businesses that were unable to withstand this attack have already perished. The industry is now dominated by the large enterprises that survived. Their product is still in more demand, which means that businesses

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can make more money. In this stage, businesses expand quickly. Investors have an excellent possibility to invest with these businesses. In reality, as a company develops, it often breaks records in a variety of areas, such as dividend distribution, and becomes more and more desirable as an investment.

Stabilization stage: The another stage is when industries emerge, grow, and stabilise at a rate that is generally equal to that of the economy. When viewed from a different perspective, this is a time when the industry's capacity seems to have more or less reached saturation. The sector is currently struggling with what Grodinsky dubbed "latent obsolescence," a term used to describe a stage where the first indicators of deterioration have arisen, in comparison to the other industries. Investors must exercise extreme caution when inspecting those securities before it is too late.

Decline stage: It is the fourth stage of the industrial life cycle. The business has aged. New goods and innovations have hit the market. Consumers now have new customs, preferences, etc. The products of the business or sector are not as in high demand as they were in the beginning. It nonetheless remains for a little longer. As a result, even in the best economic times, the industry would expand slower than the overall economy.

Many decisions are affected by the features of distinct stages of an industry's life cycle growth. Investing at this point is quite profitable. Yet it is generally advised that a risk-averse investor hoping for reliable returns stay away from the market at this point. Yet, if he is still eager to invest, he should endeavour to diversify or spread the risk of his investment. In this case, it would be wise to look for businesses that are seeing rapid growth. This likely explains why companies in this sector typically have higher stock prices. The decision of which sectors to invest in at the third stage of development is very important from the perspective of investments. The development of the sector, not its past performance, is what matters. Many times, on the strength of a firm's strong performance, the market has artificially inflated the share price of a company in a dying industry. But the truth is that a business in such a sector would sooner or later suffer the effects of its collapse, and an investor who makes a purchase of such a business would eventually see his investment lose value.

After discussing a variety of investment consequences, it may be noted that classification should be done carefully. This is so because the description above makes the assumption that the investor can recognise the industrial life cycle. Which stage the industry is in might be quite difficult to tell in practise. It goes without saying that the aforementioned structure is merely an outline. This analysis can be spangled with the right adjustments. Detailing the characteristics of the industry is necessary to further improve the study. Owing to this distinct attribute, it will be incredibly challenging to make an opinion regarding profitable investment

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prospects until the particular industry is properly and thoroughly researched with relation to these.

3.4.8 Importance of Industry Analysis

What justifies an industry analysis by a security analyst?

Two arguments are offered logically to address this query:

1) Similar degrees of risk and returns are frequently experienced by businesses across all industries. As a result, industry analysis can be helpful in determining a firm's investment-Worthiness.

2) The average stock outperforms the top stock in a growing industry more often than not. This emphasises the need of understanding both corporate and industry prospects.

The following criteria will be taken into account by the securities analyst when evaluating the investment potential of the sector:

- Performance after-sales and earnings
- Government policy regarding business
- Labour circumstances
- Competitive environment
- Industry performance Share prices in relation to industry earnings
- Industry life cycle stage
- Trade cycles in industries

3.4.9 Company Analysis

We talked related to the value of economic and industry analysis as well as its methods. We shall talk about the corporate level analyses in this unit. Let's start by talking about how an investor selects investment decisions given his aim maximisation in order to offer this analysis the correct perspective. Investors use the straightforward maximisation decision rule to maximise profits. Which is:

- Purchase the stock at a discount.
- Sell the stock for a premium.

Although the aforementioned decision rule is fairly easy to understand, it can be challenging to put into practise. It is operationalized with great effort utilising a sound formal and analytical foundation. Investors have a true standard for intrinsic value in this area thanks to fundamental analysis. The fundamentals of the business and the industry will determine this

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value. Out of these three, company level analysis offers an operationally clear connection between an investor's behaviour and his investment objective. This is so because an investor purchases a company's worth rather than the value of an industry or an entire economy. In fact, this framework gives him the necessary context for when he purchases shares of a specific company. So, it is crucial to carefully examine the company's quantitative and qualitative foundations. "If the economic forecast supports purchasing at the time, the industry analysis will guide the investor in identifying the suitable industry in which to invest," as Fischer and Jordan have succinctly said. Yet knowing when to invest and in which sector is insufficient. Knowing which firms and sectors to choose is also crucial.

The ability of an analyst to see both the forest and the trees is the true test of his or her expertise. Intelligence, synthesis, and inference-drawing produce superior judgement. Because of this, company-specific analysis is crucial in addition to economic and industry analysis.

3.4.10 Framework of Company Analysis

The following are the two key elements of a company analysis:

- Financial
- Non-financial

A smart analyst attempts to make an acceptable decision by giving both of these factors the necessary weight. While determining if a company's shares are worthy of investment, the analyst will take into account two key areas of information : (i) internal and (ii) external. The facts and events pertaining to the enterprise as made public by it comprise internal information. The reports and analyses produced by sources outside the corporation, such as the media and research organisations, are referred to as external information.

Non-financial Aspects: For determining a company's worth for making securities investments, an overall holistic viewpoint is crucial. This could be discovered by compiling and studying data on businesses that has been made public in the press, the stock exchange directory, annual reports, and prospectuses.

1. The company's past and current operations

2. Senior management group

3. Contracts for cooperation

4. The product line

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5. Future expansion and diversification plans

6. Research & Development

7. Market condition - rivalry and market share

8. Corporate social accountability

9. Situation involving labour relations

10. Business image,

11 Brand image etc.

In addition to these internal elements, the following external influences affected the survival and reputation of the company:

1. Legal restrictions

2. Governmental strategy

3. Industry life cycle

4. Business cycle

5. Consumption, etc.

Financial Analysis: Financial experts who are interested in investing in equity shares of a company will be worried about the likelihood of a growth in the company's value. A security's asset value is calculated by assessing the firm's liquidating value, subtracting the claims of its creditors, and then dividing the firm's remaining net asset value among its outstanding shares of stock. Only businesses on the verge of bankruptcy should use this strategy. They will see a diminishing and irregular flow of dividends and income from the company. They will therefore be of little value. In contrast, the intrinsic value of going businesses is far more than the value of the company's tangible assets. In the case of successful enterprises, there is unquestionably no relationship between book value and real value. Investment research therefore focuses on the trends of earnings and the associated elements such as dividends, bonus issues, rights shares, and increases in the share's market value. Market Price Per Share (MPS) and Earnings Per Share (EPS) are considered to be the proper metrics for a company's performance (EPS).

Financial statement analysis is the act of evaluating the financial data present in the financial statements critically in order to comprehend and make judgements regarding the firm's operations. It consists primarily of an analysis of the relationships between different financial facts and figures as presented in a set of financial statements, as well as their interpretation in order to gain knowledge of the firm's profitability and operational effectiveness and to evaluate the firm's financial condition and future prospects.

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Financial analysis is a broad word that encompasses both analysis and interpretation. The term "analysis" refers to the methodical classification of financial data that is used to simplify it for the financial statements. Interpretation entails describing the importance and meaning of the facts. These two complement one another well.

3.5 TECHNICAL ANALYSIS

The phrase "technical analysis" is used to refer to a broad range of methods, all of which are based on the idea that historical data on stock prices and trade volume can help an informed investor predict the future. It makes an effort to explain and predict changes in securities prices by focusing solely on market data, as opposed to fundamental analyst's analysis of information about a company or its future.

The price of a stock, according to technical analysts, is mostly determined by market forces such as supply and demand and bears little resemblance to value, if such idea even exists. Pricing is influenced by fundamental economic and psychological factors that are so numerous and complex that no one can possibly comprehend or accurately evaluate them. The technician believes that price and volume figures paint the only meaningful picture from which to base decisions. The technician observes the market, ignoring minute adjustments, moving in clear trends that last for sizable amounts of time. A trend is assumed to persist unless there is solid evidence of a change. The stock's historical performance can then be used to make future projections. As crucial as the proportional size of the change is the price change's direction. The technician makes an effort to accurately identify trends and take advantage of them using a variety of techniques.

The process of evaluating stocks through technical analysis entails examining market indicators, such as previous prices and volume. Instead of attempting to determine a security's fundamental value, technical analysts utilise charts and other tools to look for patterns that may indicate probable future activity.

On the technical trading side, there are as many diverse varieties as there are fundamental investment styles. Most traders utilise a combination of oscillators and technical indicators, while some traders focus on chart patterns. In any case, what distinguishes technical analysts from their fundamental counterparts is their sole utilisation of previous price and volume data.

3.5.1 Technical v/s Fundamental Analysis

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In order to compare technical analysis and fundamental analysis broadly, let's assume that the technician is a trader who buys and sells for short-term gains, while the fundamentalist is a conservative who makes long-term investments. Technical analysis's value actually falls somewhere in between these two extremes.

Fundamentalists focus on the "cause" rather than the "should." They base their choices on the security's quality, value, and dividend or growth potential, based on their own investing goals. They are worried about the foundation, the corporation's financial stability, the track record of revenue and profit growth, profitability, investment acceptance, and so on. They also consider the state of the market and business generally. In order to estimate the stock's future price and establish its current value, they finally interpret these data inductively. Fundamentalists rarely anticipate major earnings in less than a year because they are patient.

Unlike long-term investors, technicians want to make sure their money is always working as profitably as it can. While trading, they aim to make quick gains and are prepared to accept a brief loss if the stock market does not behave as expected.

Technically focused investors begin by looking at the stock's trading activity. If it is positive, they look at the basics to make sure the business is stable and successful. They keep a constant eye on the market, in general, and the performance of all listed stocks, in particular, the price and volume changes of the stock they are thinking about purchasing. They base their choices on technical information rather than fundamental facts.

Table 3.1 Comparison between Fundamental and Technical Analyst

Sr. No.	Fundamental Analyst	Technical Analyst
1.	His viewpoint is a long-term one. He takes a cautious approach.	His outlook is focused on the near future. He's aggressive. He reacts to "what is."
2.	He decides to buy and hold. He typically does not anticipate any notable growth in the value of his investments in less than a year.	He values immediate financial gain. He frequently snuffles his investments because he notices and anticipates fluctuations in stock values.
3.	He believes that the long-term profits from capital appreciation outweigh the short-term dividend return in the case of stock investments.	He does not discriminate between capital gains and current income. He has an interest in quick gains.
4.	He makes stock price predictions using data from the economy, the industry, and the company. Earnings and dividends represent the main deciding factors. He uses a risk-return analysis to	By examining trends in the supply and demand for assets, he makes price predictions for securities. Technical analysis is the examination of information from the stock market.

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	determine the stock's value.	
5.	He employs statistical forecasting methods and financial analysis tools.	Together with a few quantitative tools, he primarily uses charges of financial factors.

3.5.2 Criticism of Technical Analysis

Technical analysis is viewed as a type of black magic by certain critics. They may even mock the discipline's advocates if they continue to doubt the discipline's legitimacy. Technical analysis has actually only recently started to gain some general acceptance. While the majority of Wall Street analysts concentrate on the fundamental side, nearly every major brokerage today now employs technical analysts.

Efficient Market Hypothesis (EMH) is available in three variations. The current price in the first case, known as weak form efficiency, already includes all previous price information. Technical analysis can't forecast future movements, according to weak form efficiency, because all prior data has already been taken into consideration. As a result, examining the stock's historical price movements won't give any insight into how it will move in the future.

Fundamental analysis is likewise asserted to be of little assistance in identifying investment possibilities in the second, semi-strong form efficiency. The third component of this theory is strong form efficiency, which asserts that both technical and fundamental analysis cannot benefit investors because the stock price already takes into account all available information about the market.

Interpretation challenge: Technical analysis is not as straightforward as it first appears to be. The charts are intriguing to look at, but correctly reading them is really challenging. Long after the actual point in time, charts are always simple to interpret. Fundamentalists contend that palmistry and charting methods are identical as a result.

Frequent changes: Chart patterns are constantly altering as a result of market developments. As a result, technical analysts regularly change their minds about a particular investment. They posted a buy signal one day. They display a sell signal after noticing a changing trend a few weeks later.

Unreliable changes: Technical analysts' observations and analyses of changes in market behaviour may not always be accurate due to participant ignorance, intelligence, or manipulative inclinations. A trade may be conducted at a price below market value due to inaccurate information or poor judgement. The technicians suffer loses if they don't wait for confirmation. For stocks that are actively traded, prices may reflect a competition of wits rather than fundamental value. In the game of creating money, two savvy individuals could

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buy and sell each other in the hopes of gaining profit at the expense of the other players. If they are not smarter and lucky, many players in this game risk losing.

Less precise tools: The mechanical precision that technical analysis lends to the entire activity of investing in equities shares may be its greatest drawback. Nonetheless, mistakes, malfunctions, and misinterpretations are possible with the instruments.

3.5.3 Technical Analysis Instruments

The technician should be able to spot trends and recognise when one stops and prices begin to move in the opposite direction. His main issue is being able to tell the difference between trend reversals and actual trend changes. As prices do not move continuously and smoothly, this problem of classifying price changes is crucial.

Regarding stock groups or individual stocks, the two factors are:

two factors influence and contribute to price changes:

1. Price behaviour; and

2. Trading volume.

Because the general market has a consistent impact on stock prices, using technical "indicators" to gauge the direction of the entire market should come before any technical study of specific equities. However, some technicians believe that forecasting aggregates is more reliable because it can filter out individual errors.

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

In line with Dow "The market is always thought of as having three simultaneous movements. The first is the limited transition from day to day. The second is a brief swing lasting two weeks to a month or more, and the third is the primary movement lasting at least four years."

These movements are classified as under:

- Daily fluctuations (minor trends)
- Secondary movements (trends), and
- Primary trends

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The long-term cycle that moves the overall 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 foundation of the Dow Theory is the notion that stock price measures typically move in tandem. If the Dow Jones industrial average rises, so should the transportation average. Such simultaneous price changes signal a strong 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.

If, following a period of growing stock prices, one of the averages starts to decline, the two are in conflict. As an illustration, it's possible that the industrial average is rising while the transportation average is falling. 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. According to the Dow Theory, this difference indicates that this stage of the market is over and that overall securities prices will soon start to rise. The savvy investor will then buy securities in anticipation of a price increase.

These signals are illustrated in Figure 3.1. Part A that illustrates a buy signal. When the industrial starts to increase, both the transportation and industrial averages have been falling. The improvement in the industrial average shows that the downward market is finished, despite the fact that the transportation index is still falling. When the transportation average likewise starts to increase, this shift is then verified.

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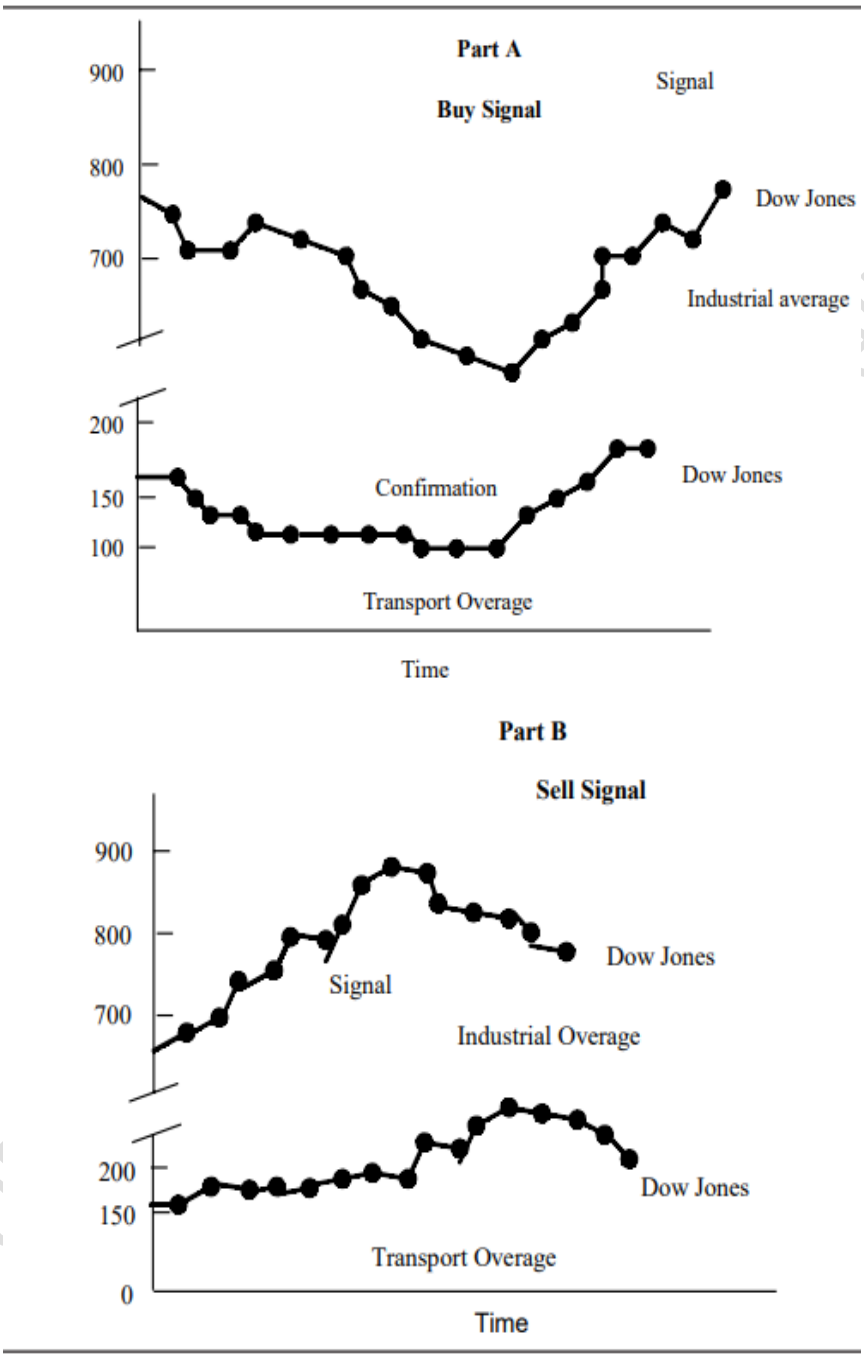

Figure 3.1: The Dow Jones Averages

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3.5.2 Technical Analysis: Chart types

One school of thought founded by William L. Jiler created a thorough method known as "Chart Reading." Charts offer visual assistance in identifying newly emerging and evolving pricing behaviour trends. Three fundamental chart types are used by technical analysts.

- Line Charts
- Bar Charts
- Candlestick Charts
- Point and Figure Charts

Line Charts: The line chart, which just displays closing prices over a specified time period, is the simplest straightforward of the four charts. By joining the closing prices over the time period, the line is created. For particular points like the high, low, and opening prices, line charts do not visibly display the trading range. Even though, line charts only use the closing price because it is generally seen to be more important than the high and low for the day in terms of stock data.

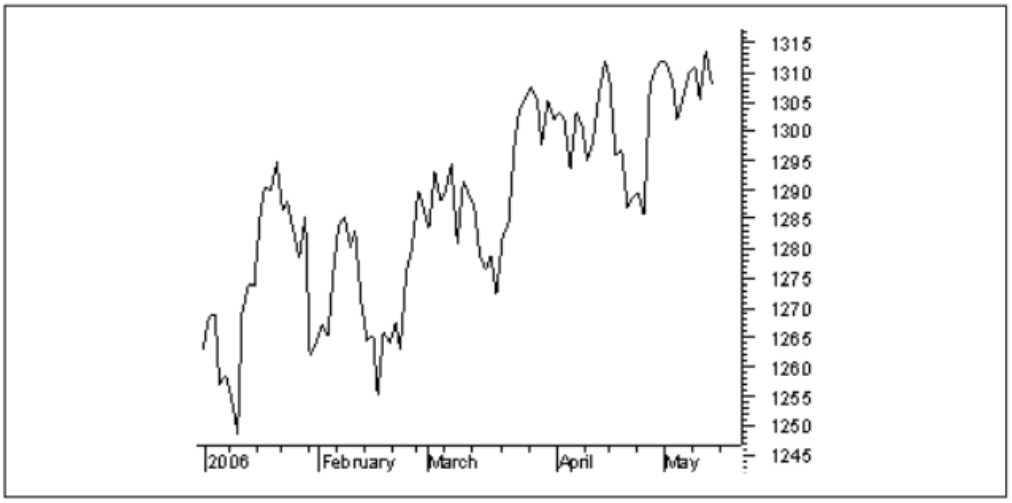

Figure 3.2: A Line Chart

Bar Charts: The majority of charting-interested investors utilise bar charts, partly because they are simple to create and because technical analysts are familiar with their meanings. The steps for creating a vertical line or bar chart are straightforward. Assume a trader were to plot a series of vertical lines on a piece of logarithmic paper, each line indicating the price changes over a specific time frame—a day, a week, or even a year. The horizontal dimension

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of the line represents time, while the vertical dimensions of the line reflect price. In a daily chart, for instance, each vertical line denotes the range of price activity for each day, and the chart as a whole may be one month long.

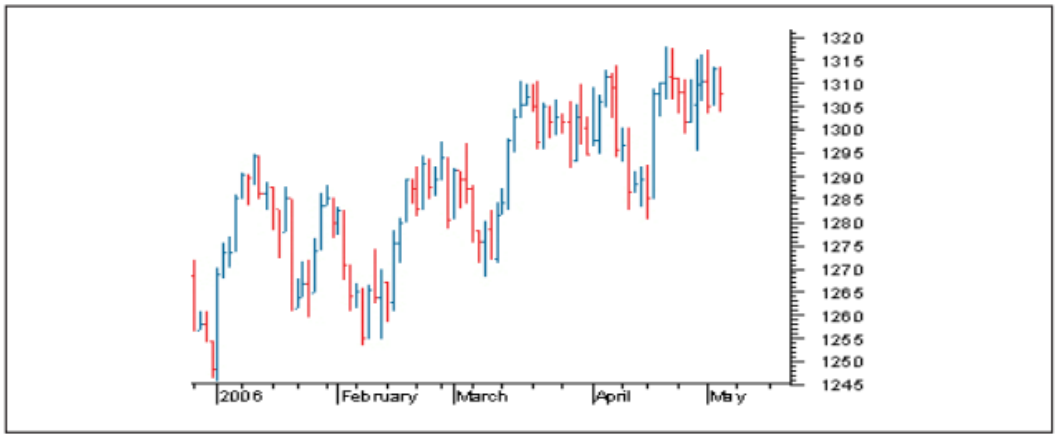

Figure 3.3: A Bar Chart

Candlestick Charts: While the Candlestick chart and bar chart share many similarities, they are graphically designed differently. The candlestick chart has a thin vertical line that depicts the period's trading range, just as the bar chart. The distinction between the open and close can be seen in the appearance of a wide bar on the vertical line. Candlesticks also significantly rely on the use of colour to describe what has transpired throughout the trading period, just like bar charts do. As there is a huge issue with the candlestick colour configuration—various sites use different standards—it is imperative to understand the candlestick design utilised at the chart site you are dealing with. There are two colour structures for price-up days and one for price-down days. Typically, a candlestick will be white or clear when the stock price is rising and closes above the beginning trade. The candlestick will typically be red or black, depending on the website, if the stock has gone lower for the period. The candlestick will be black or filled with the colour used to denote an upward day if the stock's price finished above the previous day's close but below the day's open.

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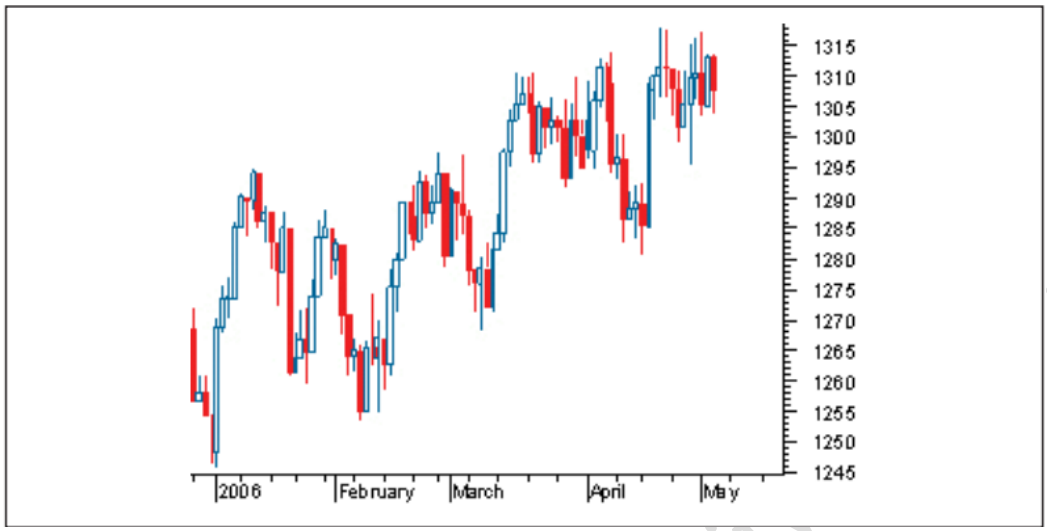

Figure 3.4: A Candlestick Chart

Point-and-Figure Chart: Bar chartists base their predictions of future price patterns on the discovery of specific purchasing and selling forces in the market. Three elements make up these forces: time, volume, and cost. Members of a different school, referred to as point-and-figure chartists, dispute the value of the first two elements. They contend that the only method to forecast future price changes is to study price movements. They claim that since no volume action needs to be recorded, it is likewise unnecessary to consider the day, week, or month as a time dimension. If only major price changes count, one only needs to record those that affect a stock's price by a significant amount—say, let's one point or more, disregarding fractions—regardless of how long it takes for the stock to reflect the change.

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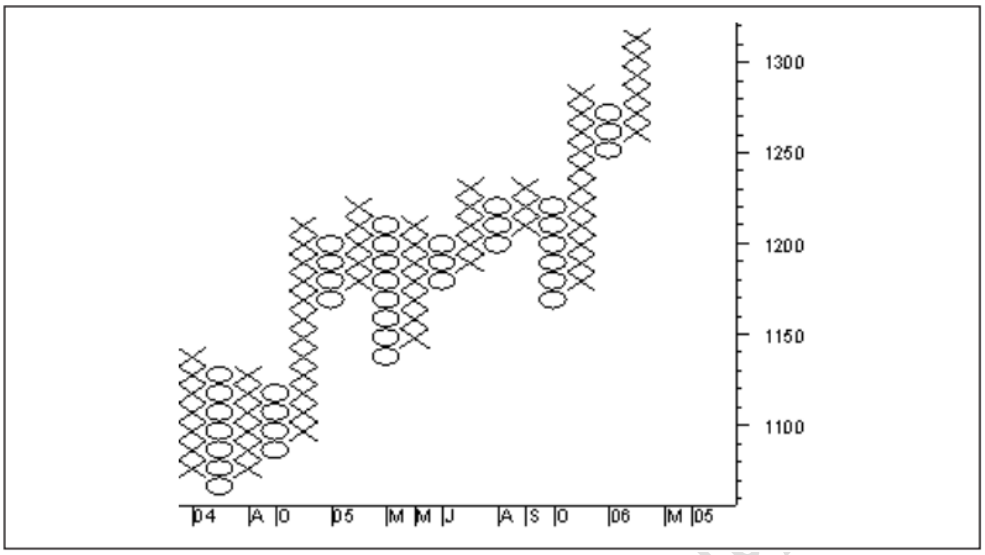

Figure 3.5: A Point-and-Figure Chart

3.5.3. Limitations of Charts

All of the major market shares' charts might be available to the technical analyst. But all that is required is a correct reading of the charts. Chart interpretation is quite similar to making a personal offer. It resembles abstract art in a certain way. If you show ten people an abstract painting, you will get at least eight distinct interpretations of what is seen. You might receive nearly as numerous assessments of the direction the stock is headed if you display one set of chart figures to ten chartists.

The issue with most chart patterns is that their adherents regularly alter their minds about them. Most chart services are constantly changing. They issue a strong buy signal one day, observe a pattern change two weeks later, advise their clients to sell, and then two weeks later, advise them to purchase again. As a result, these patterns repeatedly force their followers into and out of the market. Despite the fact that this is excellent for broker commissions, it's not so good for investors.

The fact that judgements are virtually always made only on the basis of the chart is another significant drawback of charting. Most buyers using this strategy are unaware of their motivations for purchasing a company's stock. They rely solely on the movement of a stock, presuming that those responsible for the movement actually understand the business. This is typically a bad way of thinking since, as more chartists become interested in a stock, there are simply more and more owners who are unaware of the business.

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Moving Average Convergence Divergence (MACD): One of the most popular and widely used indicators in technical analysis is the Moving Average Convergence Divergence (MACD). Two exponential moving averages that assist gauge the security's momentum make up this indicator. The difference between these two moving averages plotted against a centreline is all that the MACD is. The intersection of the two moving averages is known as the centreline. An exponential moving average of the MACD itself is also placed on the chart along with the MACD and the centreline. This momentum indicator's concept is to compare short-term momentum to long-term momentum in order to determine the current momentum's direction.

MACD = Shorter-term moving average – Longer-term moving average

The shorter-term moving average is above the longer-term moving average and shows upward momentum when the MACD is positive. When the MACD is negative, the converse is true; this indicates that the shorter-term is below the longer-term and suggests downward momentum. A crossing in the moving averages is shown when the MACD line crosses over the centreline. The 26-day and 12-day exponential moving averages are the two most often utilised moving average values in calculations. An exponential moving average of the MACD values over nine days is frequently used to construct the signal line. To suit the requirements of the technician and the security, these parameters might be changed. Shorter-term averages are employed for more volatile assets, whilst longer-term averages are used for less volatile securities.

The MACD histogram is another feature of the MACD indicator that is frequently seen on charts. The bars that make up the histogram are plotted along the centreline. The MACD's deviation from either the signal line or, more often than not, the nine-day exponential moving average is represented by a bar. The momentum behind the way the bars point increases with the height of the bars in either direction.

Relative Strength Index (RSI): Another widely used and well-known momentum indicator in technical analysis is the Relative Strength Index (RSI). Overbought and oversold circumstances in a security are signalled by RSI. The indicator is displayed on a graph with a range from 0 to 100. A rating of greater than 70 indicates that a security is overbought, and a reading of less than 30 indicates that it is oversold. This indicator aids traders in determining whether the price of a security has been unfairly driven to the current levels and whether a reversal may be imminent.

Aroon Oscillator: The Aroon oscillator, which plots the difference between the Aroon up and down lines by subtracting the two lines, is an elaboration of the Aroon. Then, this line is displayed between -100 and 100. One important signal line for identifying the trend is said to be the oscillator's centreline at zero. The security has more upward strength the farther the

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oscillator is from the centreline point; the more downward pressure there is, the farther the oscillator is from the centreline point.

3.6 EFFICIENT MARKET HYPOTHESIS

Because security prices react swiftly to the appearance of new information, the current prices of securities in an effective capital market reflect all information currently known about the security. For 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. Furthermore, the matter of how efficient capital markets is one of the most contentious issues in investment research. Current research in behavioural finance, which is increasing quickly and has significant consequences for the idea of efficient capital markets, has given the debate a new dimension. You must comprehend what "efficient capital markets" and "efficient market hypothesis (EMH)) entail because of the significance and controversies surrounding it. You ought to comprehend the analysis taken during experiments to test the EMH and findings from investigations that confirm or refute the concept The ramifications of these findings should also be considered as you research alternative investments and build your portfolio.

As was previously noted, in a functioning capital market, the prices of securities swiftly alter in reaction to the disclosure of new information, and as a consequence, the current security prices fairly represent all information that is currently available. This is known as an informationally efficient market, to be precise. Although the concept of an efficient capital market is very simple, we frequently overlook the justification for efficient capital markets. What presumptions lead to the assumption of an effective capital market? An essential component of an efficient market is that there must be a large number of profit-maximizing players who each independently evaluate and value securities. The release of new information about securities is assumed to occur at random, and the timing of each disclosure is typically unrelated to those of others. The third supposition, which holds that profit-seeking investors swiftly adjust asset values to account for the effects of new knowledge, is crucial. Despite the fact that it might not be optimal, the pricing adjustment is impartial. In other words, you can't always forecast whether the market will overcorrect or undercorrect; both can happen at the same time.

3.6.1 Efficient Market Hypothesis

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The random walk hypothesis, which claimed that fluctuations in stock prices happened arbitrarily, served as the foundation for the majority of the early works on efficient capital markets. This early academic study included a lot of empirical analysis but no theory to support it. Fama made an effort to integrate the growing body of actual data and formulate the theory in an article. According to the information set used, Fama separated the efficient market hypothesis (EMH) into three sub-hypotheses in his original article: (1) weak-form EMH, (2) semi-strong-form EMH, and (3) strong-form EMH. Fama split the empirical findings into three groups in a later review article, but he switched the empirical findings among the earlier categories. As a result, although organising the display of the data using the new categories, the discussion that follows uses the original categories.

The weak EMH assumes that all security market data, such as historical price sequences, rates of return, are fully reflected in the stock prices at the moment. This hypothesis implies that past rates of return and other historical market data should not have any relationship with future rates of return (that is, rates of return should be independent) because it assumes that current market prices already reflect all past returns and any other security market information. Thus, this hypothesis asserts that you should not benefit significantly from employing any trading rules that determine whether to buy or sell a security based on historical return rates or any other historical market data.

According to the semi-strong-form EMH, security prices quickly respond to the disclosure of all publicly available information, meaning that current security prices accurately reflect all publicly available information. The weak-form hypothesis is covered by the semi-strong hypothesis since all market data taken into account by the weak-form hypothesis, including stock prices, rates of return, and trading volume, is available to the public. Any non-market information, including stock splits, earnings and dividend releases, price-to-earnings (P/E) ratios, dividend-yield (D/P) ratios, price-to-book value (P/BV) ratios, and news about the economy and politics, is also considered public information. According to this theory, investors who make decisions based on significant new information that becomes public shouldn't experience above-average risk-adjusted profits from their trades because the share price already takes all such new information into account.

According to the strong-form EMH, stock prices accurately reflect all information obtained from both public and private sources. This indicates that no investment group enjoys monopolistic access to information crucial to the setting of pricing. It follows that no group of investors should be able to continuously generate above-average risk-adjusted rates of return, according to this premise. Both the weak form and the semi-strong form of the EMH are included in its strong form. The strong version EMH also assumes ideal markets, where all

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information is free and readily available to everyone at once, extending the assumption of efficient markets, in which prices respond quickly to the disclosure of new public information. There are five main sections in this unit. The first examines the reasons behind our expectation of efficient capital markets as well as the elements that go into creating a market where the values of securities reflect the information that is currently available. To make testing easier, the efficient market hypothesis has been broken down into three sub-hypotheses. The consequences of each of these three sub-hypotheses are discussed in the second section. Because it discusses the findings of multiple investigations, the third portion is the longest section. A substantial body of evidence backs the EMH, although an increasing number of other studies refute the theories, according to this analysis of the literature. The notion of behavioural finance, studies that have been conducted in this field connected to efficient markets, and the conclusions as they pertain to the EMH are all covered in the fourth section. The last section addresses what these findings suggest for a portfolio manager with access to either superior or inferior analysts, or for an investor who uses either technical analysis or fundamental analysis. We wrap up by briefly discussing the data supporting markets in other nations.

3.6.2 Forms of the Efficient Market Hypothesis

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

The hypothesis's earliest statement is this one. It asserts that all information on previous stock prices, trends, and volumes is currently reflected in current stock market prices. Hence, it is said that such historical data cannot be used to forecast stock prices in the future. Hence, it may appear like tomorrow's closing price is more likely to be 48 than 46 if the closing prices for consecutive days for the XYZ stock have been 43, 44, 45, 46, and 47, but this is untrue. Any information inferred by or included in the price sequence before it is completely reflected in the price of 47. The stock prices therefore resemble a random walk. (For this reason, the words Random Walk Hypothesis and Efficient Market Hypothesis are

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occasionally used synonymously.) Prices move across the charts more or less randomly as time goes on. Because the walk is random, the analyst cannot predict whether the price will increase or decrease from today's price tomorrow, next week, or even next year based on prior price movements.

Prices have no memory, and yesterday has nothing to do with tomorrow, as the pseudonymous "Adam Smith," author of The Money Game, put it. This sums up the weak form of the EMH. It is a crucial characteristic of such a market that one can get better results by tossing a coin than by spending time researching prior price trends or patterns.

We can therefore claim that the stock market is weak-form efficient if the random walk hypothesis is empirically verified. Any chartist effort that is based on previous price trends is useless in this situation.

In order to anticipate the future direction of prices, a reasonably large number of investors, traders, and speculators compete in a perfect securities market, which is the starting point for random walk theorists. It is also expected that everyone has easy access to current information that is important to the decision-making process at little to no expense. If we "idealise" these circumstances and presume that the market is fully competitive, equity prices at any given time would reflect the market's assessment of all information that is currently known and that becomes known. Price changes in a perfect market will be statistically independent of one another until new information is dispersed over time in a non-random manner, which we have no reason to assume. Does this imply that stock price fluctuations have zero mean on average if they behave like a sequence of outcomes from tossing a coin? No, not always. We actually anticipate finding a positive mean change in stock prices because stocks are risky.

3.6.3 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.

RUN TEST

Setting a Benchmark: A benchmark must often be set for tests of the EMH. The 'buy-and-hold' portfolio is the most typical benchmark.

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The Time Aspect Of course, the chosen time period or times can always be questioned. If it is determined that a trading rule did not function, a supporter of the rule may retort, "Of course my trading rule did not work throughout that period."

Kiss and Tell: Assume someone found an investment method that was effective and profitable. Why would they want to inform anyone else? He or she could attempt to monetize the method by penning a book or an investment newsletter, but keeping it a secret would likely be more profitable. Let's say a stock analyst notices that shares of companies starting with the letter K increase on Wednesdays and decrease on Fridays.

3.6.4 Are the Markets Efficient?

Talking about the impending demise of the previous EMH is hip today. We're not quite ready to put it to rest just yet, but there is plenty of evidence to the contrary, and more evidence seems to surface every day. The idea of market efficiency is also supported by a sizable body of evidence, though. However, even if the markets are not efficient in a theoretical sense, they might be in a more real-world sense. The majority of the world's financial markets are competitive, well-functioning institutions where it is uncommon to consistently see exceptional profits based on historical or open data.

A common joke involves a trader and a finance professor strolling down the street. The vendor stops to pick up a $500 bill that is laying on the ground. The financial expert asks, "Why bother? If that had actually been a 500 note, someone would have seized it already."

This joke can be used to summarise the argument for and against market efficiency. Uncritical acceptance of the EMH and consequent dismissal of all investment research and analysis as useless can leave a significant amount of money on the street for someone else.

3.7 SUMMARY

- Macroeconomic analysis, industry analysis, and company analysis are the three steps of a frequently recommended fundamental analysis process.
- The global economy must come first in a top-down study of a firm's prospects in a globalised corporate environment.

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- Demand side policies and supply side policies are the two main categories of macroeconomic policies.
- The two main instruments in demand side economics are monetary and fiscal measures.
- The analyst must examine several economic sectors in terms of various industries after completing an analysis of the economy and determining the path it is expected to go in the short, intermediate, and long terms. A consistent group of businesses makes up an industry.
- The following criteria will be taken into account by the securities analyst when evaluating the investment potential of the sector.
- So, it is imperative to carefully examine the quantitative and qualitative fundamentals of the company.
- Equity valuations are performed to assess a company's value in light of its current assets and competitive position.
- The Dividend Discount Model, Free Cash Flow Model, and Price-Earnings Ratio are equity valuation formulae.
- The totality of a company's tangible and intangible assets is its total equity.
- The phrase "technical analysis" is used to refer to a fairly broad range of methodologies, all of which are based on the idea that historical data on stock prices and trade volume can help an informed investor predict the future.
- It makes an effort to explain and predict changes in securities prices by focusing solely on market data as opposed to fundamental analyst's analysis of information about a company or its prospects.
- Fundamentalists base their selections on a security's quality, value, yield, and growth potential, as appropriate for their own investment objectives.
- They are worried about the foundation, the corporation's financial stability, the track record of revenue and profit growth, profitability, investment acceptance, and so on.
- In order to estimate the stock's future price and establish its current value, they finally interpret these data inductively.

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- Fundamentalists rarely anticipate significant gains in less than a year because they are patient.
- It shouldn't come as a surprise that they seriously doubt the legitimacy of the discipline and make fun of its adherents.
- The ratio of a group of lower-grade bonds to a group of higher-grade bonds is known as the confidence index.
- 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.
- According to the information set at hand, Fama separated the general efficient market hypothesis (EMH) and the empirical testing of the hypothesis into three sub-hypotheses: (1) weak-form EMH, (2) semi-strong-form EMH, and (3) strong-form EMH.
- Natural disasters may cause price changes, but if a private information release doesn't, we can assume that the stock price already reflects the information.
- A market portfolio is a portfolio made up of the weighted sum of each asset on the market, with the weights reflecting 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.

3.8 GLOSSARY

- ***Seasonal Industry:*** Firms that move closely with the rate of industrial expansion of the economy and fluctuate cyclically with economic fluctuations are included in this industry category.
- ***Protective Industry:*** It is a collection of businesses that grow steadily alongside the economy and drop less than the average rate of the economy during cyclical downturns.

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- ***Regression Analysis:*** The analyst or investor engages in this process in an effort to control the element that dictates the level of demand for the sector's output. Analyzing end-use demand is another name for this.
- ***Growth Industry:*** This sector of the economy is predicted to expand steadily, and its expansion may even be faster than the economy as a whole.
- ***Asset:*** something with economic value that a person or organisation owns, especially something that can be sold for cash.
- ***Confidence Index:*** It refers to the ratio of a set of relatively low bonds to a set of relatively high bonds.
- ***Indicators***: A security's price and volume-based computations called indicators are used to calculate things like money flow, trends, volatility, and momentum.
- ***Odd Lots:*** Stock operations of less than, approximately 100 shares.
- ***Efficient Capital Market***: 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.
- ***Market Portfolio***: Every form of asset that is currently available is represented in a market portfolio at a level equal to its market value.
- ***Market Value of an Investment***: An investment's current market price is referred to as its market value.

3.9 SELF-ASSESSMENT QUESTIONS

5. What are the macroeconomic environment's opportunities and threats? Provide more information.
6. What justifies an industry analysis by a security analyst?
7. Why conducts the portfolio manager's industry analysis?
8. Why is a company analysis necessary? Do we require the business analysis?
9. Can the historical profitability of the entire group of liquidity providers in a particular futures market be estimated? If not, why?

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10. Analyze the technical analysis critically and in detail.
11. What do you think about opponents who assert that technical analysis is a form of black magic?
12. Which market price indicator do you think is more accurate, and why?
13. Since technical analysis has been used in financial markets for more than a century, it is unlikely to be replaced any time soon. Comment.
14. How do you envision technical analysis developing in the future?
15. According to technicians, the market always repeats itself. Justify your position.
16. What do you think the technical staff's lack of commitment to the buy-and-hold strategy is?
17. Do you believe the capital markets to be effective? Whether or not?

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LESSON 4

FUNDAMENTALS OF VALUATION AND PORTFOLIO ANALYSIS

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STRUCTURE

4.1 LEARNING OBJECTIVES

- Understanding the concept of valuation of equity shares
- Determining the value of equity using the dividend discount model
- Understanding the relative valuation techniques of equity
- Understanding of the Capital Asset Pricing Model (CAPM)

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- Understanding the concept of bonds and their types
- Understanding and determination of bond prices and yield
- Understanding of the portfolio risk and return
- Understanding the Markowitz model

4.2 VALUATION OF EQUITY SHARES

Investments in stock markets are usually based on using either or both of the two investment strategies: active strategies or passive strategies. Using active strategy involves picking and investing in stocks which are undervalued whereas passive strategy is based on the premise that one cannot beat the market always to make profits in long run and therefore to invest in the broad-based market index. Active strategy requires selecting either the growth stocks or the undervalued stocks. The selection of such stocks is based on their independent or relative valuation. Main techniques used for the valuation of equity shares:

- Dividend Discount Model
- Relative Valuation Model

Dividend Discount Model

This model is the conventional method of assessing the value of a company's stock and is also known as the capitalisation of income method. It is based on the concept that the intrinsic value of any asset is the sum of the present value of the stream of cash inflows expected to occur from that asset. The intrinsic value is compared with the prevailing market price of the share and if the intrinsic value is higher, the share is a good investment opportunity.

$$V_0 = \frac{c_1}{(1+k)} + \frac{c_2}{(1+\mathrm{k})^2} + \frac{c_3}{(1+\mathrm{k})^3} + \cdots + \frac{c_n}{(1+\mathrm{k})^n}$$

Or,

$$V_0 = \sum_{\mathrm{t}=1}^{\mathrm{n}} \frac{C_t}{(1+\mathrm{k})^{\mathrm{t}}}$$

Where,

V_0 = Intrinsic value or the present value of an equity share based on discounted cash flows

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C_t = Cash flows expected from the share at time t

k = Required rate of return or the discount rate or the rate of capitalsation

However, using this model requires beforehand knowledge of the expected required rate of return of the investor and the estimation of the related cash flows related to the stock. The required rate of return is the minimum expected rate of return based on the risk profile of the investor and the prevailing risk-free rate. Estimating the future cash flows raises an important question: what all cash flows are to be considered apart from the timing and quantum of cash flows.

The **Dividend Discount Model** provides a solution to this question by valuing the equity share based on the dividend distribution on equity share by the company. In the context of equity valuation, dividend discount model works as the foundation. As per this model, estimated value of an equity share is:

$$V_0 = \frac{D_1}{(1+k)} + \frac{D_2}{(1+\mathrm{k})^2} + \frac{D_3}{(1+\mathrm{k})^3} + \cdots + \frac{D_n}{(1+\mathrm{k})^n}$$

Or,

$$V_0 = \sum_{\mathrm{t}=1}^{\mathrm{n}} \frac{C_t}{(1+\mathrm{k})^{\mathrm{t}}}$$

Where,

D_t = Divedend expected to be received from the share at time t

k = Required rate of return or the discount rate or the rate of capitalsation

The aforesaid model assumes different amount of dividend distribution at different time periods.

Assuming a constant dividend pay-out, the **Zero growth rate** case turns out to be a perpetuity.

$$V_0 = \frac{\mathrm{D}_0}{k}$$

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Where, D_0 is the constant dividend pay-out for all future periods.

Considering the constant growth in dividends, where dividends grow every year at a fixed rate-g, the value of the share using dividend discount model **(constant growth model)** is:

$$V_0 = \frac{D_1}{k - g}$$

Where, D_1 is the expected dividend pay-out at the end of year 1. This can also be rewritten as,

$$V_0 = \frac{E_1(1 - b)}{k - g}$$

Where,

E_1 is the expected earnings of year 1

b is the retention ratio.

When dividends grow at a varying rate, value of an equity share is given by:

$$V_0 = \sum_{t=1}^{5} \frac{D_0(1 + g_1)^t}{(1 + K_e)^t} + \sum_{t=6}^{\infty} \frac{D_5(1 + g_2)^{t-5}}{(1 + K_e)^t}$$

Where,

g_1 = growth rate in dividend for first 5 years

g_2 = growth rate in dividend for 5^{th} year onwards

Nonetheless, the dividend growth model suffers with many practical issues like it can be applied only for those companies which pay dividend and doesn't take into account the risk factor involved in forecasting growth rates of dividends.

For companies where dividend discount model cannot be used owing to non-payment of dividend the value of the share is determined by capitalising its earnings.

$$V_0 = \frac{E}{k}$$

Example 4.1

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The expected dividend at the end of current year on equity shares of X ltd is ₹ 88. The Cost of capital or the required rate of return is 15%. Determine the value of equity share if the dividend grows at a constant rate of 5%.

Solution: Value of equity share when the growth rate is constant is calculated by-

$$V_0 = \frac{D_1}{k - g}$$

$$V_0 = \frac{88}{.15 - .05}$$

$$V_0 = \frac{88}{.10} = 880$$

Thus, the value of equity share is ₹880.

Example 4.2

X ltd. forecasts a growth rate of 10 percent p.a. for next three years and them it is likely to fall and stabilise at 7 percent p.a. The dividend paid during last year was ₹ 5 and the desired rate of return of equity investors is 12 percent. Determine the value of the equity share of X ltd. as on date using intrinsic value model.

Solution: Intrinsic value of an equity share of X ltd. is the sum of the present values of (i) dividends during years 1 through 3 and (ii) the expected market price immediately after 3 years, based on constant growth rate of 7 percent per annum

Present value of dividends of year 1-3

Year	Dividend	PVIF(12%)	PV of dividend
1	5.5	.893	4.91
2	6.05	.797	4.82
3	6.65	.712	4.74
	Total		14.47

At the end of year 3, the market price of equity share will be

$$V_3 = \frac{D_4}{k_e - g}$$

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$$V_3 = \frac{7.13}{.12 - .07}$$

V_3=142.42

Present value of ₹ 142.42 = 142.42*.712 = 101.40

Intrinsic value of equity share as on date is ₹ 14.47+₹ 101.40 = ₹ 115.87

Example 4.3

The last dividend paid on equity shares of X ltd is ₹ 96. The opportunity cost of capital is 12%. Determine the value of equity share if the dividend remains constant.

Solution: Value of equity share when the growth rate is constant is calculated by-

$$V_0 = \frac{D_1}{k}$$

$$V_0 = \frac{96}{.12}$$

$$V_0 = 800$$

Thus, the value of equity share is ₹800.

4.3 RELATIVE VALUATION TECHNIQUES

Relative valuation techniques basically overcome the limitations of dividend discount model and can be used for companies which do not pay dividend. These techniques include the price earnings model and the price to book value ratio.

Price- Earnings Model (P/E based Model)

This model is also known as earnings multiplier model and is an alternative to dividend discount model, which requires estimation of the cash flows related to that stock and the estimation of the required rate of return. The price earnings ratio is given by:

$$P/E = \frac{Current\ Price\ per\ share}{recent\ EPS}$$

This is the reported price earnings ratio which cannot be used for determining fair price of the share rather we use expected P/E ratio and expected EPS.

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$$Value\ of\ a\ share = Expected\ \frac{P}{E} ratio \times Expected\ EPS$$

Expected P/E ratio is calculated using different approaches:

i. **Average P/E ratio:** Historical P/E ratios of a company are used to calculate the average P/E ratio which is a good estimate of expected P/E ratio
ii. **Using regression:** Regression analysis is used to forecast expected P/E ratio which may be determined using the market P/E ratio or by using various determinants of forecasting P/E ratio.

Price Earnings model also suffers from certain pitfalls as it uses earnings which are subject to various accounting methods used and also P/E ratio is susceptible to business cycles.

Example 4.4

The expected P/E ratio of X ltd for current year is ₹ 12. The standard P/E ratio of the industry, X ltd. belongs to is 16. Determine the value of equity share.

Solution: Value of equity share using earnings multiplier is given by-

$$V_0 = \text{Expected}\frac{\text{P}}{\text{E}} ratio \times Expected\ EPS$$

$$V_0 = 12 \times 16 = ₹192$$

Thus, the value of equity share is ₹192.

Price to Book Ratio: It's a ratio of current market price of equity share to book value per share. This ratio is also used to determine the fair value of a share using forecasted book value of a share based on forecasted financials statements.

Besides Price to book ratio, price to sales ratio and price to cash flow ratio are also used in determining equity valuation.

4.4 CAPITAL ASSET PRICING MODEL (CAPM)

Capital Asset Pricing Model Approach

Capital Asset pricing model (CAPM) explains how an asset can be priced in the capital market. Its' an alternative method to determine any security value. CAPM was originally developed to have a better understanding of the behaviour of security prices and offers a mean for investors to evaluate the influence of prospective investments in shares and other

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securities on their overall portfolio risk and return. It basically explains the risk reward trade-off for shares.

Assumptions of the CAPM approach:

i. There are no restrictions on investments.
ii. There are no transaction costs.
iii. Investors can borrow or lend any amount for their investment purposes at the risk-free rate.
iv. All investors have same (identical) expectations with respect to returns, variance and correlation of returns of all securities.
v. All investors have the same piece of information which is freely available in the market.
vi. Market prices cannot be significantly impacted by any single investor.
vii. No taxes exist on investments and income in the economy.
viii. Capital markets are in equilibrium.

As per CAPM approach, the investor is concerned with only the systematic risk (non-diversifiable risk) as the unsystematic risk (diversifiable) can be eliminated by the investor with the help of holding a diversified portfolio. As per CAPM, the systematic risk is of a security is measured in term of coefficient: beta. Beta (β) is a measure to compare how volatile a security's return is to the returns of a diversified (broad based) portfolio. Beta may be described as an indicator to depict how closely the return on a security/ investment moves with the return n market. Beta of a broad-based market portfolio is one. Beta coefficient of any security of one would mean that the risk of that specified security is same as that of the risk of the market. This means that the security returns completely move in the same direction and magnitude as of the market returns. A negative beta coefficient shows that the relationship is in the opposite direction. Beta coefficient of zero (0) indicates that there is no market related risk.

With the perspective of determining return on any asset, Capital Asset Pricing Model describes the association between the desired rate of return and the systematic (non-diversifiable) risk of the firm with the help of beta.

$$E_r = R_f + \mathbf{b}(R_m - R_f)$$

Where,

E_r = Expected return on any security

R_f = rate of risk free return

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b = beta coefficient of the security

R_m = return on market portfolio

Example 4.5

ABC ltd. wishes to determine expected return of its equity capital. The risk-free rate of return is 10 percent and the beta of the security is 1.7. The return expected on the market portfolio is17.5 percent.

Solution: As per CAPM, return on any security: $E_r = R_f + \mathrm{b}(R_m - R_f)$

E_r = .10+1.7 (.175-.10)

k_e = .10+.1275

k_e = .2275 = 22.75%

The CAPM approach of determining expected return considers risk in the form of beta coefficient which is completely ignored by the dividend discount model and also the CAPM approach helps in determining the value of equity for those firms who do not pay dividends.

However, CAPM faces practical difficulties in the right estimation of beta coefficient and the risk-free rate of return. Calculation of beta coefficient is complex and takes enormous time. Assumptions of CAPM are difficult to meet in real life. Still CAPM approach is considered better than the dividend discount model for equity valuation.

IN-TEXT QUESTIONS

1. Please indicate if the following statements are correct or incorrect

a) Beta is an indicator of unsystematic risk.

b) Dividend discount model estimates the value of a share based on estimated future dividend payments to owners.

c) Dividend discount model may be used for valuing stocks of firms which do not pay dividends

d) As per CAPM, volatile securities will have to provide for high return.

e) The plough back ratio is also referred as to be earnings retention ratio.

4.5 BOND FUNDAMENTALS

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Bonds are fixed income securities which have a specified payment schedule and a predetermined maturity period. These securities carry a fixed interest rates known as coupon rate and are issued for a fixed time period. Bonds are usually long-term debt instruments and owing to the fundamental characteristics of bonds, the bond buyer knows in advance about the future cash flows stream from purchasing and holding the security till maturity. Certain specific characteristics of the bonds are:

- Face Value: The value which is stated on the face of the bond is known as its face value and is also known as par value. Bonds are normally issued at par value.
- Maturity: The specified period of time at which the principal is repaid is known as maturity.
- Coupon rate: The specific interest rates every bond carries is known as coupon rate and usually denoted as annual interest rate. However, most bonds have a semi-annual interest pay out.
- Redemption Value: The amount which a bond holder gets on maturity of the bond is known as redemption value. A bond may be redeemed at premium, at discount or at par.
- Call Date: The date at which the bonds may be called (redeemed by the issuer before the maturity date).
- Call Price: Amount at which the bonds are called by the issuer or the payment which the issuer has to pay to the bondholder to call the bonds.
- Yield to call: The return a bondholder earns on buying a callable bond at the current market price and held till the date of the call of that bond.
- Yield to maturity: the return which the bondholder will earn if the bonds are purchased at current market price and held till maturity of the bond.
- Credit Rating: Bonds are rated by the rating agencies. High rating suggests less risk.

4.6 TYPES OF BONDS

- **Fixed Rate Bonds:** Bonds which carry a fixed rate of interest throughout its life irrespective of the market conditions.
- **Floating Rate Bonds**: Interest rates on these bonds are linked to certain benchmark and keeps changing as er the market conditions.
- **Government bonds**: Bonds which are issued by government or by the central bank of the country on behalf of the government. These bond issuances are meant to support government spending. These bonds are considered to be risk free.

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- **Corporate bonds:** Bonds which are issued by companies. Coupon rate on these bonds is a function of the credit rating of such bond issuers.
- **Perpetual Bonds**: Bonds where the principal repayment does not take place. These bonds do not have any maturity period. However, interest payment continues at specified regular intervals till perpetuity.
- **Convertible Bonds:** These bonds carry right to get the bond converted into predefined number of equity shares on a specified date. It gives discretion to the bondholder to exercise the right to convert or to keep the bond.
- **Zero Coupon Bonds:** There is no coupon rate on these bonds which means there is no payment of interest on these bonds periodically. Rather these bonds are issued at discount and redeemable at par. The difference between the two is yield for bondholders.
- **Inflation linked Bonds:** These bonds provide immunity against inflation by adjusting the principal as per the inflation rates and the interest amount automatically gets adjusted according to the principal.
- **Callable Bonds:** Bonds where the issuer have the right to call back the bonds at pre-agreed price. As such these bonds carry a higher interest rate than the normal.
- **Puttable Bonds:** Bonds where the bondholder has the right to give or return back the bonds at pre-agreed price. With this added character, the coupon rate is on lower side.

4.7 BOND PRICES

Valuation of bond is also similar to that of other securities. The price of a bond is equal to the present value of the stream of cash flow expected from holding of the bond. Cash flows related to the bond are the periodic payments of specified interest and the repayment of principal on maturity. These payments related to bondholding are discounted at an appropriate required yield.

$$P_0 = \sum_{t=1}^{n} \frac{C_t}{(1 + r)^t}$$

Where,

P_0 = Intrinsic value or the present value of security based on discounted cash flows

C_t = Cash flows expected at time t

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r = Required rate of return

In case of bond valuation, where the interest payments with their periodicity and the redemption value are known, fair value of the bond can be determined using:

$$P_0 = \sum_{t=1}^{n} \frac{C_t}{(1+r)^t} + \frac{RV}{(1+r)^n}$$

Where,

P_0 = Price of the bond today

C_t = interest payments expected at time t

RV= Redemption value of the bond

n = number of periods until maturity

r = Expected rate of return or market yield

Example 4.6

The face value of a bond with 5 years to maturity is ₹ 1000 and the coupon rate of interest is 9%. The opportunity cost of capital is 12%. Determine the value of bond if the bond matures at par.

Solution: Value of bond = present value of interest for 5 years and redemption value at maturity.

Annual interest payment for 5 years = ₹90

Redemption value after 5 years = ₹1000

Value of bond = ₹ 90 (PVIFA 12%, 5 years) + ₹1000 (PVIF12%, 5 years)

= ₹90 (3.604) + ₹1000(.5674)

= ₹324.36+₹567.4

= ₹891.76

Thus, the value of bond is ₹891.76.

Example 4.7

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The face value of a bond is ₹ 1000 and time to maturity is 6 years. The coupon rate of interest is 10% with semi-annual payment. The required rate of return is 11%. What amount should an investor be willing to pay of this bond if the bond matures at par.

Solution:

Semi-annual interest payment for 6 years = ₹50

Redemption value after 6 years = ₹1000

$$P_0 = \sum_{t=1}^{n=12} \frac{100/2}{(1+.11/2)^t} + \frac{1000}{(1+.11)^6}$$

Value of bond = ₹ 50 (PVIFA 5.5%, 12 years) + ₹1000 (PVIF11%, 6 years)

= ₹50 (8.62) + ₹1000(.5346)

= ₹431+₹534.6

= ₹965.6

Thus, the investor would be willing to pay for the bond ₹965.6.

4.8 BOND YIELD

While determining value of the bond, we used the required rate of return or the expected rate of return. However, the appropriate rate is the bond yield.

Current yield depicts the rate of return a bond earns when purchased at the current market price and receives the denominated coupon rate.

Current yield = Coupon interest/ Current market price

However, current yield is also not a true measure of return, rather the yield to maturity is.

Yield to maturity (YTM) is the compound rate of return, a bondholder will receive from holding of the bond purchased at the current market price if the bond is held till maturity and all the coupons received are reinvested at the calculated yield to maturity. Thus, YTM is the rate of return or the discount rate at which the present value of cash flows from holding a bond is equal to the current price of the bond.

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$$P_0 = \sum_{t=1}^{n} \frac{C_t}{(1+\text{YTM})^t} + \frac{RV}{(1+YTM)^n}$$

Example 4.8

The face value of a bond is ₹ 1000 and time to maturity is 9 years. The coupon rate of interest is 8% with annual interest payment. If the current market price of the bond is ₹850, what rate of return an investor earns if he purchases the bond currently from the market and holds it till the maturity.

Solution:

Annual interest payment for 9 years = ₹80

Redemption value after 9 years = ₹1000

P_0= ₹850

$$P_0 = \sum_{t=1}^{n} \frac{C_t}{(1+\text{YTM})^t} + \frac{RV}{(1+YTM)^n}$$

$$850 = \sum_{t=1}^{9} \frac{80}{(1+\text{YTM})^t} + \frac{1000}{(1+YTM)^n}$$

Solving this by trial and error (like the calculation of IRR) YTM = 10.67%

Instead of trial and error method, a close approximation of YTM can be made using

$$YTM = \frac{C+(M-P)/n}{.4M+.6P}$$

Where,
C= Coupon payment
M= Maturity value
P= Current market price
n= Years to maturity

Considering the same example as discussed above, approx. YTM will be

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$$YTM = \frac{80 + (1000 - 850/9}{.4 \times 1000 + .6 \times 850}$$

= YTM = 10.62%

For a zero-coupon bond, YTM calculation will be similar but without interest payment. The equation will turn out to be:

$$YTM = (RV/P)^{1/n} - 1$$

The concept of YTM is being criticised over its reinvestment rate assumption of intermittent interest payments received at YTM

4.9 MALKIEL'S THEOREM

Burton Malkiel derived some theorems showing the relationship of bond prices and bond yield.
As per Malkiel,

i. Bond prices are inversely related to bond yield, i.e. they move in opposite direction. This relationship is the basis for understanding of bond valuation and managing bond portfolio. Holding maturity constant, a decrease in rate will lead to rise in bond prices on a percentage basis more than a corresponding increase in rates will lower the bond price.
ii. Sensitivity of bond prices to change in interest rate will be more, for longer maturity periods.
iii. Price sensitivity of bond increases with maturity but at a decreasing rate.
iv. Lower the coupon rate on a bond, higher the sensitivity of its price to change in interest rates.
v. Decrease in yield will lead to rise in price by more amount than an increase in yield of the same amount reduces the price.

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IN-TEXT QUESTIONS

2. Fill in the blanks:

a) The value of a bond is the present value of …… and ……..

b) The value of a bond when close to maturity is equal to ..…….

c) If the required rate of return is greater than the coupon rate, the bond will be valued at…….

d) Interest rates on…….bonds keep changing.

e) Bond prices and bond yield are ……..related.

4.10 PORTFOLIO ANALYSIS

A famous proverb describes the portfolio in its best sense- "Never put all your eggs in one basket." This lays emphasis on holding portfolio rather than holding a security.

A portfolio is a mix of two or more investment securities. Investors do prefer to hold portfolio rather than investment in individual securities as it leads to diversification of risk.

Portfolio Management Process

Constructing a feasible portfolio for an investor and selecting the optimal portfolio is an important part of investment process or the portfolio management process. There may be many feasible portfolios but the most efficient is the one which gives maximum return for a given level of risk or minimum risk for a given level of return. Thus, to understand the optimal portfolio, understanding of the investor's risk return preferences is must. The optimal portfolio once determined also need revision with the change in the investment environment.
As a last step to portfolio management process evaluating the portfolio performance and its comparison to the benchmark portfolio or any similar portfolio is done. This evaluation may be done by simply using absolute return or using risk adjusted return measures like Sharpe ratio, Treynor's ratio or Jensen's alpha.

Portfolio Return

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Portfolio return is the aggregate of the return from holding the individual securities. The holding of individual securities give return in the form of periodic interest or dividend payment and capital gain in the form of increase in price of the security.

Portfolio return is the weighted average of the return of individual securities. While evaluating the performance of portfolios, historical returns should be used and while constructing a portfolio expected returns should be used.

Example 4.9

A portfolio consists of 4 securities A, B, C and D in the ratio of 40%, 20%, 30% and 10% and their respective returns are15%, 10%, 25% and -20%. Determine the portfolio return.

Portfolio return is the weighted average of the return of individual security.

R_p = .15 x.40 + .10 x.20 +.25 x .30 +(-.2) x.10 = .135= 13.5%

Historical return on this portfolio is 13.5%.

Portfolio Risk

Risk is the variability of return. In terms of portfolio, the risk is determined by the variance of each asset in the portfolio and the correlation between each pair of assets. To determine risk of a two-asset portfolio, we need the variances of these two assets and the correlation value of these assets with each other. The total portfolio risk measured by its standard deviation will be less than what we estimate by just using the weighted average of the asset variances. With increase in the number of assets in the portfolio, the complexity will increase as the number of correlation values of two asset pair amongst the group of assets would increase.

Portfolio risk in case of two asset portfolio is given by $\sigma = w_1^2\sigma_1^2 + w_2^2\sigma_2^2 + 2w_1w_2Cov$.

Therefore, to reduce the portfolio risk, the investor should add securities which have lower corelation with each other or such assets which have negative correlation with each other.

Markowitz Model

Harry Markowitz- a noble laureate gave a practical approach to selection of portfolio which is known as the Modern Portfolio Theory. It lays down a practical and more realistic method of selecting investments as to maximise return for a level of risk. The significant component of this theory is diversification. Markowitz laid that investors could get best return by choosing an optimal mix based on the individual risk appetite.

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The Modern Portfolio Theory lays that an investment's risk and return should not be considered in isolation rather it should be assessed based on the risk and return of the whole portfolio. An investor should design a portfolio which will give him higher returns without undertaking higher level of risk. Therefore, an investor should start with the desired level of expected return and build a portfolio involving lowest possible risk and still gives the expected return.

This theory allows investors to build efficient portfolios using graphs which illustrates the most ideal portfolio combinations. Suppose we have two portfolios, X with a return of 12% and standard deviation of 6% while portfolio Y which has return of 14% and the standard deviation of 6%. Portfolio Y is more efficient as it gives higher return for same risk.

On the graph denoting the most efficient portfolios, which can be connected giving an upward sloping curve known as efficient frontier.

However, Markowitz model is being criticised for evaluating portfolios based on variances rather than their downside risk.

4.11 SUMMARY

- The dividend discount model values the equity share by discounting the dividend distribution on equity share at the required rate of return.
- For Zero growth rate, $V_0 = \frac{D_0}{k}$
- When dividends grow at a fixed rate-g, (constant growth model): $V_0 = \frac{D_1}{k-g}$
- When dividends grow at a varying rate, value of an equity share is given by: $V_0 = \sum_{t=1}^{5} \frac{D_0(1+g_1)^t}{(1+K_e)^t} + \sum_{t=6}^{\infty} \frac{D_5(1+g_2)^{t-5}}{(1+K_e)^t}$
- Using earning multiplier model: $Value\ of\ a\ share = Expected\ \frac{P}{E} ratio \times Expected\ EP$
- Capital Asset Pricing Model describes the association between the desired rate of return and the systematic (non-diversifiable) risk of the firm with the help of beta. $E_r = R_f + \mathbf{b}(R_m - R_f)$
- **Beta** (β) is a measure to compare volatility of any financial assets return to the returns of a diversified portfolio.
- Bonds are fixed income securities which have a specified payment schedule and a predetermined maturity period.

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- Bond prices can be determined using $P_0 = \sum_{t=1}^{n} \frac{C_t}{(1+r)^t} + \frac{RV}{(1+r)^n}$
- YTM is the rate of return or the discount rate at which the present value of cash flows from holding a bond is equal to the current price of the bond.
- Bond prices are inversely related to bond yield. They move in opposite direction to each other.
- A portfolio is a mix of two or more investment securities.
- Portfolio return is the weighted average of the return of individual securities.
- Portfolio risk in case of two asset portfolio is given by $\sigma = w_1^2\sigma_1^2 + w_2^2\sigma_2^2 + 2w_1w_2Cov$.

4.12 ANSWERS TO IN-TEXT QUESTIONS

1. (a) incorrect	2.(a) interest payments, redemption value
(b) correct	(b) redemption value
(c) incorrect	(c) discount
(d) correct	(d) floating rate
(e) correct	(e) inverse

4.13 SELF-ASSESSMENT QUESTIONS

18. Discuss the Dividend discount model with all its variants.
19. What are the various problems being faced while using the dividend discount model?
20. Discuss in brief the relative valuation techniques of equity valuation.
21. What is CAPM? Also state its assumptions and limitations.
22. Briefly discuss the various types of bonds.
23. What are the various theorems stated by Malkiel regarding bond prices and bond yield.
24. State how yield to maturity is calculated.
25. State the valuation formula of bond with semi-annual interest payments.
26. Write short note on

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a) portfolio risk
b) portfolio returns

10 The expected dividend at the end of current year on equity shares of ABC ltd is ₹ 115. The opportunity cost of capital or the required rate of return is 14%. Determine the value of equity share if the dividend grows at a constant rate of 8%.

11 The face value of a bond is ₹ 1000 and time to maturity is 10 years. The coupon rate of interest is 8% with semi-annual payment. The required rate of return is 6 %. What would be the current market price of the bond if the bond matures at par.

12 The face value of a bond is ₹ 1000 and time to maturity is 6 years. The coupon rate of interest is 7% with annual interest payment. If the current market price of the bond is ₹920, what rate of return an investor earns if he purchases the bond currently from the market and holds it till the maturity.

4.14 REFERENCES

Fischer, D.E. & Jordan, R.J. Security Analysis & Portfolio Management, (6th edition)

Pearson Education.

Sharpe, W.F., Alexander, G.J. & Bailey, J. Investments, (6th edition), Prentice Hall of India.

4.15 SUGGESTED READINGS

Latest edition of the following text books to be used

Fischer, D.E. & Jordan, R.J. Security Analysis & Portfolio Management, (6th edition) Pearson Education.
Sharpe, W.F., Alexander, G.J. & Bailey, J. Investments, (6th edition), Prentice Hall of India.
Frank K Reilly & Keith C Brown, (2012) Analysis of Investments and Management of Portfolios (12th edition), Cengage India Pvt. Ltd.

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