

INVESTMENT AND PORTFOLIO MANAGEMENT

COURSE CODE: AcFn 3201

CREDIT HOUR: 2



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ARBAMINCH, ETHIOPIA

2012 E.C

ARBA MINCH UNIVERSITY
COLLEGE OF BUSINESS AND ECONOMICS
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**COURSE TITLE: INVESTMENT ANALYSIS AND
PORTFOLIO MANAGEMENT**

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Preface

When an individual's current money income exceeds his current consumption desires, he/she saves the excess. Rather than keep these savings in his possession, the individual may consider it worthwhile to forego immediate possession of the money for a larger future amount of consumption. This trade-off of present consumption for a higher level of future consumption is the essence of investment.

Learning investment management is a journey into a wealth of knowledge that is an exciting mix of the practical and the analytical-----knowledge about where, when, how, how much, to put our money to get superior future return. With most investments, an individual or business spends money today with the expectation of earning even more money in the future. The concept of risk - *return* provides investors with a convenient way of expressing the financial performance of an investment.

An investment is the current commitment of funds for a period of time in order to derive a future flow of funds that will compensate the investor for the time value of money, the expected rate of inflation over the life of the investment, and provide a premium for the uncertainty associated with this future flow of funds.

This module provides an overview of the field of investment .it explains basic concepts and methods useful in investment. The course also tries to imitate the valuation of bond and stocks. It also covers fundamental and technical analysis as well as portfolio construction and portfolio managements.

The course will enable students to understand different investment avenues and aware of the risk return of different investment alternatives and estimate the value of securities so as to make valuable investment decisions.

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CHAPTER ONE

INTRODUCTION TO INVESTMENT

Chapter Objectives:

After completing this chapter, the learner will be able to:

- Define what mean by investment
- Identify investment alternatives
- Define security markets
- Discuss different types of investment companies

1.1 Introduction

This chapter introduces you about Introduction to Investment. Learning investment management is a journey into a wealth of knowledge that is an exciting mix of the practical and the analytical. With most investments, an individual or business spends money today with the expectation of earning even more money in the future. The concept of *return* provides investors with a convenient way of expressing the financial performance of an investment.

The chapter is introductory and contains important institutional material focusing on the financial environment. It discusses the major players in the financial markets, provide an overview of the types of securities traded in those markets, and explain how and where securities are traded. Investment is the current commitment of dollars for a period of time in order to derive future payments that will compensate the investor for: the time the funds are committed, the expected rate of inflation, the uncertainty of the future payments. A speculator is someone who seeks to buy and sell in order to take advantage of market price oscillations. Gambling is the act of betting on an uncertain outcome whereas *investing* is the committing of money in order to earn a financial return.

Financial market is a market where financial assets are traded. The money market is a subsector of the fixed-income market. It consists of very short-term debt securities that usually are highly marketable. The securities in the money market are: Treasury Bills, Certificates of Deposit, Bankers' Acceptances, Commercial Paper, Brokers' Calls, Federal Funds Repos and Reverses, Eurodollars etc.

Capital market that consists of Bond market & Equity market.

The bond market is composed of longer-term borrowing instruments than those that trade in the money market. This market includes Treasury notes and bonds, corporate bonds, municipal bonds, mortgage securities, and federal agency debt. Equity securities also include common stock as ownership shares and preferred stocks.

Common stocks, also known as **equity securities** or equities, represent ownership shares in a corporation. Each share of common stock entitles its owner to one vote on any matters of corporate governance that are put to a vote at the corporation's annual meeting and to a share in the financial benefits of ownership.

The two most important characteristics of common stock as an investment are:

- ↳ Residual claim; means that stockholders are the last in line of all those who have a claim on the assets and income of the corporation.
- ↳ Limited liability; Limited liability means that the most shareholders can lose in the event of failure of the corporation in their original investment.

We can classify the customers of the investment environment into **three** groups;

- a) The household sectors
- b) The corporate sector, and
- c) The government sectors.

Financial assets and the markets in which they are traded play several crucial roles in developed economies. Financial assets allow us to make the most of the economy's real

assets. The role of financial assets and the markets in the economy can be classified as: Consumption timing, allocation of risk and separation of ownership and management. OTC (Over the Counter) is a stock exchange where securities transactions are made via telephone and computer rather than on the floor of an exchange.

The investment management process involves five steps based on how analyzing investment avenues such as risk, return, tax, marketability and conveniences of investment. These are; setting investment objectives, establishing an investment policy, selecting an investment strategy, selecting the specific assets, measuring and evaluating investment performance.

1.2 What is investment

Investment is the current commitment of birr for a period of time in order to derive future payments that will compensate the investor for:

- The time the funds are committed (Risk free rate)
- The expected rate of inflation (Inflation rate)
- The uncertainty of the future payments. (Default Risk)

Example: Assume that currently in Ethiopia risk free rate of return is 5%, expected inflation rate is 15% and default risk rate is 5%. Ato Abebe wants to invest on one Share Company. So, from the investment, he expects rate of return that cover all cost such as time value of money, inflation rate, and default risk ($5\% + 15\% + 5\% = 25\%$). Therefore, Ato Abebe expects at least 25% or more than 25% rate of return to invest on Share Company.

An “**investor**” can be an individual, a government, a pension fund, or a corporation. Similarly, this definition includes all types of investments, including investments by corporations in plant and equipment and investments by individuals in stocks, bonds, commodities, or real estate. People make an investment to earn a return from savings due to their deferred consumption. They want a rate of return that compensates them for the time, the expected rate of inflation, and the uncertainty of the return.

Investment versus Speculation

A speculator is someone who seeks to buy and sell in order to take advantage of market price oscillations (fluctuation). An investor is someone who buys securities so that they provide a good income or capital gain by virtue of them being based on something of real and increasing worth. An investment operation is one which, upon through analysis promises safety of principal and an adequate return. Operations not meeting these requirements are speculative. Investment is something that you have analyzed carefully and know that it will give you an adequate return, either through an increase in share value or through healthy dividends for the price you pay.

Another way to define investment is related to the way investors' value things. If you cannot value something, it is a speculation. The share of any company with no available information is speculative, the share of a company that you know enough about to be able to “value” it, even if you can’t do so with any great precision, is an investment if the market price is less than or equal to your valuation.

Speculator is somebody who buys something only because they think less informed person will pay more for it in the near future, as opposed to an investor, who buys it because analysis confirms that the investment is of high quality and/or good value, so it is worth holding

Investment versus Gambling

Gambling is the act of betting (gaming) on an uncertain outcome. *Investing* is the committing of money in order to earn a financial return. The definitions seem to indicate a higher element of chance or randomness in gambling, while investing appears to be more rational.

Investors are rational while gambler rarely depends upon hope/chance/. Investment include purchase of a property or equity (stock) that one might hold for many years or even decades and probably sell with considerable appreciation. For the most part, gambling always depends upon something happening by chance on a specific time.

An investment grows with time while gambling is over by some specified time. In short, time is the friend of the investor and the enemy of the gambler. An investing example would be the value of some property or asset that appreciates over time. Some gambling examples would be the end of a race, the end of a lottery, etc.

Investment requires skill. Gambling requires no skill although some degree of skill may be applied. The skill aspect cannot be over emphasized.

Investment minimizes risk while gambling maximizes risk. A common myth is that investment involves risk taking. That is overly simplistic. There are **two** kinds of risk: **smart risk** and **dumb risk**. Smart risk is good where as dumb risk is bad. The difference is that smart risk maximizes the probability of a good outcome while bad risk maximizes the probability of a bad outcome.

Investment return contributes to the economic growth of nation while income generated by gambling is at the expense of other so it is not contributes to the economic growth of nation.

Real Asset vs. Financial Asset

The material wealth of a society is determined ultimately by the productive capacity of its economy i, e. goods and services that can be provided to its members. This productive capacity is a function of the real assets of the economy: the Land, buildings, knowledge, and machines that are used to produce goods and the workers whose skills are necessary to use those resources. Together, “physical” and “human” assets generate the *entire spectrum of output produced and consumed by the society*.

Real assets determine the wealth of an economy, whereas **financial assets** only represent claims on real assets.

Financial assets do not represent a society’s wealth; instead, financial assets contribute to the productive capacity of the economy indirectly, because they allow for separation of the ownership and management of the firm and facilitate the transfer of funds to enterprises with attractive investment opportunities. Financial assets certainly contribute to the wealth

of the individuals or firms holding them. This is because, financial assets are *claims* to the income generated by real assets or claims on income from the government.

For example, Bondholders are entitled to a flow of income based on the interest rate and par value of the bond. Equity holders or stockholders are entitled to any residual income after bondholders and other creditors are paid. So, *real assets produce goods and services, whereas financial assets define the allocation of income or wealth among investors.*

Real and financial assets are distinguished operationally by the balance sheets of individuals and firms in the economy. Whereas real assets appear only on the asset side of the balance sheet, financial assets always appear on both sides of balance sheets. When we aggregate overall balance sheets, financial assets will cancel out, leaving only the sum of real assets as the net wealth of the aggregate economy.

Financial assets **are created and destroyed in the ordinary course of doing business.** For example, when a loan is paid off, both the creditor's claim (a financial asset) and the debtor's obligation (a financial liability) cease to exist. In contrast, real assets are destroyed only by accident or by wearing out over time.

1.3 Investment alternatives

Investment in any of the alternatives depends on the needs and requirements of the investor. Corporate and individuals have different needs. Before investing, these alternatives of investments need to be analyzed in terms of their risk, return, term, convenience, liquidity etc.

Equity Shares

Equity investments represent ownership in a running company. By ownership, we mean share in the profits and assets of the company but generally, there are no fixed returns. It is considered as a risky investment but at the same time, they are most liquid investments due to presence of stock markets.

Debentures or Bonds

Debentures or bonds are long term investment options with a fixed stream of cash flows depending on the quoted rate of interest. They are considered relatively less risky. Amount of risk involved in debentures or bonds is dependent upon who the issuer is. For example, if the issuer is government, the risk is assumed to be zero. Following alternatives are available under debentures or bonds:

- ↳ Government securities like Treasury bonds
- ↳ Savings bonds
- ↳ Public Sector Units bonds
- ↳ Debentures of private sector companies

Money Market Instruments

Money market instruments are just like the bonds but the time period is very less. It is generally less than 1 year. Corporate entities can utilize their idle working capital by investing in money market instruments. Some of the money market instruments are

- ↳ Treasury Bills
- ↳ Commercial Paper
- ↳ Certificate of Deposits

Mutual Funds

Mutual funds are an easy and tension free way of investment and it automatically diversifies the investments. Mutual fund is an investment mix of debts and equity and ratio depending on the scheme. They provide with benefits such as professional approach, benefits of scale and convenience. In mutual funds also, we can select among the following types of portfolios:

- ↳ Equity Schemes
- ↳ Debt Schemes

↳ Balanced Schemes

Life Insurance

Life insurances are one of the important parts of investment portfolios. Life insurance is an investment for security of life. The main objective of other investment avenues is to earn return but the primary objective of life insurance is to secure our families against unfortunate event of our death. It is popular in individuals. Other kinds of general insurances are useful for corporate. There are different types of insurances which are as follows:

- ↳ Endowment Insurance Policy
- ↳ Money Back Policy
- ↳ Whole Life Policy
- ↳ Term Insurance Policy

Real Estate

Every investor has some part of their portfolio invested in real assets. Almost every individual and corporate investor invests in residential and office buildings respectively.

Precious Objects

Precious objects include gold, silver and other precious stones like diamond. Some artistic people invest in art objects like paintings, ancient coins etc.

Financial Derivatives

Derivatives mean indirect investments in the assets. Derivatives market is growing at a tremendous speed. The important benefit of investing through derivatives is that it leverages the investment, manages the risk and helps in doing speculation. Derivatives include:

↳ Forwards

↳ Futures

↳ Options and

↳ Swaps etc.

Activity 1.1

1. What is an investment?
2. What are investment alternatives?

1.4 Investment Companies

A corporation or trust engaged in the business of investing the pooled capital of investors in financial securities. An investment company is a company whose main business is holding securities of other companies purely for investment purposes. The investment company invests money on behalf of its shareholders who in turn share in the profits and losses. Investment companies only exist to invest. They make a profit by buying and selling shares, property and other assets. An investment manager decides what assets to buy in order to build a diverse, managed portfolio. When you buy shares of an investment company you make an investment that includes a share of all those assets. It's a simple way of expanding your portfolio and spreading your risk. You're not investing alone. Different people contribute money to the company. When you invest in the company you become one of its shareholders. This means investment companies are a type of collective investment fund, like unit trusts. With an investment company:

- ↳ you gain access to a wider range of investments than you could normally buy yourself
- ↳ your investment is managed by an expert fund manager
- ↳ depending on the company you choose, you can invest in specific markets, industries or even small unlisted businesses which are at an early stage in their development

Investment companies are a type of collective investment fund. All collective investment funds have some benefits in common. All types of collective investment funds, including investment companies, give you:

↳ **Economies of scale**

When you buy shares, you have to pay dealing costs and admin fees, which can eat away at the value of your investment. In an investment company, all the investors pool their money and split the admin costs. You can end up paying much less.

↳ **Way to spread your risk**

Each investment company owns shares in a range of investments, so buying shares in only one investment Company effectively gives you a diversified portfolio. As you are not dependent on the success of just one or two investments, this spreads your risk.

↳ **A professional manager's expertise**

Each investment company uses professional management expertise.

↳ **A chance to invest small amounts**

You can invest small lump sum amounts or even invest monthly. Most companies are available through savings schemes run by their managers, some of which start from as little as Birr 20 a month. Put all these benefits together and you find that collective investments are an effective and efficient way to invest in a diverse range of assets. Investment companies share some common features with other collective investment funds such as unit trusts, but they have several special features that make them unique.

The most common type of Investment Company is the management investment company, which actively manages a portfolio of securities to achieve its investment objective. There are two types of management investment company: closed-end and open-end. The primary differences between the two come down to where investors buy and sell their shares - in the primary or secondary markets - and the type of securities they sell.

Closed-End Investment Companies: A closed-end investment company issues shares in a one-time public offering. It does not continually offer new shares, nor does it redeem its shares like an open-end investment company. Once shares are issued, an investor may purchase them on the open market and sell them in the same way. The market value of the closed-end fund's shares will be based on supply and demand, much like other securities. Instead of selling at net asset value, the shares can sell at a premium or at a discount to the net asset value.

Open-End Investment Companies: Open-end investment companies, also known as mutual funds, continuously issue new shares. These shares may only be purchased from the investment company and sold back to the investment company.

1.5 Financial Market and Instruments

Financial market is a market where financial assets are traded. Financial market can be classified as below based on the following different bases:

- By the maturity of the claim as: **Money market** (a market for debt securities with short maturity) and **Capital market** (a market for financial assets with longer maturities).
- By the type of financial claim as **Debt Market** and **Equity market**.
- By origin of securities as: **Primary** vs. **secondary** as Primary market (deals with new issues of securities) and Secondary market (exchanging previously issued securities).
- By organizational structure of market as: **auction market** (physical location where transactions are carried out on a trading floor. Trader enters verbal bids and offer simultaneously. New York stock exchange) and **over the counter trading** (market by interconnected computer e.g. NASDAQ stock exchange).
- Other market: it includes commodity market, derivative market, foreign exchange market and insurance market.

1.5.1 Security Market

1.5.1.1 Capital market

Capital markets are a market in which long term securities are traded. It can be classified in to two major groups. Those are: Debt Securities and Equity securities

1. Debt Securities

a. The Bond Market

A bond is a long-term contract under which a borrower agrees to make payments of interest and principal, on specific dates, to the holders of the bond. The bond market is composed of longer-term borrowing instruments than those that trade in the money market. This market includes treasury notes and bonds, corporate bonds, municipal bonds, mortgage securities, and federal agency debt. These instruments are sometimes said to comprise the fixed income capital market, because most of them promise either a fixed stream of income or a stream of income that is determined according to a specific formula. In practice, these formulas can result in a flow of income that is far from fixed. Therefore, the term “fixed income” is probably not fully appropriate. It is simpler and more straightforward to call these securities either debt instruments or bonds.

b. Treasury Notes and Bonds

The U.S. government borrows funds in large part by selling Treasury notes and Treasury bonds. T-note maturities range up to 10 years, whereas bonds are issued with maturities ranging from 10 to 30 years. Both are issued in denominations of \$1,000 or more. Both make semiannual interest payments called *coupon payments*. Aside from their differing maturities at issuance, the only major distinction between T-notes and T-bonds is that T-bonds may be callable during a given period, usually the last five years of the bond’s life. The call provision gives the Treasury the right to repurchase the bond at par value.

c. Federal Agency Debt

Some government agencies issue their own securities to finance their activities. These agencies usually are formed to channel credit to a particular sector of the economy that Congress believes might not receive adequate credit through normal private sources. Although the debt of federally sponsored agencies is not explicitly insured by the federal government, it is widely assumed that the government would step in with assistance if an agency neared default. Thus these securities are considered extremely safe assets, and their yield spread above Treasury securities is usually small.

d. International Bonds

Many firms borrow abroad and many investors buy bonds from foreign issuers. In addition to national capital markets, there is a thriving international capital market, largely centered in London, where banks of over 70 countries have offices. A *Eurobond* is a bond denominated in a currency other than that of the country in which it is issued. For example, a dollar-denominated bond sold in Britain would be called a Eurodollar bond. Similarly, investors might speak of Euro yen bonds, yen-denominated bonds sold outside Japan. Since the new European currency is called the euro, the term Eurobond may be confusing. It is best to think of them simply as international bonds.

e. Municipal Bonds

Municipal bonds are issued by state and local governments. They are similar to Treasury and corporate bonds except that their interest income is exempt from federal income taxation. The interest income also is exempt from state and local taxation in the issuing state.

There are basically two types of municipal bonds. These are *general obligation* bonds, which are backed by the “full faith and credit” (i.e., the taxing power) of the issuer, and *revenue bonds*, which are issued to finance particular projects and are backed either by the revenues from that project or by the particular municipal agency operating the project. Typical issuers of revenue bonds are airports, hospitals, and turnpike or port authorities. Obviously, revenue bonds are riskier in terms of default than general obligation bonds.

An *industrial development bond* is a revenue bond that is issued to finance commercial enterprises, such as the construction of a factory that can be operated by a private firm. In effect, these private-purpose bonds give the firm access to the municipality’s ability to borrow at tax-exempt rates.

f. Corporate Bonds

Corporate bonds are the means by which private firms borrow money directly from the public. These bonds are similar in structure to Treasury issues. They typically pay semiannual coupons over their lives and return the face value to the bondholder at maturity. They differ most importantly from Treasury bonds in degree of risk. Default risk is a real consideration in the purchase of corporate bonds. For now, we distinguish only among *secured bonds*, which have

specific collateral backing them in the event of firm bankruptcy; unsecured bonds, called *debentures*, which have no collateral; and *subordinated debentures*, which have a lower priority claim to the firm's assets in the event of bankruptcy.

Corporate bonds often come with options attached. *Callable bonds* give the firm the option to repurchase the bond from the holder at a stipulated call price. *Convertible bonds* give the bondholder the option to convert each bond into a stipulated number of shares of stock

1.5.1.2 Equity Securities

i. Common Stock as Ownership Shares

Common stocks, also known as *equity securities* or equities, represent ownership shares in a corporation. Each share of common stock entitles its owner to one vote on any matters of corporate governance that are put to a vote at the corporation's annual meeting and to a share in the financial benefits of ownership.

- ☞ The two most important characteristics of common stock as an investment are;
- ☞ Residual claim and
- ☞ Limited liability features.

Residual claim means that stockholders are the last in line of all those who have a claim on the assets and income of the corporation.

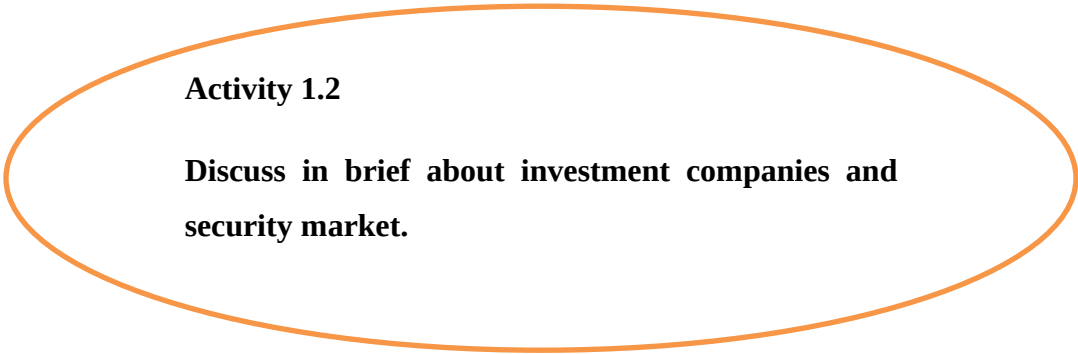
Limited liability means that the most shareholders can lose in the event of failure of the corporation is their original investment. Unlike owners of unincorporated businesses, whose creditors can lay claim to the personal assets of the owner (house, car, furniture), corporate shareholders may at worst have worthless stock. They are not personally liable for the firm's obligations (or cannot be liable beyond stock investment)

ii. Preferred Stock

Preferred stock has features similar to both equity and debt. Like a bond, it promises to pay to its holder a fixed amount of income each year. In this sense preferred stock is similar to an infinite-maturity bond, that is, perpetuity. It also resembles a bond in that it does not convey voting power regarding the management of the firm. Preferred stock is an equity investment, however. The firm

retains discretion to make the dividend payments to the preferred stockholders; it has no contractual obligation to pay those dividends. Instead, preferred dividends are usually *cumulative*; that is, unpaid dividends cumulate and must be paid in full before any dividends may be paid to holders of common stock. In contrast, the firm does have a contractual obligation to make the interest payments on the debt. Failure to make these payments sets off corporate bankruptcy proceedings.

Preferred stock also differs from bonds in terms of its tax treatment for the firm. Because, preferred stock payments are treated as dividends rather than interest, they are not tax-deductible expenses for the firm. Even though preferred stock ranks after bonds in terms of the priority of its claims to the assets of the firm in the event of corporate bankruptcy, preferred stock often sells at lower yields than do corporate bonds. Preferred stock is issued in variations similar to those of corporate bonds. It may be callable by the issuing firm, in which case it is said to be *redeemable*. It also may be convertible into common stock at some specified conversion ratio.



Activity 1.2

Discuss in brief about investment companies and security market.

1.5.2 The Money Market

The money market is a subsector of the fixed-income market. It consists of very short-term debt securities that usually are highly marketable. Many of these securities trade in large denominations, and so are out of the reach of individual investors. Money market funds, however, are easily accessible to small investors.

The securities in the money market are:

- | | |
|---------------------------------|---------------------|
| A. Treasury Bills | F. Repos & Reverses |
| B. Certificates of deposits(CD) | G. Federal Funds |
| C. Commercial papers | H. Broker's Calls |
| D. Banker's Acceptances | I. The LIBOR market |
| E. Eurodollars | |

1.6 Role of Financial Assets and Markets

Financial assets and the markets in which they are traded play several crucial roles in developed economies. Financial assets allow us to make the most of the economy's real assets.

The **role of financial assets** and **the markets** in the economy can be classified as follows:

1. Consumption Timing

Some individuals in an economy are earning more than they currently wish to spend. Others for example, retirees spend more than they currently earn. How can you shift your purchasing power from high-earnings periods to low-earnings periods of life? One way is to “store” your wealth in financial assets. In high-earnings periods, you can invest your savings in financial assets such as stocks and bonds. In low-earnings periods, you can sell these assets to provide funds for your consumption needs.

By so doing, you can shift your consumption over the course of your lifetime, thereby allocating your consumption to periods that provide the greatest satisfaction. Thus financial markets allow individuals to separate decisions concerning current consumption from constraints that otherwise would be imposed by current earnings.

2. Allocation of Risk

Virtually all real assets involve some risk. For example, if some company issues both stocks and bonds to the public, the more optimistic, or risk-tolerant, investors buy shares of stock in that company. The more conservative individuals can buy that company bond, which promise to provide a fixed payment. The stockholders bear most of the business risk along with potentially higher rewards.

This allocation of risk also benefits the firms that need to raise capital to finance their investments. When investors can self-select into security types with risk–return

characteristics that best suit their preferences, each security can be sold for the best possible price. This facilitates the process of building the economy's stock of real assets.

3. Separation of Ownership and Management

In case of large corporations, the shareholders are many in number. Such a large group of individuals obviously cannot actively participate in the day-to-day management of the firm. Instead, they elect a board of directors, which in turn hires and supervises the management of the firm. This structure means that the owners and managers of the firm are different. This gives the firm a stability that the owner-managed firm cannot achieve.

How can all of the disparate owners of the firm, ranging from large pension funds holding thousands of shares to small investors who may hold only a single share, agree on the objectives of the firm? Again, *the financial markets provide some guidance*. All may agree that the firm's management should pursue strategies that enhance the value of their shares. Such policies will make all shareholders wealthier and allow them all to better pursue their personal goals, whatever those goals might be.

Do managers really attempt to maximize firm value? It is easy to see how they might be tempted to engage in activities not in the best interest of the shareholders. For example, they might engage over consume luxuries such as corporate jets, reasoning that the cost of such perquisites is largely borne by the shareholders. These potential conflicts of interest are called **agency problems** because managers, who are hired as agents of the shareholders, may pursue their own interests instead.

Several mechanisms have evolved to mitigate potential agency problems. This includes:

- ✓ First, compensation plans tie the income of managers to the success of the firm.
- ✓ Second, force out management teams that are underperforming.
- ✓ Third, outsiders such as security analysts and large institutional investors such as pension funds monitor firms closely
- ✓ Finally, bad performers are subject to the threat of takeover. If the board of directors is careless in monitoring management, unhappy shareholders in principle can elect a different board.

Clients of the financial system

We can classify the customers of the investment environment into **three** groups;

- a. The household sector
- b. The corporate sector
- c. The government sector, and
- d. Financial intermediaries

This tracheotomy is not perfect; it excludes some organizations such as not-for-profit agencies and has difficulty with some hybrids such as unincorporated or family-run businesses. Nevertheless, from the standpoint of capital markets, the three-group classification is useful.

a. The Household Sector

Households constantly make economic decisions concerning such activities as work, job training, retirement planning, and savings versus consumption. Their financial decisions are concerned with how and where to invest money.

b. The Business Sector

Whereas household financial decisions are concerned with how to invest money, businesses typically need to raise money to finance their investments in real assets: plant, equipment, technological know-how, and so forth.

Broadly speaking, there are two ways for businesses to raise money they can borrow it, either from banks or directly from households by issuing bonds, or they can “take in new partners” by issuing stocks, which are ownership shares in the firm. Businesses issuing securities to the public have several objectives. First, they want to get the best price possible for their securities. Second, they want to market the issues to the public at the lowest possible cost.

c. The Government Sector

Like businesses, governments often need to finance their expenditures by borrowing. Unlike businesses, governments cannot sell equity shares; they are restricted to borrowing to raise funds when tax revenues are not sufficient to cover expenditures. They also can print money, of course, but this source of funds is limited by its inflationary implications,

and so most governments usually try to avoid excessive use of the printing press. Governments have a special advantage in borrowing money because their taxing power makes them very creditworthy and, therefore, able to borrow at the lowest rates.

d. Financial Intermediaries

Recall that the financial problem facing households is how best to invest their funds. The relative smallness of most households makes direct investment intrinsically difficult. A small investor obviously cannot advertise in the local newspaper his or her willingness to lend money to businesses that need to finance investments. Instead, financial intermediaries such as banks, investment companies, insurance companies, or credit unions naturally evolve to bring the two sectors together. The problem of matching lenders with borrowers is solved when each comes independently to the common intermediary

Financial Intermediaries direct funds from households to firms and from lenders to borrowers. Financial intermediaries are distinguished from other businesses in that both their assets and their liabilities are overwhelmingly financial.

- The role of financial intermediaries includes:
 - ✓ Resource pooling ; collection of financial assets
 - ✓ Diversification: transforming more risky assets into less risky ones
 - ✓ Specialized knowledge
 - ✓ Economies of scale: costs decrease with the increase in the quantity of output or the volume of activity.

1.7 How Securities are traded

The first time a security trades is when it is issued. Therefore, we begin our examination of trading with a look at how securities are first marketed to the public by investment bankers, the midwives of securities.

How Firms issue Securities

When firms need to raise capital, they may choose to sell (or *float*) new securities. These new issues of stocks, bonds, or other securities typically are marketed to the public by investment bankers in what is called the **primary market**. Here, there is new issue as well

as the issuer receives the proceeds from the sale. Purchase and sale of already issued securities among private investors takes place in the **secondary market**. After debt and equity securities are originally sold, they are traded in the secondary markets.

There are **two** types of primary market issues of common stock.

1. **Initial public offerings, or IPOs**, are stocks issued by a formerly privately owned company selling stock to the public for the first time. IPOs generally are underpriced and investment bankers generally are involved in the market after the initial offering of the stock.
2. **Seasoned new issues** are offered by companies that already have floated equity or it refers to a new issue where the company's securities have been previously issued. A seasoned new issue of common stock may be made by using a cash offer or a rights offer.

There are **two** types of **primary market** issues:

1. A **public offering**, which is an issue of stock or bonds sold to the general investing public that can then be traded on the secondary market; and
2. A **private placement**, which is an issue that is sold to a few wealthy or institutional investors at most, and, in the case of bonds, is generally held to maturity.

Private placements can be far cheaper than public offerings. This is because **Rule 144A** of the Securities & Exchange (SEC) allows corporations to make these placements without preparing the extensive and costly registration statements required of a public offering. On the other hand, because private placements are not made available to the general public, they generally will be less suited for very large offerings. Moreover, private placements do not trade in secondary markets such as stock exchanges. This greatly reduces their liquidity and most probably reduces the prices that investors will pay for the issue.

Investment Bankers and Underwriting

Investment banker are specialist in issuing securities as well as prospectus documents the new issue; indicates the terms of the issue, use of funds, and so forth. Public offerings of both stocks and bonds typically are marketed by investment bankers, who in this role are called **underwriters**. More than one investment banker usually markets the securities. A

lead firm forms an *underwriting syndicate* (diversification) of other investment bankers to share the responsibility for the stock issue. For corporate issuers, investment bankers perform services such as the following:

- Formulating the method used to issue the securities.
- Pricing the new securities.
- Selling the new securities.

The bankers advise the firm regarding the terms on which it should attempt to sell the securities. A preliminary registration statement must be filed with the Securities and Exchange Commission (SEC) describing the issue and the prospects of the company. This *preliminary prospectus* is known as a **red herring** because of a statement printed in red that the company is not attempting to sell the security before the registration is approved. When the statement is finalized and approved by the SEC, it is called the **prospectus**. At this time the price at which the securities will be offered to the public is announced.

In a typical underwriting arrangement, the investment bankers purchase the securities from the issuing company and then resell them to the public. The issuing firm sells the securities to the underwriting syndicate for the public offering price less a spread that serves as compensation to the underwriters. This procedure is called a **firm commitment**. The underwriters receive the issue and assume the full risk that the shares cannot in fact be sold to the public at the stipulated offering price.

An alternative to firm commitment is the **best-efforts agreement**. In this case the investment banker agrees to help the firm sell the issue to the public but does not actually purchase the securities. The banker simply acts as an intermediary between the public and the firm and thus does not bear the risk of being unable to resell purchased securities at the offering price. The best-efforts procedure is more common for initial public offerings of common stock, for which the appropriate share price is less certain.

Corporations engage investment bankers either by **negotiation** or by **competitive bidding**. Negotiation is by far more common. Besides, being compensated by the spread between the purchase price and the public offering price, an investment banker may receive shares of common stock or other securities of the firm.

Where Securities are traded

Once securities are issued to the public, investors may trade them among themselves. Purchase and sale of already-issued securities take place in the secondary markets, which consist of

1. National and local securities exchanges,
2. The over-the-counter market, and
3. Direct trading between two parties.

1. Trading on the Exchange Market

A stock exchange is an entity which provides "trading" facilities for stock brokers and traders, to trade stocks and other securities. It is an organized market for the sale and purchase of securities. An exchange provides a facility for its members to trade securities, and only members of the exchange may trade there. On the exchanges all trading takes place through a specialist, who arranges for the best bids to get the trade.

To be able to trade a security on a certain stock exchange, it has to be listed there. That is, the stocks must likewise meet and maintain certain requirements. Listing requirements are the set of conditions imposed by stock exchange upon companies that want to be listed on that exchange. Such conditions sometimes include minimum number of shares outstanding, minimum market capitalization, and minimum annual income. For an exchange, there is usually a central location at least for recordkeeping, but trade is less and less linked to such a physical place, as modern markets are electronic networks, which gives them advantages of increased speed and reduced cost of transactions. Trade on an exchange is by members only.

The stock can be exchanged either on national exchange, like New York Stock Exchange (NYSE) or Regional exchanges, like the American Stock Exchange (Amex). The national exchange are willing to list a stock (allow trading in that stock on the exchange) only if the firm meets certain criteria of size and stability. On the other hand, Amex focuses on listing smaller and younger firms than does the NYSE. Regional exchanges provide a market for trading shares of local firms that do not meet the listing requirements of the national exchanges.

The role of stock exchanges

Stock exchanges have multiple roles in the economy. This may include the following:

- ✓ ***Raising capital for businesses:*** it provides companies with the facility to raise capital for expansion through selling shares to the investing public.
- ✓ ***Mobilizing savings for investment:*** When people draw their savings and invest in shares, it leads to a more rational allocation of resources because funds, which could have been consumed, or kept in idle deposits with banks, are mobilized and redirected to promote business activity with benefits for several economic sectors such as agriculture, commerce and industry, resulting in stronger economic growth and higher productivity levels of firms.
- ✓ ***Facilitating company growth:*** Companies view acquisitions as an opportunity to expand product lines, increase distribution channels, hedge against volatility, increase its market share, or acquire other necessary business assets. A takeover bid or a merger agreement through the stock market is one of the simplest and most common ways for a company to grow by acquisition or fusion.
- ✓ ***Profit sharing:*** Both casual and professional stock investors, through dividends and stock price increases that may result in capital gains, will share in the wealth of profitable businesses.
- ✓ ***Corporate governance:*** By having a wide and varied scope of owners, companies generally tend to improve on their management standards and efficiency in order to satisfy the demands of these shareholders and the more stringent rules for public corporations imposed by public stock exchanges and the government. Consequently, it is alleged that public companies (companies that are owned by shareholders who are members of the general public and trade shares on public exchanges) tend to have better management records than privately held companies (those companies where shares are not publicly traded, often owned by the company founders and/or their families and heirs, or otherwise by a small group of investors).

- ✓ ***Creating investment opportunities for small investors:*** As opposed to other businesses that require huge capital outlay, investing in shares is open to both the large and small stock investors because a person buys the number of shares they can afford. Therefore the Stock Exchange provides the opportunity for small investors to own shares of the same companies as large investors.
- ✓ ***Government capital-raising for development projects***
- ✓ ***Barometer of the economy:*** At the stock exchange, share prices rise and fall depending, largely, on market forces. Share prices tend to rise or remain stable when companies and the economy in general show signs of stability and growth. An economic recession, depression, or financial crisis could eventually lead to a stock market crash. Therefore the movement of share prices and in general of the stock indexes can be an indicator of the general trend in the economy

Stock Market Participants

When an investor instructs a broker to buy or sell securities, a number of players must act to consummate the trade. Potential parties to an exchange trading include:

- ❖ ***Commission Broker:*** works for a company with a seat on the exchange. The investor places an order with a broker. The brokerage firm owning a seat on the exchange contacts its *commission broker*, who is on the floor of the exchange, to execute the order.
- ❖ ***Floor Broker:*** independent, freelance (temporary) broker; “farms out” to others. *Floor brokers* are independent members of the exchange who own their own seats and handle work for commission brokers when those brokers have too many orders to handle.
- ❖ ***Registered (floor) Trader:*** trades only for his or her own private account.
- ❖ ***Specialist:*** market maker; specializes in certain types of stocks (industries). The specialist is central to the trading process. Specialists maintain a market in one or more listed securities.

2. Trading on the over-the-counter (OTC) Market

OTC is a stock exchange where securities transactions are made via telephone and computer rather than on the floor of an exchange. Trades on the OTC market are negotiated directly through dealers. Each dealer maintains an inventory of selected securities. Dealers sell from their inventories at asked prices and buy for them at bid prices.

Stocks are traded in the OTC market because the company is small, making it unable to meet exchange listing requirements. OTC market is not a formal exchange. It is also known as "**unlisted stock**". There are no membership requirements for trading, nor are there listing requirements for securities. However, since OTC stocks are not considered large or stable enough to trade on a major exchange, they are usually very risky. They also tend to trade infrequently, making the bid-ask spread larger.

In the OTC market brokers must search the offers of dealers directly to find the best trading opportunity. Security dealers quote prices at which they are willing to buy or sell securities through the **Nasdaq** (the computer-linked network for trading of OTC securities). **Nasdaq**, began to offer immediate information on a computer-linked system of bid and asked prices for stocks offered by various dealers.

- ❖ The **bid price** is that at which a dealer is willing to purchase a security
- ❖ The **asked price** is that at which the dealer will sell a security.

The system allows a dealer who receives a buy or sells order from an investor to examine all current quotes, contact the dealer with the best quote, and execute a trade.

3. Insider Trading

One of the important restrictions on trading involves *insider trading*. Insider Trading is the trading in a security (buying or selling a stock) based on material information that is not available to the general public. It is prohibited by the US Securities and Exchange Commission (SEC) because it is unfair and would destroy the securities markets by destroying investor confidence. It is illegal for anyone to transact in securities to profit from **inside information**, that is, private information held by officers, directors, or major stockholders that has not yet been divulged to the public.

1.8 Investment Management Process

The investment management process involves the following **five steps** based on how to analyze investment avenues such as risk, return, tax, marketability and conveniences of investment.

Step 1: Setting investment objectives

Step 2: Establishing an investment policy

Step 3: Selecting an investment strategy

Step 4: Selecting the specific assets

Step 5: Measuring and evaluating investment performance

Step 1: Setting Investment Objectives

The first step in the investment management process, setting investment objectives, begins with a systematic analysis of the investment objectives of the entity whose funds are being managed. These entities can be classified as individual investors and institutional investors. Within each of these broad classifications a wide range of investment objectives are there;

The objectives of an individual investor may be to accumulate funds to purchase a home or other major acquisition, to have sufficient funds to be able to retire at a specified age, or to accumulate funds to pay for college tuition for children. An individual investor may engage the services of a financial advisor/consultant in establishing investment objectives.

Step 2: Establishing an Investment Policy

The second step in the investment management process is establishing policy guidelines to satisfy the investment objectives. Setting policy begins with the asset allocation decision. That is, a decision must be made as to how the funds to be invested should be distributed among the major classes of assets.

There are some institutional investors that make the asset allocation decision based purely on their understanding of the risk-return characteristics of the various asset classes and expected returns. The asset allocation will take into consideration any investment constraints or restrictions. Asset allocation models are commercially available for assisting those individuals responsible for making this decision.

Factors must be considered in the development of an investment policy:

- Client constraints
- Regulatory constraints
- Tax and accounting issues

Step 3: Selecting a Portfolio Strategy

Selecting a portfolio strategy that is consistent with the investment objectives and investment policy guidelines of the client or institution is the third step in the investment management process.

Portfolio strategies can be classified as either **active** or **passive**.

- **An active portfolio strategy** uses available information and forecasting techniques to seek a better performance than a portfolio that is simply diversified broadly. Essential to all active strategies are expectations about the factors that have been found to influence the performance of an asset class. For example, with active common stock strategies this may include forecasts of future earnings, dividends, or price-earnings ratios. With bond portfolios that are actively managed, expectations may involve forecasts of future interest rates and sector spreads. Active portfolio strategies involving foreign securities may require forecasts of local interest rates and exchange rates.
- **A passive portfolio strategy** involves minimal expectation input, and instead relies on diversification to match the performance of some market index. In effect, a passive strategy assumes that the marketplace will reflect all available information in the price paid for securities. Between these extremes of active and passive strategies, several strategies have sprung up that have elements of both. For example, the core of a portfolio may be passively managed with the balance actively managed.

Given the choice among active and passive management, which should be selected? The answer depends on;

- a. The client's or money manager's view of how "price efficient" the market is,

- b. The client's risk tolerance, and
- c. The nature of the client's liabilities.

By market place price efficiency mean how difficult it would be to earn a greater return than passive management after adjusting for the risk associated with a strategy and the transaction costs associated with implementing that strategy.

Step 4: Selecting the Specific Assets

Once a portfolio strategy is selected, the next step is to select the specific assets to be included in the portfolio. It is in this phase of the investment management process that the investor attempts to construct an efficient portfolio. An efficient portfolio is one that provides the greatest expected return for a given level of risk or, equivalently, the lowest risk for a given expected return.

Step 5: Measuring and Evaluating Performance

The measurement and evaluation of investment performance is the last step in the investment management process. Actually, it is misleading to say that it is the last step since the investment management process is an ongoing process. This step involves measuring the performance of the portfolio and then evaluating that performance relative to some benchmark.

Summary

- ☞ **Investment** is the current commitment of birr for a period of time in order to derive future payments that will compensate the investor for:
 - The time the funds are committed (Risk free rate)
 - The expected rate of inflation (Inflation rate)
- ☞ An “**investor**” can be an individual, a government, a pension fund, or a corporation. Similarly, this definition includes all types of investments, including investments by corporations in plant and equipment and investments by individuals in stocks, bonds, commodities, or real estate.
- ☞ Investment in any of the alternatives depends on the needs and requirements of the investor. Corporate and individuals have different needs. Before investing, these

alternatives of investments need to be analyzed in terms of their risk, return, term, convenience, liquidity etc.

- ☞ Equity investments represent ownership in a running company. By ownership, we mean share in the profits and assets of the company but generally, there are no fixed returns. It is considered as a risky investment but at the same time, they are most liquid investments due to presence of stock markets.
- ☞ Capital markets are a market in which long term securities are traded. It can be classified in to two major groups. Those are: **Debt Securities and Equity securities**
- ☞ A corporation or trust engaged in the business of investing the pooled capital of investors in financial securities.
- ☞ An investment company is a company whose main business is holding securities of other companies purely for investment purposes.
- ☞ The investment company invests money on behalf of its shareholders who in turn share in the profits and losses
- ☞ A bond is a long-term contract under which a borrower agrees to make payments of interest and principal, on specific dates, to the holders of the bond.

Self-test Exercise

Part I: True or False

Say true if the statement is correct or false if the statement is incorrect.

1. The ask price is that at which a dealer is willing to purchase a security.
2. Commercial paper is backed by a bank line of credit, which gives the borrower access to cash that can be used to pay off the paper at maturity.
3. An investment grows with time while gambling is over by some specified time.
4. Public offering is an issue that is sold to a few wealthy or institutional investors.
5. price oscillations whereas A speculator is someone who buys securities so that they provide a good income or capital gain by virtue of them being based on something of real and increasing worth.

Part II: Multiple Choice

Choose the best answer among the given alternatives

1. _____ is the present promise of dollars for a period of time in order to obtain future payments or returns from the investment.
 - A. Gambling
 - B. Investing
 - C. Speculation
 - D. All of the above
 - E. None of the above
2. _____ is a market / place where short term financial assets are traded.
 - A. Capital market
 - B. Bond market
 - C. Equity market
 - D. All of the above
 - E. None of the above
3. Which one of the following not true about real assets?
 - A. Real assets are determining the wealth of an economy.
 - B. Real assets only represent claims on financial assets.
 - C. Real assets are appreciated in value over the period.
 - D. All of the above
4. All of the followings are the role of financial assets and financial markets in the economy except:
 - A. Consumption Timing
 - B. Allocation of Risk
 - C. All of the above
 - D. None of the above
5. From the following which statement is true?
 - A. Secondary market is a market at which new issued securities are Purchased and sold.
 - B. Financial intermediaries are institutions that match Surplus spending units with deficit spending units.
 - C. Primary market is a market at which already issues of stocks, bonds, or other securities typically are marketed to the public by investment bankers.
 - D. All of the above
 - E. None of the above

Part III: Discussion Question

1. Discuss about Investment alternatives
2. Discuss investment company benefits

CHAPTER TWO

RETURN AND RISK

Chapter Objectives

After completing this chapter, the learner will be able to:

- Define what mean by investment Return & Risk
- Identify basic concept of return and its component, as well as investment risk, component and types
- Elaborate how risk and return is computed by classifying it as historical and ex-ante risk and return
- Define risk management and its tools
- Identify factors contribute to the rates of return that investors require on alternative investments
- Explain how do investors measure the rate of return on an investment & the risk related to alternative investments?

2.1 Introduction

Dear learners! In this chapter, we start from the basic premise that investors like returns and dislike risk. Therefore, people will invest in risky assets only if they expect to receive higher returns. We define precisely what the term *risk* means as it relates to investments. We examine procedures managers use to measure risk, and we discuss the relationship between risk and return.

The chapter includes an Over view and components of return, types of risk, measuring historical risk, measuring expected return and risk, Management of risk: derivatives and hedging.

Risk is how investors characterize *how much* uncertainty exists on return. It is the difference between expected return and actual return. Uncertainty means not knowing

exactly what will happen in the future because of change tax laws, consumer demand, the economy, or interest rates. Risk can be classified as *systematic risk* and *unsystematic risk*. Components of investment risk are: *Business Risk*, *Liquidity Risk*, *Financial Risk*, *Exchange Rate Risk*, *Country Risk*, and *Market Risk*. Risk management is a means of minimizing or avoiding risk by employing different tools of risk management. Those tools of risk management are diversification, derivatives and hedging. The above-mentioned issues are discussed in detail throughout a chapter.

2.2 Return an Over View and Component

Return is a reward and motivating force behind every investment. It is the amount or rate of gain or profit which accrues to an investment. The rate of return required by a firm to a great extent depends upon the risk involved, higher the risk, greater is the return expected by the firm. Return on investment has two components, regular income in the form of interest or dividend and capital appreciation (an increase in price).

Components of an Investor's Required Rate of Return

In financial theory, the rate of return at which an investment trades is the sum different components return. They are:

Real Risk-Free Interest Rate: This is the rate to which all other investments are compared. It is the rate of return an investor can earn without any risk in a world.

Inflation Premium: This is the rate that is added to an investment return to adjust for the market's expectation of future inflation. For example, the inflation premium required for a one year corporate bond might be a lot lower than a thirty year corporate bond by the same company because investors think that inflation will be low over the short-run, but pick up in the future as a result of the trade and budget deficits of years past.

Liquidity Premium: Thinly traded investments such as stocks and bonds in a family controlled company require a liquidity premium. That is, investors are not going to pay the full value of the asset if there is a very real possibility that they will not be able to dump

the stock or bond in a short period of time. The size of the liquidity premium depends upon an investor's perception of how active a particular market is.

Default Risk Premium: is premium paid to compensate faller of company to pay interest plus principal. When signs of trouble appear, a company's shares or bonds will collapse as a result of investors demanding a default risk premium. If someone were able to acquire assets that were trading at a huge discount as a result of a default risk premium that was too large, they could make a great deal of money.

Maturity Premium: is the reward for greater price fluctuation when interest rates change. It increases as maturity period of security increase.

2.3 Risk-An Overview, Components and Types of Risk

Whenever you make a financing or investment decision, there is some uncertainty about the outcome. **Uncertainty** means not knowing exactly what will happen in the future because of change tax laws, consumer demand, the economy, or interest rates. **Risk** is how investors characterize *how much* uncertainty exists on return. It is the difference between expected return and actual return.

2.3.1 Components of investment risk

Business Risk: The uncertainty of income caused by the nature of a company's business that measured by a ratio of *operating earnings* (income flows of the firm). The sources of business risk mainly arises from a companies' products/services, ownership support, industry environment, market position, management quality etc.

Liquidity Risk: The uncertainty introduced by the secondary market for a company to meet its future short term financial obligations. When an investor purchases a security, they expect that at some future period they will be able to sell this security at a profit and redeem this value as cash for consumption. Its ability to be redeemable for cash at a future date.

Financial Risk - Financial risk is the risk borne by *equity* holders (refer Shares section) due to a firms use of debt. If the company raises capital by borrowing money, it must pay back this money at some future date plus the financing charges (interest etc charged for

borrowing the money). This increases the degree of uncertainty about the company, because it must have enough income to pay back this amount at some time in the future.

Exchange Rate Risk - The uncertainty of returns for investors that acquire foreign investments and wish to convert them back to their home currency. This is particularly, important for investors that have a large amount of over-seas investment and wish to sell and convert their profit to their home currency. The more volatile exchange rates between the home and investment currency, the greater the risk of differing currency value that eroding the investments value.

Country Risk - This is also termed political risk, because it is the risk of investing funds in another country whereby a major change in the political or economic environment could occur. This could devalue your investment and reduce its overall return. This type of risk is usually restricted to emerging or developing countries that do not have stable economic or political arenas.

Market Risk - The price fluctuations or volatility increases and decreases in the day-to-day market. This type of risk mainly applies to both *stocks* and options and tends to perform well in a bull (increasing) market and poorly in a bear (decreasing) market. Generally with stock market risks, the more volatility within the market, the more probability of increase or decrease investment.

2.3.2 Types of Risk

There are a number of risks that can affect your investments. While some of these risks can be reduced through a number of avenues - some of them simply have to be accepted and planned for any investment decision. Based on this, there are two main types of risk; these are *systematic risk* and *unsystematic risk*.

Systematic risk: It is also called non-diversified risk. It is unavoidable. It may also be called a market risk. Is the risk that cannot be reduced or predicted in any manner and it is almost impossible to predict or protect yourself against this type of risk. Examples of this type of

risk include *interest rate increases* or *government legislation changes* recession, war, and structural changes in the economy.

Unsystematic Risk: is also called diversifiable risk or non-market risk. Unsystematic risk can be minimized or eliminated through diversification of security holdings. The variability in scrip's total return that is not related to the overall market variability is called unsystematic risk. It represents the portion of an investment risk that can be eliminated by holding diversified stocks. This risk occurs due to management changes in the company, labor problems, strikes etc.

Activity 2.1

Define and discuss meaning of risk and return.

2.4 Measuring historical risk

Risk refers to the possibility that the actual outcome of the investment will differ from the expected outcome. Put differently, risk refers to variability or dispersion. If an asset return has no variability, it is riskless. Suppose you are analyzing the total return of an equity stock over the period of time apart from knowing the mean return, you would also like to know about the variability of in returns. The most commonly used measures of risk in finance are variance or its square root the standard deviation. The variance and standard deviation of historical return series are defined as follows:

$$\delta^2 = \sum_{i=1}^n \left(\frac{R_i - \bar{R}}{n-1} \right)^2$$

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

Where: δ^2 = variance of return

δ = standard deviation of return

R_i = Return from the stock in period i ($=1, \dots, n$)

R^- = Arithmetic return

n = number of period

Example 3: Consider returns from the stock over a six years period. $R_1 = 15\%$, $R_2 = 12\%$, $R_3 = 20\%$, $R_4 = -10\%$, $R_5 = 14\%$ and $R_6 = 9\%$. Calculate the variance and standard deviation of return.

Solution:

Period	Return R_i	Deviation ($R_i - R^-$)	Square of deviation ($(R_i - R^-)^2$)
1	15	5	25
2	12	2	4
3	20	10	100
4	-10	-20	400
5	14	4	16
6	9	-1	1
$\sum_{i=1}^n R_i = 60$ $\sum_{i=1}^n (R_i - R^-)^2 = 546$ $R^- = 10$			

$$\sigma^2 = \sum_{i=1}^n \left(\frac{(R_i - R^-)^2}{n-1} \right) = \underline{\underline{109.2}}$$

$$\sigma = \sum_{i=1}^n \left(\frac{(R_i - R^-)^2}{n-1} \right)^{1/2} = \sum_{i=1}^6 \left(\frac{546}{6-1} \right)^{1/2} = \underline{\underline{10.4}}$$

2.5 Measuring Historical Return

Historical returns are frequently used to compare investment products or to provide an estimate of what future returns might be. There are many ways to measure the historical rate of return on an investment.

Total return: Defined as the percentage increase or decrease in the capital from the beginning of the period to the end of the period.

Assume first there are no cash flows during the period, i.e., no money is added or withdrawn. In this case, the total return may be obtained by the formula:

$$\text{Total Return} = (\text{Ending Capital} / \text{Starting Capital}) - 1$$

If the annual returns in each of the years are R_1 , R_2 , R_3 and R_N or if there is money added or withdrawn the total return is found by compounding or "linking" the two annual returns as follow:

$$\text{Total Return} = [(1 + R_1) * (1 + R_2) * (1 + R_3) * \dots * (1 + R_N)] - 1$$

Average annual return: Used to compare the performance of two investments with returns on periods of different lengths. The AR is found by taking the average of the yearly returns.

For N years with returns R_1 , R_2 , R_3 , and R_N , the average annual return is:

$$\text{Average Annual Return} = (R_1 + R_2 + R_3 + \dots + R_N) / N$$

Example1: A Birr 1,000 investment portfolio grows to Birr 1,600 at the end of one year and ends up at Birr 2,000 at the end of the second year. Compute:

- Each year rate of return
- Total rate of return and
- Average rate of return

Solution: a) 1st year and 2nd year return is calculated as:

$$1^{\text{st}} \text{ yr TR} = (\text{Ending Capital} / \text{Starting Capital}) - 1 = (1600/1000)-1$$

$$= \underline{\underline{60\%}}$$

$$2^{\text{nd}} \text{ yr TR} = (2000/1600)-1$$

$$= \underline{25\%}$$

$$\text{b) Total Return} = (\text{Birr } 2,000 / \text{Birr } 1,000) - 1 = 1 = \underline{100\%}$$

Alternatively, we could use the two annual returns to get the same result:

$$\text{Total Return} = (1 + 60\%) * (1 + 25\%) - 1 = 1 = \underline{100\%}$$

$$\text{c) Average Annual Return} = (60\% + 25\%) / 2 = 85\% / 2 = \underline{42.5\%}$$

Example2:

A Birr 1,000 investment appreciates 50% during the first year (to \$1,500) and then loses 50% the second year to settle at a final value of Birr 750. Compute:

- a. Each year rate of return
- b. Total rate of return and
- c. Average annual rate of return

Solution: a) 1st year and 2nd year return is calculated as:

$$1^{\text{st}} \text{ yr TR} = (\text{Ending Capital} / \text{Starting Capital}) - 1 = (1500/1000) - 1$$

$$= \underline{50\%}$$

$$2^{\text{nd}} \text{ yr TR} = (750/1500) - 1$$

$$= \underline{-50\%}$$

$$\text{b) Total Return} = (\text{Birr } 750 / \text{Birr } 1,000) - 1 = 1 = \underline{-25\%}$$

Alternatively, we could use the two annual returns to get the same result:

$$\text{Total Return} = (1 + 50\%) * (1 + (-50\%)) - 1 = 1 = \underline{-25\%}$$

$$\text{c) Average Annual Return} = (50\% - 50\%) / 2 = \underline{0\%}$$

The 50% loss in the second year has a bigger effect than the 50% gain in the first year. The general idea, which will return to later, is that one should be less impressed by positive

returns and more impressed with negative ones. As investment writers frequently mention, it takes a 100% positive return to make up for a 50% loss.

Activity 2.2

1. Discuss on measurement of components of risk
2. What are the different types of risk?

2.6 Measuring expected (ex-ante) return and risk

Expected rate of return: Investors estimate future rate of return based on historical return and by assigning probability to each year rate of return. The expected rate of return is the weighted average of all possible returns multiplied by their respective probabilities. In symbols,

$$E(R) = \sum_{i=1}^n R_i P_i$$

Where: $E(R)$ = expected return

R_i = return from the stock at year i

P_i = probability of return at year i

n = number of possible year

Expected risk: Risk refers to the dispersion of a variable. It is commonly measured by the variance or the standard deviation. The variance of the probability distribution is the sum of the squares of the deviations of the actual returns from the expected return, weighed by the associated probabilities. In symbols,

$$\sigma^2 = \sum P_i (R_i - E(R))^2$$

Where: σ^2 = variance

R_i = return for the i^{th} possible outcome

P_i = probability associated with the i^{th} possible outcome

$E(R)$ = expected return

Since variance is expressed as squared returns, it is somewhat difficult to grasp. So its square root, the standard deviation, is employed as an equivalent measure.

$\sigma = (\sigma^2)^{1/2}$ Where: σ = standard deviation

Example 4: The table below provides a probability distribution for the returns on stocks **A** and **B**. compute expected return and expected risk by using variance and standard deviation.

Year	Probability	Return on Stock A	Return on Stock B
1	20%	5%	50%
2	30%	10%	30%
3	30%	15%	10%
4	20%	20%	-10%

Solution: Expected return for stock A and B calculated as follows:

$$E[R]_A = .2(5\%) + .3(10\%) + .3(15\%) + .2(20\%) = 12.5\%$$

$$E[R]_B = .2(50\%) + .3(30\%) + .3(10\%) + .2(-10\%) = 20\%,$$

Based on expected return stock B will perform well than stock A, so investment manager selects and invest on stock B to get future better return.

Variance and Standard deviation on Stocks A and B:

Stock A =>

$$\sigma_A^2 = .20(.05 - .125)^2 + .30(.10 - .125)^2 + .30(.15 - .125)^2 + .20(.20 - .125)^2 = .00263$$
$$\sigma_A = \sqrt{.00263} = .0512 = 5.12\%$$

Stock B =>

$$\sigma_B^2 = .20(.50 - .20)^2 + .30(.30 - .20)^2 + .30(.10 - .20)^2 + .20(-.10 - .20)^2 = .04200$$
$$\sigma_B = \sqrt{.04200} = .2049 = 20.49\%$$

Based on expected risk, investor may select the second stock to minimize risk. Generally, the above result shows that as return increase risk also increase and investors select security based on their risk tolerance.

Summary

- ☞ Risk is the possibility of an unfortunate occurrence while return is a reward and motivating force behind every investment.
- ☞ Return is the amount or rate of gain or profit which accrues to an investment. The two components of return on investment are regular income in the form of interest or dividend and capital appreciation.
- ☞ Real Risk-Free Interest Rate is the basic interest rate, assuming no inflation and no uncertainty about future flows. Factors influence the exchange price are Subjective & Objective
- ☞ .The subjective factor is the time preference of individuals for the consumption of income and the objective factor that influences the RRFR is the set of investment opportunities available in the economy. Whenever you make a financing or investment decision, there is some uncertainty about the outcome. Uncertainty means not knowing exactly what will happen in the future.
- ☞ Risk is how investors characterize how much uncertainty exists on return. It is the difference between expected return and actual return.

- ☞ Investment risk has different Components. Those are: Business Risk is the uncertainty of income caused by the nature of a company's business that measured by a ratio of operating earnings. Liquidity Risk is the ability to be redeemable securities for cash at a future date without incurrence of much information & Transaction costs.
- ☞ Financial risk is the risk borne by equity holders due to a firm's use of debt. Exchange Rate Risk is the uncertainty of returns for investors that acquire foreign investments and wish to convert them back to their home currency. The more volatile exchange rates between the home and investment currency, the greater the risk of differing currency value that eroding the investments value. Country Risk also termed political risk, because it is the risk of investing funds in another country whereby a major change in the political or economic environment could occur.
- ☞ Market Risk is the price fluctuations or instability increases and decreases in the day-to-day market. There are two types of risks those are Systematic risk/ non-diversified risk /a market risk. It is unavoidable & cannot be reduced or predicted in any manner. Unsystematic Risk/ diversifiable risk / non market risk.
- ☞ Unsystematic risk can be minimized or eliminated through diversification of security holdings. Risk management is means of minimizing or avoiding risk by employing different tools of risk management.

Self-test Exercise

Part I: True or False

Say true if the statement is correct and false if the statement is incorrect

1. Systematic risk is unavoidable & cannot be reduced or predicted in any manner.
2. Real Risk-Free Interest Rate is assuming no inflation and no uncertainty about future flows.
3. Return is the amount or rate of gain or profit which accrues to an investment.

4. Business Risk is the uncertainty of income caused by the nature of a company's business that measured by a ratio of operating earnings.
5. Risk is the possibility of an unfortunate occurrence while return is a reward and motivating force behind every investment.

. Part II: Multiple Choice

Choose the best answer from the given alternatives

1. Among the following one is not a mechanism to manage a risk. Identify
 - A. Diversification
 - B. Derivatives
 - C. Hedging
 - D. All of the above
 - E. None of the above
2. _____ is the easy and ability to be exchangeable securities for cash at a future date.
 - A. Financial risk
 - B. Liquidity risk
 - C. Country risk
 - D. All of the above
 - E. None of the above
3. _____ is a call option pays the premium in return for the right to acquire the underlying asset at the exercise price.
 - A. Buying a Call
 - B. Call Option
 - C. Put Option
 - D. Hedging
 - E. A and C
 - F. B and D
4. _____ are those assets whose value is determined from the value of some underlying assets.
 - A. Forwards
 - B. Futures
 - C. Options
 - D. Swaps
 - E. All of the above
5. _____ is used to compare the performance of two investments with returns on periods of different lengths.
 - A. Total return
 - B. Average annual return

C. Both are correct

D. None of the above

Part III: Workout question

Q1. A Birr 1,000 investment grows to Birr 1,200 after one year. At that point, another Birr 1,000 is added and then at the end of second year it appreciates to Birr 3,300. Compute:

- a. Each year rate of return
- b. Total rate of return and
- c. Average annual rate of return

Q2. The Probability distributions of rate of return on Bharat foods stocks and oriental shipping stocks given on table below. Compute expected rate of return and risk (variance and standard deviation) on Bharat foods stocks and oriental shipping stocks. Which asset is best based on return and risk?

State of the economy	probability of occurrence	Bharat foods Rate of return (%)	Oriental shipping Rate of return (%)
Boom	0.30	16	40
Normal	0.50	11	10
Recession	0.20	6	-20

CHAPTER THREE

FIXED INCOME SECURITIES

Chapter Objectives:

After completing this chapter, the learner will be able to:

- Define what mean by fixed income security
- Identify characteristics of bond
- Calculate bond price and bond yield
- Identify risks in bond
- Evaluate and rating of bods
- Analyzing convertible bonds

3.1 Introduction

Fixed income securities (bonds) and their derivatives make up the largest segment of the global capital market. They play key roles in the allocation of scarce financial resources and the regulating of macroeconomic performance across countries, and are valuable sources of information for policymakers.

The literal definition of a fixed-income security is a financial instrument that promises fixed (or definite) payments at prescribed future dates. In some cases, only one payment is made at maturity; in other cases, periodic payments are made. Such a security is really a loan made by the purchaser of the security to the issuer of the security. The purchase price of the security is the principal of the loan. In order for such a security to be desirable to investors, the total amount of the future payments to be received must be greater than the purchase price, so that these payments reflect repayment of the original principal plus interest. The interest represents the price paid for the use of the borrowed money.

The payment amounts of the securities are typically described in terms of an interest rate. Roughly speaking, by a debt security we mean a financial security that is characterized by

a principal amount (the amount borrowed), together with a plan for repayment of the principal plus interest. Some debt securities have variable interest rates that depend on the future values of certain “economic variables” and are unknown when the security is issued.

3.2 Bond Characteristics

A bond is basically a loan issued by a corporation or government entity. The issuer pays the bondholder a specified amount of interest for a specified time, usually several years, and then repays the bondholder the face amount of the bond.

A bond can be characterized based on (1) its intrinsic features, (2) its type, (3) its indenture provisions, or (4) the features that affect its cash flows and/or its maturity.

Intrinsic Features; The coupon, maturity, principal value, and the type of ownership are important intrinsic features of a bond. The **coupon** of a bond indicates the income that the bond investor will receive over the life (or holding period) of the issue. This is known as *interest income, coupon income, or nominal yield*. Sometimes, however, **zero-coupon bonds** are issued that make no coupon payments. In this case, investors receive par value at the maturity date, but receive no interest payments until then: The bond has a coupon rate of zero. These bonds are issued at prices considerably below par value, and the investor’s return comes solely from the difference between issue price and the payment of par value at maturity. We will return to these bonds below.

The **term to maturity** specifies the date or the number of years before a bond matures (or expires). There are two different types of maturity. The most common is a **term bond**, which has a single maturity date. Alternatively, a **serial obligation bond** issue has a series of maturity dates, perhaps 20 or 25. Each maturity, although a subset of the total issue, is really a small bond issue with generally a different coupon. Municipalities issue most serial bonds.

The **principal**, or **par value**, of an issue represents the original value of the obligation. This is generally stated in \$1,000 increments from \$1,000 to \$25,000 or more. Principal value is *not* the same as the bond’s market value. The market prices of many issues rise

above or fall below their principal values because of differences between their coupons and the prevailing market rate of interest. If the market interest rate is above the coupon rate, the bond will sell at a discount to par. If the market rate is below the bond's coupon, it will sell at a premium above par. If the coupon is comparable to the prevailing market interest rate, the market value of the bond will be close to its original principal value. Finally, bonds differ in terms of ownership. With a **bearer bond**, the holder, or bearer, is the owner, so the issuer keeps no record of ownership. Interest from a bearer bond is obtained by clipping coupons attached to the bonds and sending them to the issuer for payment. In contrast, the issuers of **registered bonds** maintain records of owners and pay the interest directly to them.

Types of Issues: In contrast to common stock, companies can have many different bond issues outstanding at the same time. Bonds can have different types of collateral and be senior, unsecured, or subordinated (junior) securities. **Secured (senior) bonds** are backed by a legal claim on some specified property of the issuer in the case of default. For example, mortgage bonds are secured by real estate assets; equipment trust certificates, which are used by railroads and airlines, provide a senior claim on the firm's equipment. **Unsecured bonds (debentures)** are backed only by the promise of the issuer to pay interest and principal on a timely basis. As such, they are secured by the general credit of the issuer. **Subordinate (junior) debentures** possess a claim on income and assets that is subordinated to other debentures. Income issues are the most junior type because interest on them is paid only if it is earned. Although income bonds are unusual in the corporate sector, they are very popular municipal issues, where they are referred to as **revenue bonds**. Finally, **refunding issues** provide funds to prematurely retire another issue.

The type of issue has only a marginal effect on comparative yield because it is the credibility of the issuer that determines bond quality. A study of corporate bond price behavior found that whether the issuer pledged collateral did not become important until the bond issue approached default. The collateral and security characteristics of a bond influence yield differentials only when these factors affect the bond's quality ratings.

Indenture Provisions: The *indenture* is the contract between the issuer and the bondholder specifying the issuer's legal requirements. A trustee (usually a bank) acting on behalf of the bondholders ensures that all the indenture provisions are met, including the timely payment of interest and principal. All the factors that dictate a bond's features, its type, and its maturity are set forth in the indenture.

Features Affecting Bond's Maturity: Investors should be aware of the three alternative call option features that can affect the life (maturity) of a bond. One extreme is a *freely callable* provision that allows the issuer to retire the bond at any time with a typical notification period of 30 to 60 days. The other extreme is a *non-callable* provision where in the issuer cannot retire the bond prior to its maturity. Intermediate between these is a *deferred call* provision, which means the issue cannot be called for a certain period of time after the date of issue (e.g., 5 to 10 years). At the end of the deferred call period, the issue becomes freely callable. Callable bonds have a **call premium**, which is the amount above maturity value that the issuer must pay to the bondholder for prematurely retiring the bond. A *non-refunding provision* prohibits a call and premature retirement of an issue from the proceeds of a lower-coupon refunding bond. This is meant to protect the bondholder from a typical refunding, but it is not fool proof. An issue with a non-refunding provision can be called and retired prior to maturity using other sources of funds, such as excess cash from operations, the sale of assets, or proceeds from a sale of common stock.

Another important indenture provision that can affect a bond's maturity is the **sinking fund**, which specifies that a bond must be paid off systematically over its life rather than only at maturity. There are numerous sinking-fund arrangements, and the bondholder should recognize this as a feature that can change the stated maturity of a bond. The size of the sinking fund can be a percentage of a given issue or a percentage of the total debt outstanding, or it can be a fixed or variable sum stated on a dollar or percentage basis. Similar to a call feature, sinking fund payments may commence at the end of the first year or may be deferred for 5 or 10 years from date of the issue. The amount of the issue that must be repaid before maturity from a sinking fund can range from a nominal sum to 100 percent. Like a call, the sinking-fund feature typically carries a nominal premium but is

generally smaller than the straight call premium (e.g., 1 percent). For example, a bond issue with a 20-year maturity might have a sinking fund that requires that 5 percent of the issue be retired every year beginning in year 10. By year 20, half of the issue has been retired and the rest is paid off at maturity. Sinking-fund provisions have a small effect on comparative yields at the time of issue but have little subsequent impact on price behavior. A sinking-fund provision is an obligation and must be carried out regardless of market conditions. Although a sinking fund allows the issuer to call bonds on a random basis, most bonds are retired for sinking-fund purposes through direct negotiations with institutional holders. Essentially, the trustee negotiates with an institution to buy back the necessary amount of bonds at a price slightly above the current market price.

3.3 Bond Price

Because a bond's coupon and principal repayments all occur months or years in the future, the price an investor would be willing to pay for a claim to those payments depends on the value of dollars to be received in the future compared to dollars in hand today. This "present value" calculation depends in turn on market interest rates. The nominal risk-free interest rate equals the sum of (1) a real risk-free rate of return and (2) a premium above the real rate to compensate for expected inflation. In addition, because most bonds are not riskless, the discount rate will embody an additional premium that reflects bond-specific characteristics such as default risk, liquidity, tax attributes, call risk, and so on.

We simplify for now by assuming there is one interest rate that is appropriate for discounting cash flows of any maturity, but we can relax this assumption easily. In practice, there may be different discount rates for cash flows accruing in different periods. For the time being, however, we ignore this refinement.

To value a security, we discount its expected cash flows by the appropriate discount rate. The cash flows from a bond consist of coupon payments until the maturity date plus the final payment of par value. Therefore

Bond value = Present value of coupons + Present value of par value

If we call the maturity date T and call the discount rate r , the bond value can be written as

$$\text{Bond value} = \sum_{t=1}^T \frac{\text{Coupon}}{(1+r)^t} + \frac{\text{Par value}}{(1+r)^T}$$

Where t/T = the number of periods before the bond matures

r = interest rate

The summation sign in Equation directs us to add the present value of each coupon payment; each coupon is discounted based on the time until it will be paid. The first term on the right-hand side of Equation is the present value of an annuity. The second term is the present value of a single amount, the final payment of the bond's par value.

You may recall from an introductory finance class that the present value of a Birr 1 annuity that lasts for T periods when the interest rate equals r is

$$\frac{1}{r} \left[1 - \frac{1}{(1+r)^T} \right]$$

We call this expression the T -period *annuity factor* for an interest rate of r . Similarly, we

call $\frac{1}{(1+r)^T}$ *PV factor*, i.e., the present value of a single payment of Birr 1 to be received in T periods. Therefore, we can write the price of the bond as

$$\begin{aligned} \text{Price} &= \text{Coupon} \times \frac{1}{r} \left[1 - \frac{1}{(1+r)^T} \right] + \text{Par value} \times \frac{1}{(1+r)^T} \\ &= \text{Coupon} \times \text{Annuity factor}(r, T) + \text{Par value} \times \text{PV factor}(r, T) \end{aligned}$$

Example, XYZ Company issues 8% coupon, 30-year maturity bond with par value of Birr 1,000 paying semiannual coupon payments. Suppose that the interest rate is 8% annually,

and ABC Company wants to purchase this asset, by how much birr should ABC purchase the financial assets?

Solution:

Given $r = 8\%$, semiannually $8\%/2 = 4\%$

$T = 30$ year, the coupon paid twice in year, $30 \times 2 = 60$

Coupon = $1000 \times 0.04 = 40$

Principal = 1000

$$\sum_{t=1}^{60} \frac{40}{(1.04)^t} + \frac{1000}{(1.04)^{60}}$$

$40 \times \text{annuity factor}(4\%, 60) + 1,000 \times \text{PV factor}(4\%, 60)$

It is easy to confirm that the present value of the bond's 60 semiannual coupon payments of Birr 40 each is Birr 904.94, and that the Birr 1,000 final payment of par value has a present value of Birr 95.06, for a total bond value of Birr 1,000. So, ABC could purchase the financial asset at its face value.

In this example, the coupon rate equals the market interest rate, and the bond price equals par value. If the interest rate were not equal to the bond's coupon rate, the bond would not sell at par value. For example, if the interest rate were to rise to 10% (5% per six months), the bond's price would fall by 189.29, to 810.71, as follows

$40 \times \text{Annuity factor}(5\%, 60) + 1,000 \times \text{PV factor}(5\%, 60)$

$= \text{Birr } 757.17 + \text{Birr } 53.54 = \text{Birr } 810.71$

At a higher interest rate, the present value of the payments to be received by the bondholder is lower. Therefore, the bond price will fall as market interest rates rise. This illustrates a crucial general rule in bond valuation. When interest rates rise, bond prices must fall because the present value of the bond's payments is obtained by discounting at a higher

interest rate. The effect of interest rate changes on bond prices will vary from bond to bond and will depend upon a number of characteristics of the bond.

- ***The maturity of the bond*** - Holding coupon rates and default risk constant, increasing the maturity of a straight bond will increase its sensitivity to interest rate changes. The present value of cash flows changes much more for cash flows further in the future, as interest rates change, than for cash flows which are nearer in time.
- ***The coupon rate of the bond*** - Holding maturity and default risk constant, increasing the coupon rate of a straight bond will decrease its sensitivity to interest rate changes. Since higher coupons result in more cash flows earlier in the bond's life, the present value will change less as interest rates change. At the extreme, if the bond is a 'zero-coupon' bond, the only cash flow is the face value at maturity, and the present value is likely to vary much more as a function of interest rates.

A bond may be selling at par value when its coupon rate equals the market interest rate. In these circumstances, the investor receives fair compensation for the time value of money in the form of the recurring coupon payments. No further capital gain is necessary to provide fair compensation. When the coupon rate is lower than the market interest rate, the coupon payments alone will not provide investors as high a return as they could earn elsewhere in the market. To receive a fair return on such an investment, investors also need to earn price appreciation on their bonds. The bonds, therefore, would have to sell below par value to provide a “built-in” capital gain on the investment.

To illustrate build-in capital gains or losses, suppose a bond was issued several years ago when the interest rate was 7%. The bond's annual coupon rate was thus set at 7%. (We will suppose for simplicity that the bond pays its coupon annually.) Now, with three years left in the bond's life, the interest rate is 8% per year. The bond's fair market price is the present value of the remaining annual coupons plus payment of par value. That present value is:

$$\text{Birr } 70 * \text{Annuity factor } (8\%, 3) + \text{Birr } 1,000 * \text{PV factor } (8\%, 3) = \text{Birr } 974.23$$

-Which is less than par value.

In another year, after the next coupon is paid, the bond would sell at

$$\text{Birr } 70 * \text{Annuity factor } (8\%, 2) + \text{Birr } 1,000 * \text{PV factor } (8\%, 2) = \text{Birr } 982.17$$

Thereby yielding a capital gain over the year of Birr 7.94, if an investor had purchased the bond at Birr 974.23, the total return over the year would equal the coupon payment plus capital gain, or $\text{Birr } 70 + \text{Birr } 7.94 = \text{Birr } 77.94$. This represents a rate of return of $\text{Birr } 77.94 / \text{Birr } 974.23$, or 8%, exactly the current rate of return available elsewhere in the market. When bond prices are set according to the present value formula, any discount from par value provides an anticipated capital gain that will augment a below-market coupon rate just sufficiently to provide a fair total rate of return. Conversely, if the coupon rate exceeds the market interest rate, the interest income by itself is greater than that available elsewhere in the market. Investors will bid up the price of these bonds above their par values. As the bonds approach maturity, they will fall in value because fewer of these above-market coupon payments remain. The resulting capital losses offset the large coupon payments so that the bondholder again receives only a fair rate of return.

Activity 3.1

1. What is the characteristics of bonds?
2. **XIYA Company issues 12% coupon, 20-year maturity bond with par value of Birr 10,000 paying quarter coupon payments. Suppose that the interest rate is 8% annually, and BIC Company wants to purchase this asset, by how much birr should BIC purchase the financial assets?**

3.4 Bond Yields

We have noted that the current yield of a bond measures only the cash income provided by the bond as a percentage of bond prices and ignores any prospective capital gains or losses. We would like a measure of rate of return that accounts for both current incomes as well as the price increase or decrease over the bond's life. The yield to maturity is the standard measure of the total rate of return. However, it is far from perfect, and we will explore several variations of this measure. Nominal yield is the coupon rate of a particular issue. A bond with an 8% coupon has an 8% nominal yield. It therefore provides a convenient way of describing the coupon characteristics of the bond.

Yield to Maturity

In practice, an investor considering the purchase of a bond is not quoted a promised rate of return. Instead, the investor must use the bond price, maturity date, and coupon payments to infer the return offered by the bond over its life. The **yield to maturity** (YTM) is defined as the discount rate that makes the present value of a bond's payments equal to its price. This rate is often viewed as a measure of the average rate of return that will be earned on a bond if it is bought now and held until maturity. For example, suppose an 8% coupon, Birr 1000 par value, 30-year bond is selling at Birr 1,276.76. What average rate of return would be earned by an investor purchasing the bond at this price? We find the interest rate at which the present value of the remaining 60 semiannual payments equals the bond price. This is the rate consistent with the observed price of the bond. Therefore, we solve for r in the following equation

$$1,276.76 = \sum_{t=1}^{60} \frac{40}{(1+r)^t} + \frac{1000}{(1+r)^{60}} \quad \text{Or, equivalently,}$$

$$1,276.76 = 40 * \text{Annuity factor}(r, 60) + 1,000 * \text{PV factor}(r, 60)$$

These equations have only one unknown variable, the interest rate, r . You can use a financial calculator or spreadsheet to confirm that the solution is $r = .03$, or 3% per half-year. This is considered the bond's yield to maturity.

Yields annualized using simple interest is also called *bond equivalent yields*. Therefore, the semiannual yield would be doubled and reported in the newspaper as a bond equivalent yield of 6%. The *effective* annual yield of the bond, however, accounts for compound interest. If one earns 3% interest every six months, then after one year, each dollar invested grows with interest to $\$1 * (1.03)^2 = 1.0609$, and the effective annual interest rate on the bond is 6.09%. The bond's yield to maturity is the internal rate of return on an investment in the bond. The yield to maturity can be interpreted as the compound rate of return over the life of the bond under the assumption that all bond coupons can be reinvested at that yield. Yield to maturity therefore is widely accepted as a proxy for average return.

Yield to maturity differs from the current yield of a bond, which is the bond's annual coupon payment divided by the bond price. For example, for the 8%, 30-year bond currently selling at Birr 1,276.76, the current yield would be Birr 80/Birr 1,276.76 = 0.0627, or 6.27% per year. In contrast, recall that the effective annual yield to maturity is 6.09%. For this bond, which is selling at a premium over par value (Birr 1,276 rather than Birr 1,000), the coupon rate (8%) exceeds the current yield (6.27%), which exceeds the yield to maturity (6.09%). The coupon rate exceeds current yield because the coupon rate divides the coupon payments by par value (Birr 1,000) rather than by the bond price (Birr 1,276). In turn, the current yield exceeds yield to maturity because the yield to maturity accounts for the built-in capital loss on the bond; the bond bought today for Birr 1,276 will eventually fall in value to Birr 1,000 at maturity. This example illustrates a general rule: For **premium bonds** (bonds selling above par value), coupon rate is greater than current yield, which in turn is greater than yield to maturity. For **discount bonds** (bonds selling below par value), these relationships are reversed.

Yield to Call

Callable bonds, some corporate bonds are issued with call provisions, allowing the issuer to repurchase the bond at a specified *call price* before the maturity date. For example, if a company issues a bond with a high coupon rate when market interest rates are high, and interest rates later fall, the firm might like to retire the high-coupon debt and issue new bonds at a lower coupon rate to reduce interest payments. The proceeds from the new bond issue are used to pay for the repurchase of the existing higher coupon bonds at the call price. This is called *refunding*. Callable bonds typically come with a period of call protection, an initial time during which the bonds are not callable. Such bonds are referred to as *deferred* callable bonds. *Puttable bonds* while the callable bond gives the issuer the option to extend or retire the bond at the call date, the *extendable* or **put bond** gives this option to the bondholder. If the bond's coupon rate exceeds current market yields, for instance, the bondholder will choose to extend the bond's life. If the bond's coupon rate is too low, it will be optimal not to extend; the bondholder instead reclaims principal, which can be invested at current yields. *Floating-rate bonds* **Floating-rate bonds** make interest payments that are tied to some measure of current market rates. For example, the rate might be adjusted annually to the current T-bill rate plus 2%. If the one-year T-bill rate at the adjustment date is 4%, the bond's coupon rate over the next year would then be 6%. This arrangement means that the bond always pays approximately current market rates.

Yield to maturity is calculated on the assumption that the bond will be held until maturity. What if the bond is callable, however, and may be retired prior to the maturity date? How should we measure average rate of return for bonds subject to a call provision?

At high market interest rates, the risk of call is negligible because the present value of scheduled payments is less than the call price; therefore, the values of the straight and callable bonds converge. At lower rates, however, the values of the bonds begin to diverge, with the difference reflecting the value of the firm's option to reclaim the callable bond at the call price. At very low market rates the present value of schedule payments significantly exceeds the call price, so the bond is called.

This analysis suggests that bond market analysts might be more interested in a bond's yield to call rather than its yield to maturity, especially if the bond is likely to be called. The yield to call is calculated just like the yield to maturity, except that the time until call replaces time until maturity and the call price replaces the par value. This computation is sometimes called "yield to first call," as it assumes the issuer will call the bond as soon as it may do so.

Example: Suppose the Birr 1000 par value, 8% coupon semiannually, 30-year maturity bond sells for Birr 1,150 and is callable in 10 years at a call price of Birr 1,100. Its yield to maturity and yield to call would be calculated using the following inputs:

	<u>Yield to Call</u>	<u>Yield to Maturity</u>
Coupon payment	Birr 40	Birr 40
Number of semiannual periods	20 periods	60 periods
Final payment	Birr 1,100	Birr 1,000
Price	Birr 1,150	Birr 1,150

$$1150 = \sum_{t=1}^{40} \frac{40}{(1+r)^t} + \frac{1100}{(1+r)^{20}},$$

Yield to call is then 6.64%. In contrast, yield to maturity is 6.82%. Notice that redemption value is 110, i.e., 110% of par value.

We have noted that most callable bonds are issued with an initial period of call protection. In addition, an implicit form of call protection operates for bonds selling at deep discounts from their call prices. Even if interest rates fall a bit, deep-discount bonds still will sell below the call price and thus will not be subject to a call. Premium bonds that might be selling near their call prices, however, are especially apt to be called if rates fall further. If interest rates fall, a callable premium bond is likely to provide a lower return than could be earned on a discount bond whose potential price appreciation is not limited by the

likelihood of a call. Investors in premium bonds often are more interested in the bond's yield to call rather than yield to maturity as a consequence, because it may appear to them that the bond will be retired at the call date.

Horizon Yield

This measures the expected rate of return of a bond that you expect to sell prior to its maturity. It is therefore a total return measure which, allows the portfolio manager to project the performance of a bond on the basis of a planned investment horizon, his expectations concerning reinvestment rates and future market yields. This allows the portfolio manager to evaluate which of several potential bonds considered for investment will perform best over the planned investment horizon.

Using total return to assess performance over some investment horizon is called **Horizon Analysis** while the return calculated over the horizon is called **Horizon Yield or Return**.

The disadvantage of this approach for calculating return is that it requires the portfolio manager to make some assumptions about reinvestment rates, future yields and to think in terms of a specified period or horizon. It however enables the manager to evaluate the performance of a bond under different interest rate scenarios thereby assessing the sensitivity of the bond to interest rate changes.

Suppose you buy a 30-year, 7.5% (annual payment) coupon bond for Birr 980 (when its yield to maturity is 7.67%) and plan to hold it for 20 years. Your forecast is that the bond's yield to maturity will be 8% when it is sold and that the reinvestment rate on the coupons will be 6%. At the end of your investment horizon, the bond will have 10 years remaining until expiration, so the forecast sales price (using a yield to maturity of 8%) will be Birr 966.45. The 20 coupon payments will grow with compound interest to Birr 2,758.92. (This is the future value of a 20-year Birr 75 annuity with an interest rate of 6%.)

Based on these forecasts, your Birr 980 investment will grow in 20 years to Birr 966.45 + Birr 2,758.92 = Birr 3,725.37. This corresponds to an annualized compound return of 6.90%:

$$\text{Birr } 980(1+r)^{20} = \text{Birr } 3,725.37$$

$$r = 0.0690 = 6.90\%$$

Activity 3.2

1. What is yield to maturity?
2. What is yield to call?
3. What is the difference between yield to maturity and yield to call?

3.5 Risks in bond

Credit risk

Credit risk occurs when the issuer default on the payment of the coupon, and even the principal amount. This may occur if the issuer has problems meeting its obligations as promised. This is also known as default risk or issuer risk. Credit ratings try to estimate the relative credit risk of a bond based on the company's ability to pay. Credit rating agencies periodically review their bond ratings and may revise them if conditions or expectations change. The corporate bond contract (called an *indenture*) often includes terms called *covenants* designed to limit credit risk. For instance, the terms may limit the amount of debt the company can take on, or may require it to maintain certain financial ratios. Violating the terms of a bond may constitute a default. The bond trustee monitors the company's compliance with the terms of its indenture. The trustee acts on behalf of the bondholders and pursues remedies if the bond covenants are violated.

Interest Rate risk

The value of the bond is affected by interest rate changes. When interest rates rise, bond prices fall and vice versa. The longer the bond's maturity, the more time there is for rates to change and, as a result, affect the price of the bond. Therefore, bonds with longer maturities generally present greater interest rate risk than bonds of similar credit quality

that have shorter maturities. To compensate investors for this interest rate risk, long-term bonds generally offer higher interest rates than short-term bonds of the same credit quality. For example, imagine one bond that has a coupon rate of 2% while another bond has a coupon rate of 4%. All other features of the two bonds—when they mature, their level of credit risk, and so on—are the same. If market interest rates rise, then the price of the bond with the 2% coupon rate will fall by a greater percentage than that of the bond with the 4% coupon rate. *This makes it particularly important for investors to consider interest rate risk when they purchase bonds in a low-interest rate environment. We can summarize the observations about interest rate change in the following propositions:*

- ↪ *Bond prices and yields are inversely related: As yields increase, bond prices fall; as yields fall, bond prices rise.*
- ↪ *An increase in a bond's yield to maturity results in a smaller price change than a decrease in yield of equal magnitude.*
- ↪ *Prices of long-term bonds tend to be more sensitive to interest rate changes than prices of short-term bonds.*
- ↪ *The sensitivity of bond prices to changes in yields increases at a decreasing rate as maturity increases. In other words, interest rate risk is less than proportional to bond maturity.*
- ↪ *Interest rate risk is inversely related to the bond's coupon rate. Prices of low-coupon bonds are more sensitive to changes in interest rates than prices of high-coupon bonds.*
- ↪ *The sensitivity of a bond's price to a change in its yield is inversely related to the yield to maturity at which the bond currently is selling.*

Market Risk

The value of the bond is also subject to demand and supply forces. Should the bond market as a whole decline, the value of individual bonds may be brought down by market sentiments regardless of their fundamental characteristics. As such, this market risk is relevant if the investor decides to sell the bond and not hold it to maturity.

Inflation risk

Inflation is a general rise in the prices of goods and services, which causes a decline in purchasing power. With inflation over time, the amount of money received on the bond's interest and principal payments will purchase fewer goods and services than before.

Liquidity Risk

When there is a lack of buyers or sellers in the market, the investor may not be able to execute the trade or may be forced to trade at a value significantly away from the investor's desired price. This is liquidity risk. Liquidity is the ability to sell an asset, such as a bond, for cash when the owner chooses. Bonds that are traded frequently and at high volumes may have stronger liquidity than bonds that trade less frequently. Liquidity risk is the risk that investors seeking to sell their bonds may not receive a price that reflects the true value of the bonds (based on the bond's interest rate and credit-worthiness of the company). If you own a bond that is not traded on an exchange, you may have to go to a broker when you want to sell it. In addition, the bond market does not have the same pricing transparency as the equity market, as the dissemination of pricing information is more limited for corporate bonds in comparison to equity securities such as common stock.

Foreign exchange risk

The investor is exposed to fluctuations in foreign exchange rate when the investor trades in bonds that are denominated in a foreign currency. Foreign currency exchange rate may move adversely and may erode the returns on the bond investment.

Counterparty risk

There are counterparty risks for bonds which are traded over-the-counter (OTC). Counterparty risk is present when the party who goes into a trade or transaction does not fulfill its obligations. For this reason, OTC transactions may involve increased risks.

Call risk

Some bonds may have a “call provision” which give their issuers the option to redeem the bonds at a specified price prior to maturity. Declining interest rates may accelerate the redemption of a callable bond, where the investor’s principal will be returned earlier than expected. When this happens, the investor may have to reinvest the principal at a lower interest rate (or coupon rate). Investors are advised to consider all risks by reading the prospectus /information memorandum / term sheet or obtaining advice from a qualified financial adviser representative before they make a commitment to purchase any bonds.

3.6 Rating of bonds

If you invest in bonds, notes, or other debt instruments, you have probably come across credit ratings. These credit ratings usually appear in the form of alphabetical letter grades (for example, ‘AAA’ and ‘BBB’) and are intended to give you an estimation of the relative level of credit risk of a bond or a company or government as a whole.

Credit ratings can be a useful item of information to consider when evaluating an investment along with other information. But if you use credit ratings, you should understand their limitations. You should not base your investment decision solely on a credit rating or treat a credit rating as if it were investment advice.

A bond rating is a grade given to bonds that indicates their credit quality. Private independent rating services such as Standard & Poor's, Moody's and Fitch provide these evaluations of a bond issuer's financial strength, or it’s the ability to pay a bond's principal and interest in a timely fashion. A credit rating is an assessment of an entity’s ability to pay its financial obligations. The ability to pay financial obligations is referred to as “creditworthiness.” Credit ratings apply to *debt* securities like bonds, notes, and other debt instruments (such as certain asset-backed securities) and do not apply to *equity* securities like common stock. Credit ratings also are assigned to companies and governments.

The entity whose creditworthiness is being assessed typically is referred to as an obligor or issuer. Obligor include entities such as corporations, financial institutions, insurance

companies, or municipalities that have been rated by a credit rating agency. Credit ratings generally reflect a relative ranking of credit risk. For example, an obligor or debt security with a high credit rating is assessed by the credit rating agency to have a lower likelihood of default than an issuer or debt security with a lower credit rating. Credit rating scales, symbols, and definitions may vary among credit rating agencies. Credit ratings typically are expressed on a scale of alpha and/or numeric symbols, and these symbols are defined by the particular credit rating agency issuing those ratings. A typical credit rating scale, as shown in the table below, has a top rating of ‘AAA’ and may have a lowest rating of ‘D’ (indicating default). Some credit rating agencies’ scales distinguish between investment grade and non-investment grade (i.e., “speculative” or “high yield”) ratings and they draw this distinction between the ‘BBB’ and ‘BB’ rating categories (in other words, a rating that is ‘BBB-minus’ or higher is investment grade and a rating that is lower than ‘BBB-minus’ is non-investment grade).

What a credit rating is not

A credit rating does not reflect other types of risk, such as market or liquidity risks, which may also affect the value of a security. Nor does a credit rating consider the price at which an investor purchased a security, or the price at which the security may be sold. You should not interpret a credit rating as investment advice and should not view it as a recommendation to buy, sell, or hold securities. A credit rating is not a guarantee that a financial obligation will be repaid. For example, an ‘AAA’ credit rating on a debt instrument does not mean the investor will always be paid with absolute certainty—instruments rated at this level sometimes default.

Determinants of Bond Safety

Bond rating agencies base their quality ratings largely on an analysis of the level and trend of some of the issuer’s financial ratios. The key ratios used to evaluate safety are:

- ☞ **Coverage ratios.** Ratios of company earnings to fixed costs. For example, the *times interest-earned ratio* is the ratio of earnings before interest payments and taxes to interest obligations. The *fixed-charge coverage ratio* includes lease payments and

sinking fund payments with interest obligations to arrive at the ratio of earnings to all fixed cash obligations. Low or falling coverage ratios signal possible cash flow difficulties.

- ☞ **Leverage ratio.** Debt-to-equity ratio. A too-high leverage ratio indicates excessive indebtedness, signaling the possibility the firm will be unable to earn enough to satisfy the obligations on its bonds.
- ☞ **Liquidity ratios.** The two common liquidity ratios are the *current ratio* (current assets/current liabilities) and the *quick ratio* (current assets excluding inventories/current liabilities). These ratios measure the firm's ability to pay bills coming due with its most liquid assets.
- ☞ **Profitability ratios.** Measures of rates of return on assets or equity. Profitability ratios are indicators of a firm's overall performance. The *return on assets* (earnings before interest and taxes divided by total assets) or return on equity (net income/equity) are the most popular of these measures. Firms with higher return on assets or equity should be better able to raise money in security markets because they offer prospects for better returns on the firm's investments.
- ☞ **Cash flow-to-debt ratio.** This is the ratio of total cash flow to outstanding debt.

Activity 3.3

1. *What are different types of risk in bond, discuss features of those risks?*
2. *What are the determinants of Bond Safety?*

3.7 Analysis of convertible bonds

Convertible bonds give bondholders an option to exchange each bond for a specified number of shares of common stock of the firm. The *conversion ratio* gives the number of

shares for which each bond may be exchanged. Suppose a convertible bond is issued at par value of Birr 1,000 and is convertible into 40 shares of a firm's stock. The current stock price is Birr 20 per share, so the option to convert is not profitable now. Should the stock price later rise to Birr 30, however, each bond may be converted profitably into Birr 1,200 worth of stock. The *market conversion value* is the current value of the shares for which the bonds may be exchanged. At the Birr 20 stock price, for example, the bond's conversion value is Birr 800. The *conversion premium* is the excess of the bond price over its conversion value. If the bond were selling currently for Birr 950, its premium would be Birr 150. Convertible bondholders benefit from price appreciation of the company's stock. Not surprisingly, this benefit comes at a price; convertible bonds offer lower coupon rates and stated or promised yields to maturity than nonconvertible bonds. At the same time, the actual return on the convertible bond may exceed the stated yield to maturity if the option to convert becomes profitable.

An example of a simple convertible bond

On Sep 2013, Primus Telecom issued the following convertible bond.

Size:	Birr 110 million
Term:	7 years
Redemption date:	15 Sep 2020
Nominal value:	Birr 1000
Interest coupon:	3.75%
Conversion price:	Birr 9.3234
Conversion ratio:	107.257
Market price at issue:	100

The bond has a nominal (or par) value of Birr 1000. The market price is always quoted as percentage of the nominal value, which means you have to pay Birr 1000 to buy this bond

at issue. Like a straight bond, it pays you coupon semi-annually, so each coupon payment will be $1000 \times 3.75\% / 2 = \text{Birr } 18.75$. In addition, it allows you to exchange the bond for 107.2570 shares any time before maturity, which is 09/15/20. If the bond is not converted, it will be redeemed at par on maturity. Finally, the conversion price is equal to the nominal value divided by conversion rate.

Many of the convertible bonds are also callable by the issuer on a set of pre-specified dates, which may lead to “forced conversion”. Consider a callable convertible bond where the issuer has the option to call the bond at par tomorrow. However, the conversion value of the bond is Birr 110. In this case, the investor would be forced to convert the bond into shares worth Birr 110 before the call date. The call feature is an option with the issuer, and it will decrease the value of the convertible bond.

To make things more complicated, there are “protected” calls or “soft” calls where the bond can be called only if the share price (or the average share price over the past 20 days) is above a certain barrier.

Some convertible bonds may also have put features that allow the buyer to put back the bonds to the issuer. This is buyer’s option and it would increase the value of the convertible bond. If the call and put features occur simultaneously, priority is given according to the prospectus.

In the early 1990s, Japanese corporations began to issue CBs with “refix Clauses”. In its simplest form, it changes the conversion ratio subject to the share price level on certain days between issue and expiry. Suppose on one of these days the share price drops by 20%, then the refix clause may increase the conversion ratio by 20%. This feature makes it attractive to investor and will increase the value of the convertible bond.

There are complications on conversion proceeds. First, some bonds can be converted into a combination of shares and cash. In most cases, the conversion number as well as the cash amount varies as a function of time. Second, when a buyer converts and receives shares, these shares may either be distributed from existing stock or new shares just issued. In the latter case, there is a dilution effect the same company issues more shares. Third, shares

receive upon conversion may be denominated into a different currency. For example, the underlying shares of US dollar convertible bonds may be traded in Japanese yen. Buyers of this type of convertible bonds are also exposed to currency risk.

Summary

- ☞ A bond can be characterized based on (1) its intrinsic features, (2) its type, (3) its indenture provisions, or (4) the features that affect its cash flows and/or its maturity.
- ☞ The coupon, maturity, principal value, and the type of ownership are important intrinsic features of a bond.
- ☞ The **coupon** of a bond indicates the income that the bond investor will receive over the life (or holding period) of the issue. This is known as *interest income*, *coupon income*, or *nominal yield*.
- ☞ Sometimes, however, **zero-coupon bonds** are issued that make no coupon payments. In this case, investors receive par value at the maturity date, but receive no interest payments until then: The bond has a coupon rate of zero. These bonds are issued at prices considerably below par value, and the investor's return comes solely from the difference between issue price and the payment of par value at maturity.
- ☞ A bond is basically a loan issued by a corporation or government entity. The issuer pays the bondholder a specified amount of interest for a specified time, usually several years, and then repays the bondholder the face amount of the bond.
- ☞ Bonds can have different types of collateral and be senior, unsecured, or subordinated (junior) securities. **Secured (senior) bonds** are backed by a legal claim on some specified property of the issuer in the case of default. For example, mortgage bonds are secured by real estate assets; equipment trust certificates, which are used by railroads and airlines, provide a senior claim on the firm's equipment.
- ☞ Bond prices and yields are inversely related: As yields increase, bond prices fall; as yields fall, bond prices rise.
- ☞ An increase in a bond's yield to maturity results in a smaller price change than a decrease in yield of equal magnitude.

- ☞ Prices of long-term bonds tend to be more sensitive to interest rate changes than prices of short-term bonds.
- ☞ The sensitivity of bond prices to changes in yields increases at a decreasing rate as maturity increases. In other words, interest rate risk is less than proportional to bond maturity.
- ☞ Interest rate risk is inversely related to the bond's coupon rate. Prices of low-coupon bonds are more sensitive to changes in interest rates than prices of high-coupon bonds.
- ☞ The sensitivity of a bond's price to a change in its yield is inversely related to the yield to maturity at which the bond currently is selling.
- ☞ There are complications on conversion proceeds. First, some bonds can be converted into a combination of shares and cash. In most cases, the conversion number as well as the cash amount varies as a function of time
- ☞ Many of the convertible bonds are also callable by the issuer on a set of pre-specified dates, which may lead to "forced conversion".

SELF TEST EXERCISE

Part I: True or false

Say true if the statement is true and false if the statement is false.

1. Yield to maturity is the rate of return that an investor would earn if he bought a callable bond at its current market price and held it until the call date given that the bond was called on the call date.
2. Some convertible bonds may also have put features that allow the buyer to put back the bonds to the issuer.
3. Bond prices and yields are inversely related: As yields increase, bond prices fall; as yields fall, bond prices rise

4. Many of the convertible bonds are also callable by the issuer on a set of pre-specified dates, which may lead to “forced conversion”.
5. Convertible bonds give bondholders an option to exchange each bond for a specified number of shares of common stock of the firm.

Part II: Multiple choice

Choose the best answer from the given alternatives.

1. ----- is a grade given to bonds that indicates their credit quality.

A. Bond price	C. Bond risk
B. Bond Rating	D. Yield to maturity
2. -----is/are/ The key ratios used to evaluate bond safety .

A. Coverage ratios	D. Portfolio ratio
B. Leverage ratio	E. All Of the above
C. Liquidity ratio	
3. The effect of interest rate changes on bond prices will vary from bond to bond and will depend upon-----

A. Maturity of bond	D. A and C
B. Inflation rate of bond	E. None of the above
C. The coupon rate of bond	
4. ----- Occurs when the issuer default on the payment of the coupon, and even the principal amount

A. Credit risk	D. Inflation risk
B. Interest rate risk	E. Liquidity risk
C. Market risk	
5. ----- is calculated on the assumption that the bond will be held until maturity.

A. Yield to maturity	D. Inflation rate
B. Total value	E. All of the above
C. Interest rate	

Part III: Discussion questions

1. What is bond?
2. What does it mean callable bond?

Part IV: Workout questions

1. Raya Ltd has a 14 % bond with the face value of birr 100 that matures in 15 years. The bond is callable in five years at birr 114. It currently sells for Birr 105.

Required: Calculate: -

- i. Yield to call (YTC)
- ii. Yield to maturity (YTM)

CHAPTER FOUR

STOCK AND EQUITY VALUATION

Chapter objectives

After studying this chapter, you should be able to:

- Discuss the characteristics of stock
- Identify the balance sheet valuation methods
- Calculate the intrinsic value of the stock using the dividend discount model
- Discuss free cash flow models applications
- Describe earning multiplier approach to compare a company's current share price to its per-share earnings.

4.1 Introduction

Firms obtain their long-term sources of equity financing by issuing common and preferred stock. The payments of the firm to the holders of these securities are in the form of dividends. Unlike interest payments on debt which are tax deductible, dividends must be paid out of after-tax income either in the form of cash dividend or stock dividend. In addition to the above, contrary to payments to bondholders, payments to common stockholders are uncertain in both magnitude and timing. The common stockholders are the owners of the firm. It represents *equity* in a corporation. They have the right to vote on important matters to the firm such as the election of the Board of Directors. They have a residual claim against the assets and cash flows of the firm. That is, the common stockholders have a claim against whatever assets remain after the debt holders and preferred stockholders have been paid. Moreover, the cash flow that remains after interest and preferred dividends have been paid belongs to the common stockholders.

The priority of the claims against the assets of the firm belonging to debt holders, preferred stockholders, and common stockholders differ. The owners of the firm's debt securities have the first claim against the assets of the firm. This means that the debt holders must

receive their scheduled interest and principal payments before any dividends can be paid to the equity holders. If these claims are not paid, the debt holders can force the firm into bankruptcy. The preferred stockholders have the next claim. They must be paid the full amount of their scheduled dividends before any dividends may be distributed to the common stockholders.

4.2 Characteristics of Stock

The number of shares of stock that a corporation is *authorized* to issue is stated in its charter. The term *issued* refers to the shares issued to the stockholders. A corporation may re-acquire some of the stock that it has issued. The stock remaining in the hands of stockholders is then called **outstanding stock**. Upon request, corporations may issue stock certificates to stockholders to document their ownership. Printed on a stock certificate is the name of the company, the name of the stockholder, and the number of shares owned. The stock certificate may also indicate a dollar amount assigned to each share of stock, called **par value**. Stock may be issued without par, in which case it is called *no-par stock*.

Corporations have limited liability and, thus, creditors have no claim against stockholders' personal assets. To protect creditors, however, some states require corporations to maintain a minimum amount of paid-in capital. This minimum amount, called *legal capital*, usually includes the par or stated value of the shares issued.

The most important characteristics of common stock as an investment are its residual claim and its limited liability features.

Residual claim means stockholders are the last in line of all those who have a claim on the assets and income of the corporation. In a liquidation of the firm's assets, the shareholders have claim to what is left after paying all other claimants, such as the tax authorities, employees, suppliers, bondholders, and other creditors. In a going concern, shareholders have claim to the part of operating income left after interest and income taxes have been paid. Management either can pay this residual as cash dividends to shareholders or reinvest it in the business to increase the value of the shares.

Limited liability means that the most shareholders can lose in event of the failure of the corporation is their original investment. Shareholders are not like owners of unincorporated businesses, whose creditors can lay claim to the personal assets of the owner—such as houses, cars, and furniture. In the event of the firm's bankruptcy, corporate stockholders at worst have worthless stock. They are not personally liable for the firm's obligations: Their liability is limited.

The major rights that accompany ownership of a share of stock are as follows:

- ✎ The right to vote in matters concerning the corporation.
- ✎ The right to share in distributions of earnings.
- ✎ The right to share in assets on liquidation.

These stock rights normally vary with the class of stock.

4.3 Balance sheet methods/ techniques

Balance sheet methods are the methods which utilize the balance sheet information to value a company. These techniques consider everything for which accounting in the books of accounts is done.

Book Value: In this method, book value as per balance sheet is considered the value of equity. Book value means the net worth of the company. Net worth is calculated as follows:

Net Worth = Equity Share capital + Preference Share Capital + Reserves & Surplus – Miscellaneous Expenditure (as per B/Sheet) – Accumulated Losses.

The book value of a firm is the result of applying accounting rules that spread the acquisition cost of assets over a specified number of years, whereas the market price of a stock takes account of the firm's value as a going concern. In other words, the market price reflects the present value of its expected future cash flows. It would be unusual if the market price of a stock were exactly equal to its book value.

Liquidation Value: In this method, liquidation value is considered the value of equity. Liquidation value is the value realized if the firm is liquidated today. A better measure of a floor for the stock price is the firm's liquidation value per share.

This represents the amount of money that could be realized by breaking up the firm, selling its assets, repaying its debt, and distributing the remainder to the shareholders. The reasoning behind this concept is that if the market price of equity drops below the liquidation value of the firm, the firm becomes attractive as a takeover target. A corporate raider would find it profitable to buy enough shares to gain control and then actually liquidate because the liquidation value exceeds the value of the business as a going concern.

Liquidation Value = Net Realizable Value of All Assets – Amounts paid to All Creditors including Preference Shareholders.

Replacement Cost: Here, the value of equity is the replacement value. It means the cost that would be incurred to create a duplicate firm is the value of the firm. This concept assumes that interest in valuing a firm is the replacement cost of its assets less its liabilities. Some analysts believe the market value of the firm cannot get too far above its replacement cost for long because, if it did, competitors would try to replicate the firm. The competitive pressure of other similar firms entering the same industry would drive down the market value of all firms until they came into equality with replacement cost. It is assumed that the market value and replacement value will coincide in the long run. This idea is popular among economists, and the ratio of market price to replacement cost is known as **Tobin's q** , after the Nobel Prize-winning economist James Tobin. In the long run, according to this view, the ratio of market price to replacement cost will tend toward 1, but the evidence is that this ratio can differ significantly from 1 for very long periods of time.

Equity Value = Replacement Cost of Assets – Liabilities.

If the role of management is to increase the shareholder value, then managers can make better decisions if they can predict the impact of those decisions on the firm's value. By observing the difference in the firm's equity value at different points in time, one can better evaluate the effectiveness of financial decisions. A rudimentary way of valuing the equity

of a company is simply to take its balance sheet and subtract liabilities from assets to arrive at the equity value. However, this book value has little resemblance to the real value of the company. First, the assets are recorded at historical costs, which may be much greater than or much less their present market values. Second, assets such as patents, trademarks, loyal customers, and talented managers do not appear on the balance sheet but may have a significant impact on the firm's ability to generate future profits. So while the balance sheet method is simple, it is not accurate; there are better ways of accomplishing the task of valuation.

Intrinsic value versus market price

The most popular model for assessing the value of a firm as a going concern starts from the observation that the return on a stock investment comprises cash dividends and capital gains or losses. We begin by assuming a one-year holding period and supposing that ABC stock has an expected dividend per share, $E(D_1)$, of Birr 4; that the current price of a share, P_0 , is Birr 48; and that the expected price at the end of a year, $E(P_1)$, is Birr 52. For now, don't worry about how you derive your forecast of next year's price. At this point we ask only whether the stock seems attractively priced today given your forecast of next year's price. The expected holding-period return is $E(D_1)$ plus the expected price appreciation, $E(P_1) - P_0$, all divided by the current price P_0 .

$$\text{Expected HPR} = E(r) = \frac{E(D_1) + [E(P_1) - P_0]}{P_0}$$

$$\frac{4 + [52 - 48]}{48}$$

$$= 0.167 = 16.7\%$$

Note that $E()$ denotes an expected future value. Thus, $E(P_1)$ represents the expectation today of the stock price one year from now. $E(r)$ is referred to as the stock's expected holding period return. It is the sum of the expected dividend yield, $E(D_1)/P_0$, and the expected rate of price appreciation, the capital gains yield, $[E(P_1) - P_0]/P_0$.

But what is the required rate of return for ABC stock? We know from the capital asset pricing model (CAPM) that when stock market prices are at equilibrium levels, the rate of return that investors can expect to earn on a security is $r_f + [E(r_M) - r_f]$. Thus, the CAPM may be viewed as providing the rate of return an investor can expect to earn on a security given its risk as measured by beta. This is the return that investors will require of any other investment with equivalent risk. We will denote this required rate of return as k . If a stock is priced “correctly,” it will offer investors a “fair” return, i.e., its expected return will equal its required return. Of course, the goal of a security analyst is to find stocks that are mispriced.

For example, an underpriced stock will provide an expected return greater than the required return.

Suppose that $r_f = 6\%$, $E(r_M) - r_f = 5\%$, and the beta of ABC is 1.2. Then the value of k is

$$k = 6\% + 1.2 * 5\% = 12\%$$

The rate of return the investor expects exceeds the required rate based on ABC’s risk by a margin of 4.7%. Naturally, the investor will want to include more of ABC stock in the portfolio than a passive strategy would dictate. Another way to see this is to compare the intrinsic value of a share of stock to its market price. The **intrinsic value**, denoted V_0 , of a share of stock is defined as the present value of all cash payments to the investor in the stock, including dividends as well as the proceeds from the ultimate sale of the stock, discounted at the appropriate risk-adjusted interest rate, k .

Whenever the intrinsic value, or the investor’s own estimate of what the stock is really worth, exceeds the market price, the stock is considered undervalued and a good investment. In the case of ABC, using a one-year investment horizon and a forecast that the stock can be sold at the end of the year at price $P_1 = \text{Birr } 52$, the intrinsic value is

$$V = \frac{E(D_1) + E(P_1)}{1 + k} = \frac{4 + 52}{1.12} = \text{Birr } 50$$

Equivalently, at a price of Birr 50, the investor would derive a 12% rate of return just equal to the required rate of return on an investment in the stock. However, at the current price of Birr 48, the stock is underpriced compared to intrinsic value. At this price, it provides better than a fair rate of return relative to its risk. In other words, using the terminology of the CAPM, it is a positive-alpha stock, and investors will want to buy more of it than they would follow a passive strategy.

In contrast, if the intrinsic value turns out to be lower than the current market price, investors should buy less of it than under the passive strategy.

In market equilibrium, the current market price will reflect the intrinsic value estimates of all market participants. This means the individual investor whose V_0 estimate differs from the market price, P_0 , in effect must disagree with some or all of the market consensus estimates of $E(D_1)$, $E(P_1)$, or k . A common term for the market consensus value of the required rate of return, k , is the market capitalization rate.

Activity 4.1

- 1. What are the characteristics of stock?**
- 2. What is the difference between intrinsic value and market price?**

4.4 Dividend discount model

An asset's value is determined by the present value of its future cash flows. A stock provides two kinds of cash flows. First, most stocks pay dividends on a regular basis. Second, the stockholder receives the sale price when they sell the stock. In valuing the common stock, we have made two assumptions:

- We know the dividends that will be paid in the future.
- We know how much you will be able to sell the stock for in the future.

Both of these assumptions are unrealistic, especially knowledge of the future selling price. Furthermore, suppose that you intend on holding on to the stock for twenty years, the calculations would be very tedious! We cannot value common stock without making some simplifying assumptions. These assumptions will define the path of the future cash flows so that we can derive a present value formula to value the cash flows.

If we make the following assumptions, we can derive a simple model for common stock valuation:

- ↳ Your holding period is infinite (i.e., you will never sell the stock so you don't have to worry about forecasting a future selling price).
- ↳ The dividends will grow at a constant rate forever.

Note that the second assumption allows us to predict every future dividend, as long as we know the most recent dividend and the growth rate. Thus, in order to value common stocks, we need to answer an interesting question: Is the value of a stock equal to

- ↳ The discounted present value of the sum of next period's dividend plus next period's stock price, or
- ↳ The discounted present value of all future dividends?

To see that (1) and (2) are the same, let's start with an individual who will buy the stock and hold it for one year.

How do we value a share of common stock? Suppose you consider purchasing a share of stock today, and sell it a year from today. Let P_1 be the price that you expect you can sell the share at a year from today. Then, the value of the share of the stock today (P_0) is given by

$$P_0 = \frac{Div_1}{1+r} + \frac{P_1}{1+r} \quad (1)$$

Then, how P_1 should be determined? There must be a buyer who is willing to pay P_1 at date 1. If the buyer intends to keep the stock only one year and sell at the end of the year (like you do), P_1 should be determined by

$$P_1 = \frac{Div_2}{1+r} + \frac{P_2}{1+r} \quad (2)$$

$$P_n = \frac{\overline{Div_{n+1}}}{1+r} + \frac{P_{n+1}}{1+r}$$

Now, plug (2) into (1) then you will have the following relationship between the value of the share of stock and dividend. If you plug (2) into (1), you will have

$$P_0 = \frac{Div_1}{1+r} + \frac{Div_2}{(1+r)^2} + \frac{P_2}{(1+r)^2}$$

Note that P_2 is again determined by similar way. Therefore, it can be seen that, if we repeat this process, we will have

$$P_0 = \frac{Div_1}{1+r} + \frac{Div_2}{(1+r)^2} + \frac{Div_3}{(1+r)^3} + \frac{Div_4}{(1+r)^4} + \dots$$

$$P_o = \sum_{t=1}^{\infty} \frac{Div_t}{(1+r)^t}$$

Therefore, the value of a share of common stock is the present value of all the dividend payments. That is, the value of a firm's common stock to the investor is equal to the present value of all the expected future value.

Example4.4: Assume that you are considering the purchase of a stock which will pay dividends of Birr 2 (D_1) next year, and Birr 2.16 (D_2) the following year. After receiving the second dividend, you plan on selling the stock for Birr 33.33. What is the intrinsic value of this stock if your required return is 15%?

Solution:
$$P_o = \frac{2.00}{(1+.15)^1} + \frac{2.16+33.33}{(1+.15)^2} = 28.57$$

The above discussion shows that the value of a firm's common stock to the investor is equal to the present value of all the expected future value. In the following, we consider the valuation of common stock for three simple cases: (1) Zero growth, (2) Constant growth and (3) No constant growth rate.

Case 1: Valuation of common stock - Zero Growth

Assume that dividends will remain at the same level forever. It assumes that the dividend does not grow at all; therefore, this is an extreme case.

$$\text{Div}_1 = \text{Div}_2 = \text{Div}_3 = \dots = \text{Div}$$

Since future cash flows are constant, the value of a zero-growth stock is the present value of perpetuity:

$$P_0 = \frac{\text{Div}_1}{(1+r)^1} + \frac{\text{Div}_2}{(1+r)^2} + \frac{\text{Div}_3}{(1+r)^3} + \dots$$

$$P_0 = \frac{\text{Div}}{r}$$

Example 4.5: Suppose Amsalu purchase stock which will pay dividend of Birr 4 for next four year and sell to Birr 40 after collecting fourth year dividend. The stock required rate of return is 10%.

- Compute intrinsic value of the stock
- Assume he hold the stock for infinite period and compute intrinsic value of the stock

Solution

- Intrinsic value = $\frac{4}{(1+0.1)^1} + \frac{4}{(1+0.1)^2} + \frac{4}{(1+0.1)^3} + \frac{4}{(1+0.1)^4} + \frac{40}{(1+0.1)^4} = 40.007$
- Intrinsic value = $\frac{4}{0.1} = 40$

Case 2: Valuation of common stock - Constant Growth

A constant growth stock is a stock whose dividends are expected to grow at a constant rate in the foreseeable future. This condition fits many established firms, which tend to grow

over the long run at the same rate as the economy, fairly well. To come up with the formula for this case, let's assume that dividends will grow at a constant rate, g , forever. *i.e.*

$$\text{Div}_1 = \text{Div}$$

$$\text{Div}_2 = \text{Div}_1(1+g) = \text{Div}(1+g)$$

$$\text{Div}_3 = \text{Div}_2(1+g) = \text{Div}(1+g)^2$$

Example 4.6: Assume that Hampshire Products will pay a dividend of Birr 4 per share a year from now. Financial analysts believe that dividends will rise at 6 percent per year for the foreseeable future. What is the dividend per share at the end of each of the first five years?

End of year:	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>
Dividend:	Birr 4	Birr 4 X (1.06)	Birr 4 X (1.06) ²	Birr 4 X (1.06) ³	Birr 4 X (1.06) ⁴
	=Birr 4.24	=Birr 4.4944	=Birr 4.7641	=Birr 5.0499	

Therefore, the value of the commons stock for Case 2 is given by the growing perpetuity formula

$$P_0 = \frac{\text{Div}}{(1+r)^1} + \frac{\text{Div}(1+g)}{(1+r)^2} + \frac{\text{Div}(1+g)^2}{(1+r)^3} \dots$$

$$P_0 = \frac{\text{Div}_0(1+g)}{(r-g)} = \frac{\text{Div}_1(1+g)^2}{(1+r)^3}$$

Where:

P_0 = the stock price at time 0,

Div_0 = the current dividend,

Div_1 = the next dividend (*i.e.*, at time 1),

g = the growth rate in dividends, and

r = the required return on the stock, and

$g < r$.

Example 4.7: Find the stock price given that the current dividend is Birr 2 per share, dividends are expected to grow at a rate of 6% in the foreseeable future, and the required return is 12%.

$$P_0 = \frac{2(1+0.06)}{0.12-0.06} = \text{Birr } 35.33$$

Dividend Yield and Capital Gains Yield

The constant growth stock equation can be rearranged to obtain an expression for the expected return on the stock as follows:

$$r = \frac{D_1}{P_0} + g$$

When expressed in this manner, it is apparent that the expected return on the stock equals the expected **dividend yield** plus the expected **capital gains yield** where the dividend yield and capital gains yield are defined as follows:

$$\text{Dividend Yield} = \frac{D_1}{P_0}; \text{ Capital Gains Yield} = g$$

A more general form of the Constant Growth Stock Valuation formula which can be used to find the price of the stock at any period t in the future is given by the following:

$$P_t = \frac{D_t(1+g)}{r-g} = \frac{D_{t+1}}{r-g}$$

Exercise: Suppose an investor is considering the purchase of a share of the Utah Mining Company. The stock will pay a Birr 3 dividend a year from today. This dividend is expected

to grow at 10 percent per year for the foreseeable future ($g=0.1$). The stock holder thinks that required return on this stock is 15 percent ($r=0.15$). What is the value of a share of Utah Mining Company's stock?

$$P = \frac{3(1+0.1)}{0.15-0.1} = 66$$

Case 3: Non-constant Growth Stock Valuation

Many firms enjoy periods of rapid growth. These periods may result from the introduction of a new product, a new technology, or an innovative marketing strategy. However, the period of rapid growth cannot continue indefinitely. Eventually, competitors will enter the market and catch up with the firm.

These firms cannot be valued properly using the Constant Growth Stock Valuation approach. This section presents a more general approach which allows for the dividends/growth rates during the period of rapid growth to be forecast. Then, it assumes that dividends will grow from that point on at a constant rate which reflects the long-term growth rate in the economy.

Stocks which are experiencing the above pattern of growth are called non-constant, supernormal, or erratic growth stocks.

The value of a non-constant growth stock can be determined using the following equation:

$$P_0 = \sum_{t=1}^T \frac{D_t}{(1+r)^t} + \left(\frac{D_{T+1}}{r - g_c} \right) (1+r)^{-T}$$

Where:

P_0 = the stock price at time 0,

D_t = the expected dividend at time t ,

T = the number of years of non-constant growth,

g_c = the long-term constant growth rate in dividends, and

r = the required return on the stock, and

$g_c < r$.

Example 4.8: The current dividend on a stock is Birr 2 per share and investors require a rate of return of 12%. Dividends are expected to grow at a rate of 20% per year over the next three years and then at a rate of 5% per year from that point on. Find the price of the stock.

Solution:

There are 3 years of non-constant growth, thus, $T = 3$. Before substituting into the formula given above it is necessary to calculate the expected dividends for years 1 through 4 using the provided growth rates.

$$D_1 = 2(1+0.20) = \text{Birr } 2.40$$

$$D_2 = 2.40 (1+0.20) = \text{Birr } 2.88$$

$$D_3 = 2.88 (1+0.20) = \text{Birr } 3.456$$

$$D_4 = 3.456(1+0.05) = \text{Birr } 3.6288$$

$$P = \frac{2.40}{(1+0.12)^1} + \frac{2.88}{(1+0.12)^2} + \frac{3.456}{(1+0.12)^3} + \frac{3.6288}{(0.12-0.05)}(1+0.12)^{-3} = \text{Birr } 43.80$$

Activity 4.2

- 1. Suppose Doysa purchase stock which will pay divided of Birr 6 for next five year and sell to Birr 100 after collecting fourth year dividend. The stock required rate of return is 12%. What is the intrinsic value of the stock?**
- 2. The current dividend on a stock is Birr 20 per share and investors require a rate of return of 18%. Dividends are expected to grow at a rate of 10% per year over the next two years and then at a rate of 15% per year from that point on. Find the price of the stock.**

4.5 Preferred Stock and their Valuation

Preferred Stock Valuation

Preferred stock is defined as equity with priority over common stock with respect to the payment of dividends and the distribution of assets in liquidation. Preferred stock is a hybrid security which shares features with both common stock and debt.

Preferred stock is similar to common stock in that it entitles its owners to receive dividends which the firm must pay out of after-tax income. Moreover, the use of preferred stock as a source of financing does not increase the probability of bankruptcy for the firm.

However, like the coupon payments on debt, the dividends on preferred stock are generally fixed. Also, the claims of the preferred stockholders against the assets of the firm are fixed as the claims of the debt holders. Preferred stock has the following contents:

Par Value

The par value represents the claim of the preferred stockholder against the value of the firm.

Preferred Dividend / Preferred Dividend Rate

The preferred dividend rate is expressed as a percentage of the par value of the preferred stock. The annual preferred dividend is determined by multiplying the preferred dividend rate times the par value of the preferred stock.

Since the preferred dividends are generally fixed, preferred stock can be valued as a constant growth stock with a dividend growth rate equal to zero. Thus, the price of a share of preferred stock can be determined using the following equation:

$$P_p = \frac{D_p}{r}$$

Where:

P_p = the preferred stock price,

D_p = the preferred dividend, and

r = the required return on the stock.

Example 4.9: Find the price of a share of preferred stock given that the par value is Birr 100 per share, the preferred dividend rate is 8%, and the required return is 10%.

Solution:

$$P_p = \frac{.08 * 100}{.10} = \frac{8}{.10} = \$80$$

Stock Prices and Investment Opportunities

Consider two companies, Cash Cow, Inc., and Growth Prospects, each with expected earnings in the coming year of Birr 5 per share. Both companies could in principle pay out all of these earnings as dividends, maintaining a perpetual dividend flow of Birr 5 per share. If the market capitalization rate were $k = 12.5\%$, both companies would then be valued at $D1/k = \text{Birr } 5/.125 = \text{Birr } 40$ per share. Neither firm would grow in value, because with all earnings paid out as dividends, and no earnings reinvested in the firm, both companies' capital stock and earnings capacity would remain unchanged over time; earnings and dividends would not grow.

Now suppose one of the firms, Growth Prospects, engages in projects that generate a return on investment of 15%, which is greater than the required rate of return, $k = 12.5\%$. It would be foolish for such a company to pay out all of its earnings as dividends. If Growth Prospects retains or plows back some of its earnings into its highly profitable projects, it can earn a 15% rate of return for its shareholders, whereas if it pays out all earnings as dividends, it forgoes the projects, leaving shareholders to invest the dividends in other opportunities at a fair market rate of only 12.5%. Suppose, therefore, Growth Prospects chooses a lower **dividend payout ratio** (the fraction of earnings paid out as dividends), reducing payout from 100% to 40%, and maintaining a **plowback ratio** (the fraction of earnings reinvested in the firm) of 60%. The plowback ratio also is referred to as the **earnings retention ratio**.

The dividend of the company, therefore, will be Birr 2 (40% of \$5 earnings) instead of Birr 5. Will the share price fall? No, it will rise! Although dividends initially fall under the earnings reinvestment policy, subsequent growth in the assets of the firm because of reinvested profits will generate growth in future dividends, which will be reflected in today's share price. The dividend streams which should be generated by Growth Prospects under two dividend policies. A low reinvestment rate plan allows the firm to pay higher initial dividends but results in a lower dividend growth rate. Eventually, a high reinvestment rate plan will provide higher dividends. If the dividend growth generated by

the reinvested earnings is high enough, the stock will be worth more under the high reinvestment strategy.

How much growth will be generated? Suppose Growth Prospects starts with plant and equipment of Birr 100 million and is all-equity-financed. With a return on investment or equity (ROE) of 15%, total earnings are $\text{ROE} \times \text{Birr } 100 \text{ million} = 0.15 \times \text{Birr } 100 \text{ million} = \text{Birr } 15 \text{ million}$. There are 3 million shares of stock outstanding, so earnings per share are Birr 5, as posited above. If 60% of the Birr 15 million in this year's earnings is reinvested, then the value of the firm's capital stock will increase by $0.60 \times \text{Birr } 15 \text{ million} = \text{Birr } 9 \text{ million}$, or by 9%. The percentage increase in the capital stock is the rate at which income was generated (ROE) times the plowback ratio (the fraction of earnings reinvested in more capital), which we will denote as b .

Now endowed with 9% more capital, the company earns 9% more income and pays out 9% higher dividends. The growth rate of the dividends, therefore, is

$$g = \text{ROE} \times b = 15\% \times 0.60 = 9\%$$

If the stock price equals its intrinsic value, and this growth rate can be sustained (i.e., if the ROE and payout ratios are consistent with the long-run capabilities of the firm), then the stock should sell at

$$P_0 = \frac{D_1}{k-g} = \frac{2}{0.125-0.09} = 57.14$$

When Growth Prospects pursued a no-growth policy and paid out all earnings as dividends, the stock price was only Birr 40. Therefore, you can think of \$40 as the value per share of the assets the company already has in place.

When Growth Prospects decided to reduce current dividends and reinvest some of its earnings in new investments, its stock price increased. The increase in the stock price reflects the fact that planned investments provide an expected rate of return greater than the required rate. In other words, the investment opportunities have positive net present

value. The value of the firm rises by the NPV of these investment opportunities. This net present value is also called the **present value of growth opportunities**, or **PVGO**.

Therefore, we can think of the value of the firm as the sum of the value of assets already in place, or the no-growth value of the firm, plus the net present value of the future investments the firm will make, which is the PVGO. For Growth Prospects, $PVGO = \text{Birr } 17.14$ per share:

Price = No-growth value per share + PVGO

$$P_0 = E_1/k + PVGO = 57.14 = 40 + 17.14$$

It is important to recognize that growth per share is not what investor's desire. Growth enhances company value only if it is achieved by investment in projects with attractive profit opportunities (i.e., with $ROE > k$). To see why, let's now consider Growth Prospects' unfortunate sister company, Cash Cow. Cash Cow's ROE is only 12.5%, just equal to the required rate of return, k . Therefore, the NPV of its investment opportunities is zero. We've seen that following a zero-growth strategy with $b = 0$ and $g = 0$, the value of Cash Cow will be $E_1/k = \text{Birr } 5/.125 = \text{Birr } 40$ per share. Now suppose Cash Cow chooses a plowback ratio of $b = 0.60$, the same as Growth Prospects' plowback. Then g would be

$$g = ROE \times b = .125 \times .60 = .075$$

But the stock price is still;

$$P_0 = \frac{D_1}{k-g} = \frac{2}{0.125-0.075} = \$40$$

No different from the no-growth strategy.

In the case of Cash Cow, the dividend reduction that frees funds for reinvestment in the firm generates only enough growth to maintain the stock price at the current level. This is as it should be: If the firm's projects yield only what investors can earn on their own, then NPV is zero, and shareholders cannot be made better off by a high reinvestment rate policy. This demonstrates that "growth" is not the same as growth opportunities. To justify

reinvestment, the firm must engage in projects with better prospective returns than those shareholders can find elsewhere. Notice also that the PVGO of Cash Cow is zero: $PVGO = P_0 - E_1/k = 40 - 40 = 0$. With $ROE = k$, there is no advantage to plowing funds back into the firm; this shows up as PVGO of zero. In fact, this is why firms with considerable cash flow, but limited investment prospects, are called “cash cows.” The cash these firms generate is best taken out of or “milked from” the firm.

Takeover Target is run by entrenched management that insists on reinvesting 60% of its earnings in projects that provide a ROE of 10%, despite the fact that the firm’s capitalization rate is $k = 15\%$. The firm’s year-end dividend will be Birr 2 per share, paid out of earnings of Birr 5 per share. At what price will the stock sell? What is the present value of growth opportunities? Why would such a firm be a takeover target for another firm?

Given current management’s investment policy, the dividend growth rate will be

$$g = ROE \times b = 10\% \times .6 = 6\%$$

And the stock price should be

$$P_0 = \text{Birr } 2 / 0.15 - 0.06 = \text{Birr } 22.22$$

The present value of growth opportunities is

$$PVGO = \text{Price per share} - \text{No-growth value per share}$$

$$= \text{Birr } 22.22 - E_1 / k = \text{Birr } 22.22 - \text{Birr } 5 / .15 = -\text{Birr } 11.11$$

PVGO is *negative*. This is because the net present value of the firm’s projects is negative: The rate of return on those assets is less than the opportunity cost of capital. Such a firm would be subject to takeover, because another firm could buy the firm for the market price of Birr 22.22 per share and increase the value of the firm by changing its investment policy. For example, if the new management simply paid out all earnings as dividends, the value of the firm would increase to its no-growth value, $E_1/k = \text{Birr } 5 / .15 = \text{Birr } 33.33$.

4.6 Free cash flow model

The dividend discount model is based upon the premise that the only cash flows received by stockholders are dividends. Even if we use the modified version of the model and treat stock buybacks as dividends, we may mis-value firms that consistently return less or more than they can afford to their stockholders.

This section uses a more expansive definition of cash flows to equity as the cash flows left over after meeting all financial obligations, including debt payments, and after covering capital expenditure and working capital needs. It discusses the reasons for differences between dividends and free cash flows to equity, and presents the discounted free cash flow to equity model for valuation.

Measuring what firms can return to their stockholders

Given what firms are returning to their stockholders in the form of dividends or stock buybacks, how do we decide whether they are returning too much or too little? We measure how much cash is available to be paid out to stockholders after meeting reinvestment needs and compare this amount to the amount actually returned to stockholders.

Free Cash Flows to Equity

To estimate how much cash a firm can afford to return to its stockholders, we begin with the net income the accounting measure of the stockholders' earnings during the period and convert it to a cash flow by subtracting out a firm's reinvestment needs.

First, any capital expenditures, defined broadly to include acquisitions, are subtracted from the net income, since they represent cash outflows. Depreciation and amortization, on the other hand, are added back in because they are non-cash charges. The difference between capital expenditures and depreciation is referred to as net capital expenditures and is usually a function of the growth characteristics of the firm. High-growth firms tend to have high net capital expenditures relative to earnings, whereas low-growth firms may have low and sometimes even negative, net capital expenditures.

Second, increases in working capital drain a firm's cash flows, while decreases in working capital increase the cash flows available to equity investors. Firms that are growing fast, in industries with high working capital requirements (retailing, for instance) typically have large increases in working capital. Since we are interested in the cash flow effects, we consider only changes in non-cash working capital in this analysis.

Finally, equity investors also have to consider the effect of changes in the levels of debt on their cash flows. Repaying the principal on existing debt represents a cash outflow; but the debt repayment may be fully or partially financed by the issue of new debt, which is a cash inflow. Again, netting the repayment of old debt against the new debt issues provides a measure of the cash flow effects of changes in debt.

Allowing for the cash flow effects of net capital expenditures, changes in working capital and net changes in debt on equity investors, we can define the cash flows left over after these changes as the free cash flow to equity (FCFE).

Free Cash Flow to Equity (FCFE) = Net Income - (Capital Expenditures - Depreciation) - (Change in Non-cash Working Capital) + (New Debt Issued - Debt Repayments)

This is the cash flow available to be paid out as dividends or stock buybacks.

This calculation can be simplified if we assume that the net capital expenditures and working capital changes are financed using a fixed mix of debt and equity. If d is the proportion of the net capital expenditures and working capital changes that is raised from debt financing, the effect on cash flows to equity of these items can be represented as follows:

Equity Cash Flows associated with Capital Expenditure Needs = $-(\text{Capital Expenditures} - \text{Depreciation})(1 - d)$

Equity Cash Flows associated with Working Capital Needs = $-(\Delta \text{Working Capital})(1-d)$

Accordingly, the cash flow available for equity investors after meeting capital expenditure and working capital needs, assuming the book value of debt and equity mixture is constant, is:

$$\text{Free Cash Flow to Equity} = \text{Net Income} - (\text{Capital Expenditures} - \text{Depreciation})(1 - d) - (\Delta \text{Working Capital})(1 - d)$$

Note that the net debt payment item is eliminated, because debt repayments are financed with new debt issues to keep the debt ratio fixed. It is particularly useful to assume that a specified proportion of net capital expenditures and working capital needs will be financed with debt if the target or optimal debt ratio of the firm is used to forecast the free cash flow to equity that will be available in future periods. Alternatively, in examining past periods, we can use the firm's average debt ratio over the period to arrive at approximate free cash flows to equity.

What about preferred dividends?

In both the long and short formulations of free cash flows to equity described in the section above, we have assumed that there are no preferred dividends paid. Since the equity that we value is only common equity, you would need to modify the formulae slightly for the existence of preferred stock and dividends. In particular, you would subtract out the preferred dividends to arrive at the free cash flow to equity:

$$\text{Free Cash Flow to Equity (FCFE)} = \text{Net Income} - (\text{Capital Expenditures} - \text{Depreciation}) - (\text{Change in Non-cash Working Capital}) - (\text{Preferred Dividends} + \text{New Preferred Stock Issued}) + (\text{New Debt Issued} - \text{Debt Repayments})$$

In the short form, you would obtain the following:

$$\text{Free Cash Flow to Equity} = \text{Net Income} - \text{Preferred Dividend} - (\text{Capital Expenditures} - \text{Depreciation})(1 - d) - (\Delta \text{Working Capital})(1 - d)$$

The non-equity financial ratio (d) would then have to include the expected financing from new preferred stock issues.

This is the cash flow that accrues from the firm's operations, net of investments in capital and net working capital. It includes cash flows available to both debt and equity holders.

Alternatively, we can focus on cash flow available to equity holders. This will differ from free cash flow to the firm by after-tax interest expenditures, as well as by cash flow associated with net issuance or repurchase of debt (i.e., principal repayments minus proceeds from issuance of new debt).

$$FCFE = FCFF - \text{Interest expense} \times (1 - \text{corporate tax rate}) + \text{Increases in net debt}$$

The free cash flow to the firm approach discounts year-by-year cash flows plus some estimate of terminal value, P_T . In Equation below, we use the constant growth model to estimate terminal value. The appropriate discount rate is the weighted average cost of capital

$$\text{Firm value} = \sum_{t=1}^T \frac{FCFF_t}{(1 + WACC)^t} + \frac{P_T}{(1 + WACC)^T}$$

Where

$$P_T = \frac{FCFF_{T+1}}{WACC - g}$$

To find equity value, we subtract the existing market value of debt from the derived value of the firm.

Alternatively, we can discount free cash flows to *equity* (FCFE) at the cost of *equity*, k_E ,

$$\text{Market value of equity} = \sum_{t=1}^T \frac{FCFE_t}{(1 + k_E)^t} + \frac{P_T}{(1 + k_E)^T}$$

Where

$$P_T = \frac{FCFE_{T+1}}{k_E - g}$$

4.7 Earning multiplier approach

The **earnings multiplier**, also called the price-to-earnings ratio (P/E), is a valuation method used to compare a company's current share price to its per-share earnings. Many investors prefer to estimate the value of common stock using an earnings multiplier model. Basic Concept: The value of any investment is the present value of future returns. In the case of common stocks, the returns that investors are entitled to receive are the net earnings of the firm. Therefore, one way investors can estimate value is by determining how many dollars they are willing to pay for a dollar of expected earnings (typically represented by the estimated earnings during the following 12-month period).

Example: If investors are willing to pay 10 times expected earnings, they would value a stock they expect to earn Birr 2 a share during the following year at Birr 20.

computation of the current earnings multiplier

$$\text{Earnings multiplier} = \frac{\text{price}}{\text{earnings ratio}} = \frac{\text{current market price}}{\text{expected 12-month earnings}}$$

What does this indicate? It indicates the prevailing attitude of investors toward a stock's value. Investors must decide if they agree with the prevailing P/E ratio (that is, is the earnings multiplier too high or too low?) based upon how it compares to the P/E ratio for the aggregate market, for the firm's industry, and for similar firms and stocks. To answer this question, we must consider what influences the earnings multiplier (P/E ratio) over time. Example For any Industry Index, over time the aggregate stock market P/E ratio may vary from about 6 times earnings to about 30 times earnings. D_1

Factors affecting p/e ratio the infinite period dividend discount model can be used to indicate the variables that should determine the value of the P/E ratio as follows:

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

If we divide both sides of the equation by E_1 (expected earnings during the next 12 months),

$$\text{the result is: } \frac{P_i}{E_1} = \frac{D_1/E_1}{k-g}$$

Thus, the P/E ratio is determined by:

1. The expected dividend payout ratio (dividends divided by earnings)
2. The estimated required rate of return on the stock (k)
3. The expected growth rate of dividends for the stock (g)

Example (The spread between k and g is the main determinant of the size of the P/E ratio.) If we assume a stock has an expected dividend payout of 50 % a required rate of return of 12%, and an expected growth rate for dividends of 8 %, this would imply the following:
D/E = 0.50: k = 0.12: g = 0.08

$$: \frac{p_i}{E_1} = \frac{D_1/E_1}{k-g} \quad p/E = \frac{0.50}{0.12-0.08} = 0.50/0.04 = 12.5$$

A small difference in either k or g or both will have a large impact on the earnings multiplier....and What about Dividend Payout Ratio?

$$p/E = \frac{0.50}{0.13-0.08} = \underline{10}; \quad p/E = \frac{0.50}{0.12-0.09} = \underline{16.7}; \quad p/E = \frac{0.50}{0.11-0.08} = \underline{25}$$

How would you do your stock valuation?

After estimating the earnings multiple, you would apply it to your estimate of earnings for the next year (E1) to arrive at an estimated value.

E1 is based on the earnings for the current year (E0) and your expected growth rate of earnings. Using these two estimates, you would compute an estimated value of the stock and compare this estimated value to its market price. Consider the following estimates for an example firm:

$$D/E = 0.50 \quad g = 0.09$$

$$K = 0.12 \quad E_0 = \text{Birr } 2.00$$

Your Earnings Multiple:

$$= \frac{0.50}{0.12-0.09} = 0.50/0.03 = 16.7$$

✎ Given current earnings (E_0) of Birr 2.00 and a g of 9%, you would expect E_1 to be Birr 2.18.

✎ : Therefore, you would estimate the value (price) of the stock as: $V = 16.7 \times \text{Birr } 2.18 = \text{Birr } 36.41$

As before, you would compare this estimated value of the stock to its current market price to decide whether you should invest in it. This is a two-step process.

The value of the stock is obtained by multiplying projected earnings per share by a forecast of the P/E ratio. This procedure seems simple, but its apparent simplicity is deceptive. First, forecasting earnings is challenging. It is known that, the earnings will depend on international, macroeconomic, and industry as well as firm-specific factors, many of which are highly unpredictable. Second, forecasting the P/E multiple is even more difficult. P/E ratios vary across industries and over time. Nevertheless, our discussion of stock valuation provides some insight into the factors that ought to determine a firm's P/E ratio.

Growth opportunities, in which we compared two firms, Growth Prospects and Cash Cow, each of which had earnings per share of Birr 5 and growth Prospects reinvested 60% of its earnings in prospects with a ROE of 15%, while Cash Cow paid out all of its earnings as dividends. Cash Cow had a price of Birr 40, giving it a P/E multiple of $40/5 = 8.0$, while Growth Prospects sold for Birr 57.14, giving it a multiple of $57.14/5 = 11.4$. This observation suggests the P/E ratio might serve as a useful indicator of expectations of growth opportunities. We can see this explicitly by rearranging $P_0 = E_1/k + PVGO$

$$P_0/E_1 = \frac{1}{k} \left[1 + \frac{PVGO}{E_1/k} \right]$$

When $PVGO = 0$, the above Equation shows that $P_0 = E_1/k$. The stock is valued like a non-growing perpetuity of EPS. The P/E ratio is just $1/k$. However, as $PVGO$ becomes an increasingly dominant contributor to price, the P/E ratio can rise dramatically. The ratio of $PVGO$ to E/k has a simple interpretation. It is the ratio of the component of firm value reflecting growth opportunities to the component of value reflecting assets already in place (i.e., the no-growth value of the firm, E/k). When future growth opportunities dominate the

estimate of total value, the firm will command a high price relative to current earnings. Thus, a high P/E multiple appears to indicate that a firm is endowed with ample growth opportunities.

Return again to Takeover Target, the firm we first encountered in Example above. Earnings are Birr 5 per share, and the capitalization rate is 15%, implying that the no-growth value of the firm is $E1/k = \text{Birr } 5/.15 = \text{Birr } 33.33$. The stock price actually is Birr 22.22, implying that the present value of growth opportunities equals -Birr 11.11. This implies that the P/E ratio should be

$$P0/E1 = \frac{1}{k} \left[1 + \frac{PVGO}{E1/k} \right] = \frac{1}{.15} \left[1 + \frac{-11.11}{33.3} \right] = 4.44$$

In fact, the stock price is Birr 22.22 and earnings are Birr 5 per share, so the P/E ratio is Birr 22.22/Birr 5 = 4.44.

Other Comparative Valuation Ratios

The price–earnings ratio is an example of a comparative valuation ratio. Such ratios are used to assess the valuation of one firm versus another based on a fundamental indicator such as earnings. For example, an analyst might compare the P/E ratios of two firms in the same industry to test whether the market is valuing one firm “more aggressively” than the other. Other such comparative ratios are commonly used.

Price-to-book ratio

This is the ratio of price per share divided by book value per share. As we noted earlier in this chapter, some analysts view book as a useful measure of value and therefore treat the ratio of price-to-book value as an indicator of how aggressively the market values the firm.

Price-to-cash flow ratio

Earnings as reported on the income statement can be affected by the company’s choice of accounting practices and thus are commonly viewed as subject to some imprecision and even manipulation. In contrast, cash flow which tracks cash actually flowing into or out of

the firm is less affected by accounting decisions. As a result, some analysts prefer to use the ratio of price to cash flow per share rather than price to earnings per share. Some analysts use operating cash flow when calculating this ratio; others prefer free cash flow, that is, operating cash flow net of new investment.

Price-to-sales ratio

Many start-up firms have no earnings. As a result, the P/E ratio for these firms is meaningless. The price-to-sales ratio (the ratio of stock price to the annual sales per share) is sometimes taken as a valuation benchmark for these firms. Of course, price-to-sales ratios can vary markedly across industries, since profit margins vary widely.

Be creative

Sometimes a standard valuation ratio will simply not be available, and you will have to devise your own. In the 1990s, some analysts valued retail Internet firms based on the number of Web hits their sites received. In retrospect, they valued these firms using too generous “price-to-hits” ratios. Nevertheless, in a new investment environment, these analysts used the information available to them to devise the best valuation tools they could.

Activity 4.3

- 1. How preferred stock price calculation differ from common stock?**
- 2. What is earning multiplier?**

Summary

- ☞ The common stockholders are the owners of the firm. It represents *equity* in a corporation. They have the right to vote on important matters to the firm such as the election of the Board of Directors.

- ☞ The most important characteristics of common stock as an investment are its residual claim and its limited liability features.
- ☞ Balance sheet methods are the methods which utilize the balance sheet information to value a company. These techniques consider everything for which accounting in the books of accounts is done.
- ☞ The intrinsic value, denoted V_0 , of a share of stock is defined as the present value of all cash payments to the investor in the stock, including dividends as well as the proceeds from the ultimate sale of the stock, discounted at the appropriate risk-adjusted interest rate, k .
- ☞ An asset's value is determined by the present value of its future cash flows. A stock provides two kinds of cash flows. First, most stocks pay dividends on a regular basis. Second, the stockholder receives the sale price when they sell the stock. In valuing the common stock, we have made two assumptions:
 - ✓ We know the dividends that will be paid in the future.
 - ✓ We know how much you will be able to sell the stock for in the future.
- ☞ Unrealistic assumptions but based on this we can use different common stock valuation formula.
- ☞ Preferred stock is defined as equity with priority over common stock with respect to the payment of dividends and the distribution of assets in liquidation. Preferred stock is a hybrid security which shares features with both common stock and debt.
- ☞ Since the preferred dividends are generally fixed, preferred stock can be valued as a constant growth stock with a dividend growth rate equal to zero.
- ☞ The earnings multiplier, also called the price-to-earnings ratio (P/E), is a valuation method used to compare a company's current share price to its per-share earnings. Many investors prefer to estimate the value of common stock using an earnings multiplier model. Basic Concept: The value of any investment is the present value of future returns.

Self-test Exercise

Part II: True or false

Say true if the statement is correct or false if the statement is incorrect.

1. Par value is the stock certificate that indicate a dollar amount assigned to each share of stock.
2. The intrinsic value of a share of stock is defined as the present value of all cash payments to the investor in the stock.
3. Preferred stock is defined as equity with priority over common stock with respect to the payment of dividends and the distribution of assets in liquidation
4. The earnings multiplier is a valuation method used to compare a company's current share price to its per-share earnings.
5. Replacement cost valuation methods calculates the value of the firm as the cost that would be incurred to create a duplicate firm.

Part II: Multiple choice

Choose the best answer among the given alternatives

1. What are the major rights that accompany ownership of stocks?
 - A. The right to vote in matters concerning the corporation.
 - B. The right to share in distributions of earnings.
 - C. The right to share in assets on liquidation.
 - D. All of the above
2. Which of the following take the priority to claim on the asset during liquidation?
 - A. Bond holder
 - B. Preferred stock
 - C. Common stock
 - D. None of the above
3. The share issued and left on the hand of shareholder is:
 - A. Issued share
 - B. Outstanding share
 - C. Treasury share
 - D. Common share
4. What is possible similarity of the preferred stock and common stock?

- A. Fixed dividend
 - B. Voting right
 - C. Dividend paid after tax
 - D. None of the above
5. Which of the following is **not** used to determine price-to-earnings?
- A. The expected dividend payout ratio
 - B. The estimated required rate of return on the stock
 - C. The expected growth rate of dividends for the stock
 - D. None of the above

Part III: workout questions

1. High Flyer company has just paid its annual dividend of Birr 3 per share. The dividend is expected to grow at a constant rate of 8% indefinitely. The required rate is 14%. What is the intrinsic value of the stock?
2. Suppose dividends for a particular company are projected to grow at 5 percent forever. If the discount rate is 15 percent and the current dividend is Birr 10, what is the value of the stock?
3. Suppose that the stock pays three annual dividends of Birr 10, 20, and 30 in years 1, 2, and 3, respectively, and the discount rate is $k = 10$ percent and expected to sale at Birr 120. What is the price of the stock today?

CHAPTER FIVE

SECURITY ANALYSIS

Chapter objectives

After studying this chapter, you should be able to:

- Discuss the micro-economic analysis of security
- Identify the industry analysis of security
- Explain the company analysis of the security
- Discuss the procedures within the company analysis security
- Describe the technical analysis of security

5.1 Introduction

Any economic analysis requires the consideration of inflation. Inflation causes differences between real and nominal interest rates and changes the spending and savings behavior of consumers and corporations. The performance of a company depends much on the performance of the economy. If the economy is BOOM, the industries and companies in general said to be prosperous. On the other hand, if the economy is in RECESSION, the performance of companies will be generally poor.

Investors are interested in studying those economic varieties, which affect the performance of the company in which they proposed to invest. An analyzed of those economic variables would give an idea about future corporate earnings and the payment of dividends and interest to investors. Fundamental analysis is performed on historical and present data, but with the goal of making financial [forecasts](#).

Technical analysis can be defined as the use of specific market-generated data for the analysis of both aggregate stock prices (market indices or industry averages) and individual stocks. The field of technical analysis is based on three assumptions these are the market discounts everything, Price moves in trends and History tends to repeat itself.

Industry analysis is a market strategy tool used by businesses to determine if they want to enter a product or service market. Company management must carefully analyze several aspects of the industry to determine if they can make a profit selling goods and services in the market. After determining that an industry's outlook is good, an investor can analyze and compare individual firms' performance within the entire industry using financial ratios and cash flow values. Many financial ratios for firms are valid only when they are compared to the performance of their industries. GDP indicates the rate of growth of the economy. It represents the aggregate value of goods and services produced in the economy. The growth rate of economy points out the prospects for the industrial sector and the return investors can expect from investment in shares. The higher growth rate is more favorable to the stock market.

Savings and investments represent that portion of GNP which is saved and invested. It is obvious that growth requires investment which in turn requires substantial amount to domestic savings. Stock market is a channel through which the savings of the investors are made available to the corporate bodies. A higher level of savings and investments accelerates the pace of growth of the stock market.

5.2 Fundamental analysis (Economic Industry Company Analysis)

In order to make a rational and scientific investment decision, an investor has to evaluate a lot of information about, the past performance and the expected future performance of companies, industries and the economy as a whole before taking the investment decision. Such evaluation or analysis is called **fundamental analysis**.

It is based on the basic premise that security price is determined by a number of fundamental factors relating to the economy, industry and company. Hence, the economy fundamentals, industry fundamentals and company fundamentals have to be considered while analyzing a security for investment purpose.

The investor can then compare the intrinsic value with market price to arrive at investment decision. *If the market price of a security is lower than its intrinsic value, the investor would decide to buy a security as it is underpriced.* The price of such a security is expected to move up in the future to match with its intrinsic value.

On the contrary, when the market price of a security higher than its intrinsic value, its perceived to be overpriced. The market price of such a security is expected to come down in the future and hence, the investor decides to sell such a security.

Fundamental analysis thus provides an analytical frame work (EIC frame work) for rational investment decision making.

The purpose of fundamental analysis is to evaluate the present and future earning capacity of a security based on EIC fundamentals and thereby assess the intrinsic value of the security. In its simplest form is focused on the evaluation of intrinsic value of the financial asset. This evaluation is based on the assumption that intrinsic value is the present value of future flows from particular investment. By comparison of the intrinsic value and market value of the financial assets those which are underpriced or overpriced can be identified.

Three Steps of Top-Down Fundamental Analysis are:

- ↳ **Macroeconomic analysis:** evaluates current economic environment and its effect on industry and company fundamentals. Such as fiscal, monetary policy
- ↳ **Industry analysis:** evaluates outlook for particular industries
- ↳ **Company analysis:** evaluates company's strengths and weaknesses within industry.

5.2.1 Economic Analysis

Any economic analysis requires the consideration of inflation. Inflation causes differences between real and nominal interest rates and changes the spending and savings behavior of consumers and corporations. In addition, unexpected changes in the rate of inflation make it difficult for firms to plan, which inhibits growth and innovation. Beyond the impact on

the domestic economy, differential inflation and interest rates influence the trade balance between countries and the exchange rate for currencies.

In addition to monetary and fiscal policy actions, such events as war, political upheavals in foreign countries, or international monetary devaluations produce changes in the business environment that add to the uncertainty of sales and earnings expectations and therefore the risk premium required by investors.

In short, it is difficult to conceive of any industry or company that can avoid the impact of macroeconomic developments that affect the total economy. Because aggregate economic events have a profound effect on all industries and companies within these industries, these macroeconomic factors should be considered before industries are analyzed.

The economy is study to determine if overall conditions are good for the stock market. Is inflation a concern? Are interest rates likely to rise or fall? Are consumers spending? Is the trade balance favorable? Is the money supply expanding (good to invest) or contracting? These are just some of the questions that the fundamental analyst would ask to determine if economic conditions are right for the stock market.

- ✎ The performance of a company depends much on the performance of the economy.
- ✎ If the economy is BOOM, the industries and companies in general said to be prosperous.
- ✎ On the other hand, if the economy is in RECESSION, the performance of companies will be generally poor.
- ✎ Investors are interested in studying those economic varieties, which affect the performance of the company in which they proposed to invest.
- ✎ Some of the key economic variables that can investor must monitor as part of this fundamental analysis:

I. Inflation

Inflation has considerable impact on the performance of companies. Higher rates of inflation upset business plan and reduce purchasing power in the hands of consumers. This will result in lower demand for products. It is the sustainable increase in the general or average price levels commodities. Thus, high rates of inflation in an economy are likely to affect the performance of company's adversely. However, industries and companies prosper during periods of low inflation. Hence an investor has to evaluate the inflation rates prevailing in the economy currently as well as the trend of inflation likely to prevail in the future.

II. Interest Rates

The cost and availability of credit for companies are determined by the rates of interest prevalent in an economy. A low interest rate stimulates investment by making credit available easily and cheaply. As a result, cost of finance for companies decreases which assures higher profitability. On the other hand, higher interest rates result in higher cost of production, which may lead to lower profitability and lower demand. Hence an investor has to consider the interest rates prevailing in the economy and evaluate their impact on the performance and profitability of the companies.

III. Government Revenue, Expenditure & Deficits

Government is the largest investor and spender of money. So the trends in government revenue expenditure deficits have a significant impact on the performance of industries and companies.

IV. Fiscal and Monetary policies.

So, the investor has to evaluate these carefully to assess their impact on his investments. The development of an economy depends very much on the availability of infrastructure. It includes electricity, roads and railways, communication channels, sound banking and financial sectors etc. The availability of infrastructural facilities affects the performance of

companies. While inadequate infrastructure leads to inefficiencies, lower productivity, wastage and delays and vice versa. Thus, an investor should assess the status of infrastructural facilities available in the economy before finalizing his investment avenues.

V. Infrastructure Facilities

The development of an economy is very much on the availability of infrastructure. It includes electricity, roads and railways, communication channels, sound banking and financial sectors etc. The availability of infrastructural facilities affects the performance of companies. While inadequate infrastructure leads to inefficiencies, lower productivity, wastage and delays and vice versa. Thus, an investor should assess the status of infrastructural facilities available in the economy before finalizing his investment avenues.

VI. Monsoon and Agriculture

Agriculture is directly and indirectly linked with the industries. Example: - Sugar, Cotton, Textile and Food processing industries depend upon agriculture for raw-material. A good monsoon leads to higher demand for input and results in bumper crop. This would lead to good spirit in the stock market. When the monsoon is bad, agricultural and power production would suffer. They cast a shadow on the share market.

VII. Political Stability

A stable political environment is necessary for steady and balanced growth. No industry or company can grow and prosper when the country is passing through political instability. The long-term economic policies are needed for industrial growth. Stable policies can be framed only by stable political systems.

5.2.2 Industry Analysis

Industry analysis is a market strategy tool used by businesses to determine if they want to enter a product or service market. Company management must carefully analyze several aspects of the industry to determine if they can make a profit selling goods and services in the market. Analyzing economic factors, supply and demand, competitors, future

conditions and government regulations will help management decide whether to enter an industry or invest money elsewhere.

I. Economic Factors

Economic factors of industry analysis include raw materials, expected profit margins and the interference of substitute goods. The cost of raw materials is an important factor in industry analysis because over-priced goods will not sell in an established market. Profit margins are closely linked to materials costs because offering discounts or sales prices will shrink company profits and lessen cash inflows for future production activity. Substitute goods allow consumers to purchase a cheaper good that performs relatively like the original item.

II. Supply and Demand

A supply and demand analysis help management understand if enough consumers are willing to purchase more goods in an industry. If demand is high and supply is low, a company may be willing to enter the market and offer goods near the market price to gain a competitive advantage in the industry. A trend of declining demand indicates an industry that is oversold, and any new competitors will likely lose money because consumers are not interested in current goods or services.

III. Competitors

The number of competitors is an important factor for proper industry analysis. If few competitors exist in a market, they may be charging consumers higher prices because of limited availability of products or services. As new competitors enter the market, existing companies can lower prices to maintain their current market share; newer competitors may not be able to match these price cuts if their products costs are too high. As industries contract, inefficient producers are forced out.

IV. Future Conditions

While no company managers can predict the future of an industry, they can try to determine where the industry is in the business cycle. If the industry is in an emerging market stage, companies can enter an industry and expect to earn a profit from rising consumer demand. If the industry is in a plateau stage, then only the most efficient producers with the lowest costs can continue to earn profits. At the end of a business cycle, demand is declining and producers leave the industry for more profitable markets.

V. Government Regulations

Some industries have heavier regulations or taxes than others, which must be considered by companies looking to enter new markets. Taxes and other government fees add to the cost of doing business, which eats into profits earned by companies. Properly understanding the amount of government regulation in an industry helps management to determine if expected profit margins will earn a high enough return to cover these costs.

Industry analysis indicates to an investor whether the industry is a growth industry or not. It gives an investor a choice of the industry in which the investments should be made. Industry analysis refers to an evaluation of the relative **strength** and **weakness** of particular industries which can be divided in to **three parts**, viz.

I. Life cycle of an industry

II. Characteristics of an industry

III. Profit potential of an industry

A. Life cycle of an industry

Marketing experts believe that each product has a life cycle. In the same way industry is also said to have a life cycle. They are:

i. **Pioneering Stage:**

Technology and product are newly introduced. There would be severe competition and only fittest companies survive this stage. The producers try to develop brand name, differentiate the product and create a product image. The severe competition often leads to the change of position to the firms in terms of market shares and profit. In this situation, it is difficult to select companies for investment because the survival rate is unknown.

ii. **Growth and Expansion stage:**

This stage starts with the appearance of surviving firms from the pioneering stage. Companies in this stage stabilize their prices, develop a market of their own and follow their own strategies. Ultimately, by showing their competitive strength, the firms are able to maintain their position in the market. This is the best time for the investor to make an investment in companies passing through the expansion stage. The investors can get high returns because demand exceeds supply of the product.

a) **Stagnation Stage**

In this stage the growth of the industries stabilizes. Moreover, sales are increases at slower rate. So, the industry realizes that it cannot expand further. To keep going; technological innovations in the production process and products should be introduced. So, the companies who have taken note of the arrival of stagnation stage have to change their course of action. Likewise, investors too should evaluate their investment in such industry on a continuous basis.

b) **Decay/Declining stage**

In this stage, demand for the particular product and the earnings of the companies in the industry decline. The specific future of the declining stage is that even in the boom period; the growth of the industry would be low and decline at a higher rate during the recession. It is better to avoid investing in the shares of the low growth industry even in the boom period. Investment in the shares of these companies leads to erosion of capital.

B. Characteristics of an industry

In an Industry Analysis the analyst should consider a number of key characteristics:

- ✍ Relationship between Demand & supply
- ✍ Nature of the product
- ✍ Nature of the competition
- ✍ Growth of the industry
- ✍ Labor
- ✍ Government policy
- ✍ Availability of Raw Material
- ✍ Research and development

C. Profit potential of an industry

It depends on the following factors:

a) Threat new entrants:

- ✍ New entrants inflate cost, push down the prices and reduce profitability.
- ✍ An industry which is well protected from the entry of new firms would be ideal for investment.

b) Competitions among existing firms:

- ✍ The firm competes with each other on the basis of price, quality, promotion, service, warranties and so on.
- ✍ If the competition between the firms in an industry is strong average profitability of the industry may be discouraged.

c) Pressure from substitute products:

- ✍ Each firm in an industry faces competition from other firms in the same industry producing substitute products. Ex:- Sony T.V, Samsung T.V etc..
- ✍ Substitute products may affect the profit potential of the industry badly.

The pressure from the substitute products is found to be high under the following circumstances:

- i. When the price of the products is attractive
- ii. When the cost for the prospective buyers to switch over to a substitute product is minimum.
- iii. When the substitute products are earning greater profits

d) (Bargaining power of buyers:

- ☞ Buyers can bargain for price reduction asks for better quality and better service.
- ☞ The bargaining power of a buyer group is said to be high under the following conditions:
 - i. If its capacity to buy is more than the capacity of the seller to sell.
 - ii. If the cost of the switch over to a substitute product is low.

Activity 5.1

- 1. What are the factors that affects an Industry Analysis?**
- 2. Why Industry Analysis is needed?**

5.3 Company Analysis

After determining that an industry's outlook is good, an investor can analyze and compare individual firms' performance within the entire industry using financial ratios and cash flow values. Many financial ratios for firms are valid only when they are compared to the performance of their industries. You undertake company analysis to identify the best company in a promising industry. This involves examining a firm's past performance, but more important, its future prospects. After you understand the firm and its outlook, you can determine its value. In the final step, you compare this estimated "intrinsic" value to the price of the firm's stock and decide whether its stock or bonds are good investments.

At the final stage of fundamental analysis, the investor analyzes the company. This analysis has **two thrusts**:

- ✚ How has the company performed vis-à-vis other similar companies, (cross sectional analysis) and
- ✚ How has the company performed in comparison to earlier years (time series analysis)?

Objectives of Company analysis

Company analysis focuses on finding *attractive firms* by:

- ✚ Analyzing individual firms.
- ✚ Understanding each firm's strengths and risks.
- ✚ Identifying attractive firms with superior management and strong performance (measured by sales and earnings growth).

Stock selection focuses on finding *attractive stocks* by:

- ✚ Computing each stock's intrinsic value.
- ✚ Comparing the intrinsic value to the stock's market price.
- ✚ Identifying attractive stocks, which are substantially undervalued

Significant Factors to be considered for company Analysis

It is imperative that one completes the economic analysis and the industry analysis before a company is analyzed because the company's performance at a period of time is to an extent a reflection of the economy, the situation of the industry.

The different issues regarding a company that should be examined are:

- | | |
|------------------------|--------------|
| i. The Management | iv. Ratios |
| ii. The Company | v. Cash flow |
| iii. The Annual Report | |

1. The Management

The single most important factor one should consider when investing in a company and one often never considered is its management. It is upon the quality, competence and vision of the management that the future of company rests.

A good, competent management can make a company grow while a weak, inefficient management can destroy a thriving company.

2. The Company

An aspect not necessarily examined during an analysis of fundamentals is the company. This is because the company is one's perception of the state of a company - it cannot necessarily be supported by hard facts and figures.

A company may have made losses consecutively for two years or more and one may not wish to touch its shares - yet it may be a good company and worth purchasing into.

- ☞ There are several factors one should look at.
- ☞ How a company is perceived by its competitors?
- ☞ Whether the company is the market leader in its products or in its segment

When you invest in market leaders, the risk is less. The shares of market leaders do not fall as quickly as those of other companies.

- ☞ Company Policies
- ☞ Labor Relations
- ☞ Where the company is located and where its factories are?

3. The Annual Report

The primary and most important source of information about a company is its Annual Report. By law, this is prepared every year and distributed to the shareholders.

The Annual Report is broken down into the following specific parts:

The Director's Report: The Director's Report is a report submitted by the directors of a company to its shareholders, advising them of the performance of the company under their stewardship

The Auditor's Report: The auditor represents the shareholders and it is his duty to report to the shareholders and the general public on the stewardship of the company by its directors. Auditors are required to report whether the financial statements presented do, in fact, present a true and fair view of the state of the company.

The Financial Statements: The published financial statements of a company in an Annual Report consist of its Balance Sheet and other statements.

4. Ratios

No person should invest in a company until he has analyzed its financial statements and compared its performance to what it achieved in the previous years, and with that of other companies.

This can be difficult at times because:

- a) The size of the companies may be different.
- b) The composition of a company's balance sheet may have changed significantly.
- ❖ Ratios can be broken down into **four** broad categories:

A. Profit and Loss Ratios

These show the relationship between two items or groups of items in a profit and loss account or income statement. The more common of these ratios are:

- | | |
|---------------------------------|----------------------------|
| 1. Sales to cost of goods sold. | 3. Net profit to sales and |
| 2. Selling expenses to sales. | 4. Gross profit to sales |

B. Balance Sheet Ratios

These deal with the relationship in the balance sheet such as:

- | | |
|--|-----------------------------|
| 1. Shareholders' equity to borrow funds | 3. Liabilities to net worth |
| 2. Current assets to current liabilities | 4. Debt to assets and |
| | 5. Liabilities to assets |

C. Balance Sheet and Profit and Loss Account Ratios.

These relate an item on the balance sheet to another in the profit and loss account such as:

- | | |
|-------------------------------------|-----------------------------------|
| 1. Earnings to shareholder's funds. | 3. Sales to stock. |
| | 4. Sales to debtors and |
| 2. Net income to assets employed. | 5. Cost of goods sold to creditor |

D. Financial Statements and Market Ratios

These are normally known as market ratios and are arrived at by relation financial figures to market prices:

- | | |
|---------------------------------|--------------------------------|
| 1. Market value to earnings and | 2. Book value to market value. |
|---------------------------------|--------------------------------|

These ratios have been grouped into ***eight categories*** that will enable an investor to easily determine the strengths or weaknesses of a company.

- | | |
|------------------|--------------------------------|
| a) Market value | f) Debt Service Capacity |
| b) Earnings | g) Asset Management/Efficiency |
| c) Profitability | |
| d) Liquidity | h) Margins. |
| e) Leverage | |

Ratios do not provide answers. They suggest possibilities. Investors must examine these possibilities along with general factors that would affect the company such as its management, management policy, government policy, the state of the economy and the industry to arrive at a logical conclusion and he must act on such conclusions.

It involves a close investigation of the company's financial and non-financial aspects with a view to identifying its strength, weaknesses and future business prospects. The financial and non-financial aspects are as follows:

- | | |
|-------------------------|-----------------------|
| i. Marketing success | iv. Capital Structure |
| ii. Accounting Policies | v. Financial analysis |
| iii. Profitability | |

a) **Marketing success**

The success of the market of the firm depends on

- i. The market share of annual sales
- ii. Growth of annual sales
- iii. The stability of annual sales.
- iv. Sales forecast

b) **Accounting Policies**

While analyzing a company, the investor should carefully consider the accounting policies followed by the company.

b1 **Inventory Pricing**

Generally, the prices of inventory change over a period of time. Due to changes in the prices of the inventory, the value of inventory changes during an accounting year.

Example: - FIFO and LIFO

b2 **Depreciation methods**

The amount of depreciation varies depending upon the method employed. Higher amount of depreciation reduces profit while the lower amount of depreciation increases profit.

-  Straight line method
-  Declining balance method

b3 Non-operating income

Non-operating incomes are those items of incomes which are not earned in the routine business of the company.

- Dividend
- Interest

b4 Tax Carry over

A company must take adequate provisions for payment of tax on its earnings. Further, excess tax paid in the previous year may be refunded in the current year and such refund may be adjusted against the tax due in the current year.

The incidence of corporate tax and tax carryover are the factors which the investor should carefully take into consideration

c) Profitability

When an investor buys a security, he is buying the right to the future earnings of the company.

A prudent investor is always interested in stability and growth of the earnings from security.

- | | |
|------------------------|-----------------------|
| a. Gross profit Margin | d. Return on equity |
| b. Net profit Margin | e. Earnings per share |
| c. Earning power | |

Capital Structure

- Generally, companies raise long term funds through the issue of shares and other securities like bonds, debentures etc.
- The capital structure affects return on the equity shareholder's investment.
- Equity holder's return can be increased by using more debts than equity capital.
- So, the investor should study the company's capital structure before take decision.

d) **Financial Analysis**

- ✚ The financial statements of a company provide the best possible information about the profitability and financial soundness of the company.
- ✚ This is the primary source of information for evaluating the prospects of the investment in company's stock.
- ✚ The statement gives the historical and current information about the company's operations.
 - ☞ Income statement Analysis
 - ☞ Balance Sheet Analysis

The analysis of financial statements reveals the nature of relationship between income and expenditure and the sources and application of funds.

To know much about the profitability and the management's policy regarding the dividend, the investor can use the following simple analysis:

- ❖ Comparative statement analysis
- ❖ Trend analysis
- ❖ Common size statements
- ❖ Fund flow analysis
- ❖ Cash flow analysis ratio analysis

Activity 5.2

- 1. What factors are considered in analyzing the Company?**
- 2. What are the objectives of Company analysis?**

5.4 Technical analysis

Technical analysis can be defined as the use of specific market-generated data for the analysis of both aggregate stock prices (market indices or industry averages) and individual stocks. It involves

the analysis of market prices in an attempt to predict future price movements for the particular financial asset traded on the market. This analysis examines the trends of historical prices and is based on the assumption that these ***trends or patterns repeat themselves*** in the future.

The technical approach to investing is essentially a ***reflection of the idea that prices move in trends which are determined by the changing attitudes of investors towards a variety of economic, monetary, political and psychological forces***. The art of technical analysis for it is an art to identify trend changes at an early stage and to maintain an investment posture until the weight of the evidence indicates that the trend is reversed.

Technical analysis is sometimes called market or internal analysis, because it utilizes the record of the market itself to attempt to assess the demand for, and supply of, shares of a stock or the entire market. Thus, technical analysts believe that the market itself is its own best source of data as they say, let the market tell its own story. The theory of technical analysis is that the price movement of a security captures all the information about that security. Technical analysts develop technical trading rules from observations of past price movements of the stock market and individual stocks. The philosophy behind technical analysis is in sharp contrast to the efficient market hypothesis that we studied, which contends that past performance has no influence on future performance or market values.

Fundamental analysis, which involves making investment decisions based on the examination of the economy, an industry, and company variables that lead to an estimate of value for an investment, which is then compared to the prevailing market price of the investment. In contrast to the efficient market hypothesis or fundamental analysis, technical analysis involves the examination of past market data such as prices and the volume of trading, which leads to an estimate of future price trends and, therefore, an investment decision. Whereas fundamental analysts use economic data that are usually separate from the stock or bond market, the technical analyst believes that using data from the market itself is a good idea because “the market is its own best predictor.” Therefore, technical analysis is an alternative method of making the investment decision and answering the questions: What securities should an investor buy or sell? When should these investments be made?

Technical analysts say no need to study the multitude of economic, industry, and company variables to arrive at an estimate of future value because they believe that past price movements will signal future price movements. Technicians also believe that a change in the price trend may predict a forthcoming change in the fundamental variables such as earnings and risk before the change is perceived by most fundamental analysts. Are technicians correct? Many investors using these techniques claim to have experienced superior rates of return on many investments.

In addition, many newsletter writers base their recommendations on technical analysis. Finally, even the major investment firms that employ many fundamental analysts also employ technical analysts to provide investment advice. Numerous investment professionals and individual investors believe in and use technical trading rules to make their investment decisions. Therefore, whether you are a fan of technical analysis or an advocate of the efficient market hypothesis, you should still have an understanding of the basic philosophy and reasoning behind technical approaches. To help you understand technical analysis, we begin this chapter with an examination of the basic philosophy underlying technical approaches to market analysis and company analysis. Subsequently, we consider the advantages and potential problems with the technical approach.

Fundamental analysis is a method of evaluating securities by attempting to measure the intrinsic value of a stock. Fundamental analysts' study everything from the overall economy and industry conditions to the financial condition and management of companies. Technical analysis is the evaluation of securities by means of studying statistics generated by market activity, such as past prices and volume. Technical analysts do not attempt to measure a security's intrinsic value but instead use stock charts to identify patterns and trends that may suggest what a stock will do in the future. In the world of stock analysis, fundamental and technical analyses are on completely opposite sides of the spectrum. Earnings, expenses, assets and liabilities are all important characteristics to fundamental analysts, whereas technical analysts could not care less about these numbers. Which strategy works best is always debated, and many volumes of textbooks have been written on both of these methods. So, do some reading and decide for yourself which strategy works best with your investment philosophy.

The primary difference can be summed up in terms of both the underlying philosophy, and the data studied. Fundamental analysis is concerned chiefly with discovering asset values. The data

relied upon includes off exchange sources such as balance sheets, income statements and supply and demand statistics. Technical analysis on the other hand, is concerned chiefly with the timing of buy and sells decisions. The data studied is generated exclusively by the exchanges. Where does investor sentiment fall within these two definitions? If the sentiment data is derived from options data, then it would fit the definition of technical analysis. If on the other hand the data was generated by opinion polls, then it would not fit the definition of technical analysis. Nor would it be considered fundamental analysis either. It would more properly and simply be defined as sentiment analysis. While there is some debate over whether off-exchange data (e.g. astrological data, dividends, opinion polls, etc.) properly belong under the definition of technical analysis, none of the main organizing bodies for technical analysis have ever rendered an official, public opinion on this question.

Technical analysis is the forecasting of markets through the study and analysis of data generated exclusively from the buying and selling of financial instruments. It is part science and part formalization of trader intuition and experience. Any market for which there is a regular, transparent transaction history is a candidate for technical analysis. Planetary cycles, opinion polls, fundamental, monetary and economic data as well as any data not specifically generated from the buying and selling process, are not a part of orthodox technical analysis.

Assumptions of Technical Analysis

Technical analysts base trading decisions on examinations of prior price and volume data to determine past market trends from which they predict future behavior for the market as a whole and for individual securities. **Several assumptions** lead to this view of price movements:

1. The market value of any good or service is determined solely by the interaction of supply and demand.
2. Supply and demand is governed by numerous rational and irrational factors. These factors are those economic variables relied on by the fundamental analyst as well as opinions, moods, and guesses. The market weighs all these factors continually and automatically.
3. Disregarding minor fluctuations, the prices for individual securities and the overall value of the market tend to move in trends, which persist for appreciable lengths of time.

4. Prevailing trends change in reaction to shifts in supply and demand relationships. These shifts, no matter why they occur, can be detected sooner or later in the action of the market itself.

Certain aspects of these assumptions are controversial, leading fundamental analysts and advocates of efficient markets to question their validity. Those aspects are emphasized in the preceding list.

The first two assumptions are almost universally accepted by technicians and non-technicians alike. Almost anyone who has had a basic course in economics would agree that, at any point in time, the price of a security (or any good or service) is determined by the interaction of supply and demand. In addition, most observers would acknowledge that supply and demand are governed by many variables. The only difference in opinion might concern the influence of the irrational factors. Certainly, everyone would agree that the market continually weighs all these factors. A stronger difference of opinion arises over the assumption about the speed of adjustment of stock prices to changes in supply and demand. Technical analysts expect stock prices to move in trends that persist for long periods because they believe that new information does not come to the market at one point in time but, rather, enter the market over a period of time. This pattern of information access occurs because of different sources of information or because certain investors receive the information or perceive fundamental changes earlier than others. As various groups ranging from insiders to well-informed professionals to the average investor receive the information and buy or sell a security accordingly, its price moves gradually toward the new equilibrium. Therefore, technicians do not expect the price adjustment to be as abrupt as fundamental analysts and efficient market supporters do, but expect a gradual price adjustment to reflect the gradual flow of information.

Technical analysis is a method of evaluating securities by analyzing the statistics generated by market activity, such as past prices and volume. Technical analysts do not attempt to measure a security's intrinsic value, but instead use charts and other tools to identify patterns that can suggest future activity. Just as there are many investment styles on the fundamental side, there are also many different types of technical traders. Some rely on chart patterns; others use technical indicators and oscillators, and most use some combination of the two. In any case, technical analysts' exclusive use of historical price and volume data is what separates them from their

fundamental counterparts. Unlike fundamental analysts, technical analysts don't care whether a stock is undervalued - the only thing that matters is a security's past trading data and what information this data can provide about where the security might move in the future.

The field of technical analysis is based on **three assumptions**:

- 1 the market discounts everything.
2. Price moves in trends.
3. History tends to repeat itself.

1. The Market Discounts Everything

A major criticism of technical analysis is that it only considers price movement, ignoring the fundamental factors of the company. However, technical analysis assumes that, at any given time, a stock's price reflects everything that has or could affect the company - including fundamental factors. Technical analysts believe that the company's fundamentals, along with broader economic factors and market psychology, are all priced into the stock, removing the need to actually consider these factors separately. This only leaves the analysis of price movement, which technical theory views as a product of the supply and demand for a particular stock.

2. Price Moves in Trends

In technical analysis, price movements are believed to follow trends. This means that after a trend has been established, the future price movement is more likely to be in the same direction as the trend than to be against it. Most technical trading strategies are based on this assumption.

3. History of Trends to Repeat Itself

Another important idea in technical analysis is that history tends to repeat itself, mainly in terms of price movement. The repetitive nature of price movements is attributed to market psychology; in other words, market participants tend to provide a consistent reaction to similar market stimuli over time. Technical analysis uses chart patterns to analyze market movements and understand trends. Although many of these charts have been used for more than 100 years, they are still believed to be relevant because they illustrate patterns in price movements that often repeat themselves.

Advantages of Technical Analysis

Although technicians understand the logic of fundamental analysis, technical analysts see benefits in their approach compared to fundamental analysis. Most technical analysts admit that a fundamental analyst with good information, good analytical ability, and a keen sense of information's impact on the market should achieve above-average returns. However, this statement requires qualification.

According to technical analysts, it is important to recognize that the fundamental analysts can experience superior returns only if they obtain new information before other investors and process it correctly and quickly. Technical analysts do not believe the vast majority of investors can consistently get new information before other investors and consistently process it correctly and quickly. In addition, technical analysts claim that a major advantage of their method is that it is not heavily dependent on financial accounting statements the major source of information about the past performance of a firm or industry the fundamental analyst evaluates such statements to help project future return and risk characteristics for industries and individual securities. The technician points out several major problems with accounting statements.

1. They lack a great deal of information needed by security analysts, such as information related to sales, earnings, and capital utilized by product line and customers.
2. According to GAAP (generally accepted accounting principles), corporations may choose among several procedures for reporting expenses, assets, or liabilities. Notably, these alternative procedures can produce vastly different values for expenses, income, return on assets, and return on equity. As a result, an investor can have trouble comparing the statements of two firms in the same industry, much less firms in different industries.
3. Many psychological factors and other non-quantifiable variables do not appear in financial statements. Examples include employee training and loyalty, customer goodwill, and general investor attitude toward an industry. Investor attitudes could be important when investors become concerned about the risk from restrictions or taxes on products such as tobacco or alcohol or when firms do business in countries that have significant political risk.

Therefore, because technicians are suspicious of financial statements, they consider it advantageous not to depend on them. As we will show, most of the data used by technicians, such as security prices, volume of trading, and other trading information, is derived from the stock market itself. Also, a fundamental analyst must process new information correctly and quickly to derive a new intrinsic value for the stock or bond before the other investors can.

Technicians, on the other hand, only need to quickly recognize a movement to a new equilibrium value for whatever reason that is, they do not need to know about an event and determine the effect of the event on the value of the firm and its stock. Finally, assume a fundamental analyst determines that a given security is under- or overvalued a long time before other investors. He or she still must determine when to make the purchase or sale. Ideally, the highest rate of return would come from making the transaction just before the change in market value occurs. For example, assume that based on your analysis in February, you expect a firm to report substantially higher earnings in June. Although you could buy the stock in February, you would be better off waiting until about May to buy the stock so your funds would not be tied up for an extra three months, but you may be reticent to wait that long. Because most technicians do not invest until the move to the new equilibrium is underway, they contend that they are more likely to experience ideal timing compared to the fundamental analyst.

Activity 5.3

- 1. How Does Technical Analysis Differ from Fundamental Analysis?**
- 2. What are the assumptions of Technical Analysis?**

Summary

- ☞ Security analysis is examining several relevant types of investment vehicles (Instrument) and the individual vehicles inside these groups. Like Stock, Bond, Money Market etc. One purpose of such analysis is to identify those investment vehicles (types) that currently appear to be mispriced.
- ☞ Technical analysis is a method of evaluating securities by analyzing the statistics generated by market activity, such as past prices and volume. Technical analysts do not attempt to measure a security intrinsic value, but instead use charts and other tools to identify patterns that can Fundamental analysis, which involves making investment decisions based on the examination of the economy, an industry, and company variables that lead to an estimate of value for an investment, which is then compared to the prevailing market price of the investment.
- ☞ In contrast to the efficient market hypothesis or fundamental analysis, technical analysis involves the examination of past market data such as prices and the volume of trading, which leads to an estimate of future price trends and, therefore, an investment decision. Whereas fundamental analysts use economic data that are usually separate from the stock or bond market, the technical analyst believes that using data from the market itself is a good idea because “the market is its own best predictor.” suggests future activity.
- ☞ Any economic analysis requires the consideration of inflation. Inflation causes differences between real and nominal interest rates and changes the spending and savings behavior of consumers and corporations. In addition, unexpected changes in the rate of inflation make it difficult for firms to plan, which inhibits growth and innovation. Beyond the impact on the domestic economy, differential inflation and interest rates influence the trade balance between countries and the exchange rate for currencies.
- ☞ Industry analysis is a market strategy tool used by businesses to determine if they want to enter a product or service market. Company management must carefully analyze several aspects of the industry to determine if they can make a profit selling goods and services in the market.

Self-Test Exercise

Part I: multiple choice

Choose the best answer among the given alternatives

1. Of the following one is not true about Fundamental Analysis. Identify
 - A. The purpose of fundamental analysis is to evaluate the present and future earning capacity of a security
 - B. It is based on the basic premise that security price is determined by a number of fundamental factors relating to the economy, industry and company.
 - C. Technical analysis can be defined as the use of specific market-generated data for the analysis of both aggregate stock prices and individual stocks.
 - D. All except A & B
 - E. None of the above
2. Which one of the following is true?
 - A. Fundamental analysts' study everything from the overall economy and industry conditions to the financial condition and management of companies.
 - B. Technical analysis is the evaluation of securities by means of studying statistics generated by market activity.
 - C. Technical analysts do not attempt to measure a security's intrinsic value but instead use stock charts to identify patterns and trends that may suggest what a stock will do in the future.
 - D. All of the above
 - E. None of the above
3. Among the following one is wrong about the characteristics of an Industry. Identify
 - A. Relationship between Demand & supply
 - B. Nature of the product
 - C. Nature of the competition
 - D. Growth of the industry
 - E. All of the above
 - F. None of the above
4. All are an important factor to be considered for company Analysis Except;

- A. The Company
 - B. The Annual Report
 - C. Research and development
 - D. All of the above
 - E. None of the above
5. The key variables commonly used to describe the state of the macro-economy are:
- A. Growth rate of gross domestic product
 - B. Savings and investments
 - C. Inflation
 - D. Interest Rates
 - E. All of the above

Part II: fill in the blank space

➤ ***Fill the appropriate terms or phrases in the blank space***

1. _____ Analysis is a market strategy tool used by businesses to determine if they want to enter a product or service market.
2. _____ is the total value of currently produced final goods and services that are produced within a country's boundary during a given period of time, usually one year.
3. _____ are investors those who don't want to take a risk and choose instruments that do not show much variation in returns.
4. _____ Analysis is sometimes called market or internal analysis, because it utilizes the record of the market itself to attempt to assess the demand for, and supply of, shares of a stock or the entire market.
5. Security Analysis is made up of _____ and _____ Components.

Part III: short answer

1. Discuss the relationship between Economic, Industry & Company Analysis.
2. What is the contribution of one analysis to another?
3. Discuss the difference & Similarities between Fundamental Analysis & Technical Analysis.

CHAPTER SIX

PORTFOLIO THEORY

Chapter objectives

After studying this chapter, you should be able to:

- Discuss the portfolio management elements
- Identify the concepts of the diversification and portfolio risk
- Explain the Portfolio Returns and Risk
- Discuss the procedures used to allocate assets between across risky and risk-free portfolios
- Describe the optimal risky portfolio with a risk-free asset

6.1 Introduction

Portfolio is group of securities held by an individual or institutional investor, which may contain a variety of common and preferred stocks, corporate and municipal bonds, certificates of deposit, and treasury bills-that is, appropriate selections from the equity, capital, and money markets. It was introduced by Harry Markowitz around 1952 by adopting modern portfolio theory from traditional saying ‘don’t put all your eggs in one basket’. The logic is that an investor who puts all of their funds into one investment risks everything on the performance of that individual investment. A wiser policy would be to spread the funds over several investments (establish a portfolio) so that the unexpected losses from one investment may be offset to some extent by the unexpected gains from another. Thus, the key motivation in establishing a portfolio is the reduction of risk.

Portfolio is selecting combination of security that maximizes return and minimizing risk depends up on: - stump

- ↳ Investors preference
- ↳ Investors objective

↳ Investors capacity, knowledge, and potential saving

6.2 Elements of Portfolio Management

The basic objective of portfolio management is to maximize yield and minimize risk. To meet this objective investment manager should consider the following elements of investment management:

Safety of the investment: The first important objective of a portfolio, no matter who owns it, is to ensure that the investment is absolutely safe. Other considerations like income, growth, etc., only come into the picture after the safety of your investment is ensured.

Stable Current Return: Once investment safety is guaranteed, the portfolio should yield a steady current income. The current returns should at least match the opportunity cost of the funds of the investor. What we are referring to here current income by way of interest of dividends, not capital gains.

Appreciation in the value of capital: A good portfolio should appreciate in value in order to protect the investor from any erosion in purchasing power due to inflation. In other words, a balanced portfolio must consist of certain investments, which tend to appreciate in real value after adjusting for inflation.

Marketability: A good portfolio consists of investment, which can be marketed without difficulty. If there are too many unlisted or inactive shares in your portfolio, you will face problems in encasing them, and switching from one investment to another. It is desirable to invest in companies listed on major stock exchanges, which are actively traded.

Liquidity: The portfolio should ensure that there are enough funds available at short notice to take care of the investor's liquidity requirements. It is desirable to keep a line of credit from a bank for use in case it becomes necessary to participate in right issues, or for any other personal needs.

Minimizing Tax liability: Since taxation is an important variable in total planning, a good portfolio should enable its owner to enjoy a favorable tax shelter. The portfolio should be

developed considering not only income tax, but capital gains tax, and gift tax, as well. What a good portfolio aims at is tax planning, not tax evasion or tax avoidance

6.3 Diversification and Portfolio risk

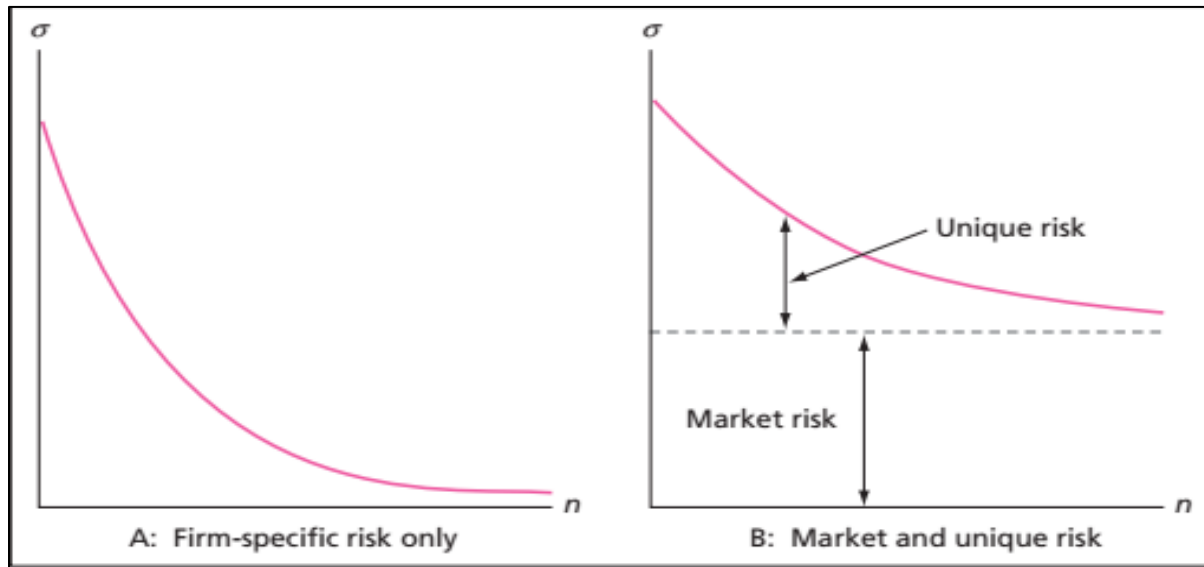
Suppose you have in your risky portfolio only one stock, say, ERO furniture Corporation. What are the sources of risk affecting this “portfolio”? We can identify two broad sources of uncertainty. The first is the risk that has to do with general economic conditions, such as the business cycle, the inflation rate, interest rates, exchange rates, and so forth. None of these macroeconomic factors can be predicted with certainty, and all affect the rate of return ERO stock eventually will provide. Then you must add to these macro factors firm-specific influences, such as ERO’s success in research and development, its management style and philosophy, and so on. Firm-specific factors are those that affect ERO without noticeably affecting other firms.

Now consider a naive diversification strategy, adding another security to the risky portfolio. If you invest half of your risky portfolio in mint oil company’s share, leaving the other half in ERO, what happens to portfolio risk? Because the firm-specific influences on the two stocks differ (statistically speaking, the influences are independent), this strategy should reduce portfolio risk. For example, when oil prices fall, hurting mint oil company, furniture prices might rise, helping ERO. The two effects are offsetting, which stabilizes portfolio return. But why stop at only two stocks? Diversifying into many more securities continues to reduce exposure to firm-specific factors, so portfolio volatility should continue to fall. Ultimately, however, even with a large number of risky securities in a portfolio, there is no way to avoid all risk. To the extent that virtually all securities are affected by common (risky) macroeconomic factors, we cannot eliminate our exposure to general economic risk, no matter how many stocks we hold.

Figure 6.1 illustrates these concepts. When all risk is firm-specific, as in Figure 6.1A, diversification can reduce risk to low levels. With all risk sources independent, and with investment spread across many securities, exposure to any particular source of risk is negligible. This is just an application of the law of averages. The reduction of risk to very

low levels because of independent risk sources is sometimes called the **insurance principle**.

FIGURE 6.1 Portfolio risk as a function of the number of stocks in the portfolio



When common sources of risk affect all firms, however, even extensive diversification cannot eliminate risk. In Figure 6.1B, portfolio standard deviation falls as the number of securities increases, but it is not reduced to zero. The risk that remains even after diversification is called **market risk**, risk that is attributable to market wide risk sources. Other names are **systematic risk** or **non-diversifiable risk**. The risk that can be eliminated by diversification is called **unique risk, firm-specific risk**, nonsystematic risk, or **diversifiable risk**. This analysis is borne out by empirical studies. **International diversification** may further reduce portfolio risk, but here too, global economic and political factors affecting all countries to various degrees will limit the extent of risk reduction.

Activity 6.1

1. What are the elements of investment management?
2. Discuss diversification and portfolio risk?

6.4 Portfolio Returns and Risk

Portfolio return: The expected rate of return on a portfolio is the weighted average of the expected rate of return on assets comprising the portfolio. Two determinants of portfolio return is expected rate of return on each asset/ security and relative share of each asset/ security in the portfolio (portfolio weight). This can be expressed as follows:

$$E[R_p] = \sum_{i=1}^N w_i E[R_i]$$

Where:

$E[R_p]$ = the expected return on the portfolio,

N = the number of stocks in the portfolio,

w_i = the proportion of the portfolio invested in stock i , and

$E[R_i]$ = the expected return on stock i .

For a portfolio consisting of two assets, the above equation can be expressed as

$$E[R_p] = w_1 E[R_1] + (1 - w_1) E[R_2]$$

Example 3.1: A portfolio which value Birr 2000 consist Birr 1000 of stock A and Birr 1000 stock B with expected return of 20% and 10%, respectively.

Calculate portfolio return

Assume weight of stock A and B is 75% and 25%, respectively compute is portfolio return.

Solution: a) $E[R_p] = \sum_{i=1}^N w_i E[R_i]$

$$E(R_p) = 0.5(0.2) + 0.5(0.1) = 0.1 + 0.05 = 0.15 = 15\%$$

$$E(R_p) = 0.75(0.2) + 0.25(0.1) = 0.15 + 0.025 = 0.175 = 17.5\%$$

Portfolio risk: Portfolio variance is **not** the weighted average of variance of returns on individual assets in the portfolio. The variance/standard deviation of a portfolio reflects not only the variance/standard deviation of the stocks that make up the portfolio but also how the returns on the stocks which comprise the portfolio vary together. Two measures of how the returns on a pair of stocks vary together are the covariance and the correlation coefficient.

Covariance of Return: Covariance is a measure of the degree to which two return “move together” relative to their individual mean values over time. In portfolio analysis, we usually are concerned with the covariance of rates of return rather than prices or some other variable.

- ☞ A positive covariance means that the rates of return for two investments tend to move in the same direction relative to their individual means during the same time period.
- ☞ A negative covariance indicates that the rates of return for two investments tend to move in different directions relative to their means during specified time intervals over time.
- ☞ A zero co-variance shows returns on two assets could not show any pattern.

The magnitude of the covariance depends on the variances of the individual return series, as well as on the relationship between the series. For two assets, i and j, the covariance of rates of return is defined as:

$$\text{Cov}_{ij} = \sum_{i=1}^n P_i \{ [R_i - E(R_i)][R_j - E(R_j)] \}$$

Where:

- ✚ Cov_{ij} = the covariance between the returns on stocks i and j,
- ✚ N = the number of years,
- ✚ p_i = the probability of year i,
- ✚ R_i = the return on stock i in year 1,
- ✚ E[R_i] = the expected return on stock i,

- ✚ R_j = the return on stock j in year i , and
- ✚ $E[R_j]$ = the expected return on stock j .

Correlation coefficient: It is a statistical tool that measures the linear relationship between two security return. The correlation could be positive, Negative or Zero. The correlation coefficient always ranges between -1 and +1.

A value of +1 would indicate a perfect positive linear relationship between R_i and R_j , meaning the returns for the two stocks move together in a completely linear manner. A value of -1 indicates a perfect negative relationship between the two return series such that when one stock's rate of return is above its mean, the other stock's rate of return will be below its mean by the comparable amount. A value of zero would mean that the returns had no linear relationship, that is, they were uncorrelated statistically or move randomly. That does not mean that they are independent. The value of $r_{ij} = 0.108$ is quite low. This relatively low correlation is not unusual for stocks in diverse industries.

For two assets, i and j , the coefficient of correlation of rates of return is defined as:

$$r_{ij} = \frac{\text{Cov}_{ij}}{\sigma_i \sigma_j}$$

Where:

r_{ij} = the correlation coefficient of returns

σ_i = the standard deviation of R_{it}

σ_j = the standard deviation of R_{jt}

Correlation vs. Covariance: Basically, Correlation is better than covariance because correlation removes the effect of the variance of the variables; it provides a standardized, absolute measure of the strength of the relationship, bounded by -1.0 and 1.0. This is good because it makes it possible to compare any correlation to any other correlation and see which is stronger. You cannot do this with covariance.

The squared correlation (r^2) is a measure of how much of the variance in one variable is explained by the other variable. This measure, the coefficient of determination, ranges from 0.0 to 1.0. You cannot do this with covariance.

Using either the correlation coefficient or the covariance, the **Variance on a Two-Asset Portfolio** can be calculated as follows:

Then two securities portfolio variance computed as follow:

$$\sigma_{\text{port}} = \sqrt{\sum_{i=1}^n w_i^2 \sigma_i^2 + \sum_{i=1}^n \sum_{\substack{j=1 \\ i \neq j}}^n w_i w_j \text{Cov}_{ij}}$$

Example: In our two-asset portfolio, assume that common stock C and common stock D are available with expected returns and standard deviations as shown:

	Expected (Return)	Standard Deviation (Return)
Stock C	10%	30%
Stock D	25%	60%

Required:

- a. If the weight of both stock what is their expected return?
- b. Again, if they have the same weight and they are correlate with:
 - i. +1
 - ii. -1
 - iii. 0 what is their portfolio risk?

Solution:

- a. If an equal weighting (50%) is assigned to both stocks C and D, the expected portfolio return can be calculated as:

$$E(R_p) = 0.50(10\%) + 0.50(25\%) = 17.5\%$$

- b. The variance of the return on the two-stock portfolio is

$$\begin{aligned}\text{var}(R_p) &= \text{var}(R_C) + \text{var}(R_D) + 2 W_C W_D \text{cov}(R_C, R_D) \\ &= (0.5)^2 (30\%)^2 + (0.5)^2 (60\%)^2 + 2(0.5) (0.5) \text{cov}(R_C, R_D)\end{aligned}$$

From the relationship between correlation and covariance we have:

$$\text{cor}(R_C, R_D) = \frac{\text{cov}(R_C, R_D)}{\text{SD}(R_C)\text{SD}(R_D)}$$

If $\text{cor}(R_C, R_D)$ = correlation of the stock C return and stock D return

$\text{cov}(R_C, R_D)$ = covariance of the stock C return and stock D return

$\text{SD}(R_C)$ = Standard Deviation (stock C Return)

$\text{SD}(R_D)$ = Standard Deviation (stock D Return)

If we solve for covariance of the two stocks:

$$\text{Covariance}(R_C, R_D) = \text{SD}(R_C) \text{SD}(R_D) \text{cor}(R_C, R_D)$$

i. If the stocks perfectly positively correlated

The covariance if the two stock = (30%)(60%) (+1)= 0.18

Then the variance= $(0.5)^2 (30\%)^2 + (0.5)^2 (60\%)^2 + 2(0.5) (0.5)(0.18) = 0.2025$

The standard deviation = $\sqrt{0.2025} = 0.45$

ii. If the stocks perfectly negatively correlated

The covariance if the two stock = (30%)(60%) (-1)= -0.18

Then the variance = $(0.5)^2 (30\%)^2 + (0.5)^2 (60\%)^2 + 2(0.5) (0.5)(-0.18) = 0.0225$

The standard deviation $\sqrt{0.0225} = 0.15$

iii. If the stocks are not correlated

The covariance of the stocks are (30%)(60%) (0)= 0

Then the variance = $(0.5)^2 (30\%)^2 + (0.5)^2 (60\%)^2 + 2(0.5) (0.5)(0) = 0.1125$

The standard deviation $\sqrt{0.1125} = 0.335$

As the correlation between the returns on stocks C and D decreases from +1.0 to 0.0 to -1.0, the standard deviation of the portfolio return also decreases from 45% to 15%. However, the expected portfolio return remains 17.5% for each case.

This example clearly illustrates the effect of Markowitz diversification which states that as the correlation (covariance) between the returns for assets that are combined in a portfolio decreases, so does the variance (hence the standard deviation) of the return for that portfolio. This is due to the degree of correlation between the asset returns. The good news is that investors can maintain expected portfolio return and lower portfolio risk by combining assets with lower (and preferably negative) correlations. However, the bad news is that very few assets have small to negative correlations with other assets! The problem, then, becomes one of searching among large numbers of assets in an effort to discover the portfolio with the minimum risk at a given level of expected return or, equivalently, the highest expected return at a given level of risk.

Activity 6.2

- 1. Oliver's portfolio holds security A, which returned 12.0% and security B, which returned 15.0%. At the beginning of the year 70% was invested in security A and the remaining 30% was invested in security B. Given a standard deviation of 10% for security A, 20% for security B and a correlation coefficient of 0.5 between the two securities,**

Required: calculate the portfolio variance and expected portfolio return of the securities.

6.5 Asset allocation across risky and risk-free portfolios

History shows us that long-term bonds have been riskier investments than investments in Treasury bills and that stock investments have been riskier still. On the other hand, the riskier investments have offered higher average returns. Investors, of course, do not make all-or nothing choices from these investment classes. They can and do construct their portfolios using securities from all asset classes. Some of the portfolio may be in risk-free Treasury bills and some in high-risk stocks.

The most straightforward way to control the risk of a portfolio is through the fraction of the portfolio invested in Treasury bills and other safe money market securities versus risky assets. This is an example of an asset allocation choice—a choice among broad investment

classes, rather than among the specific securities within each asset class. Most investment professionals consider asset allocation the most important part of portfolio construction.

Therefore, we start our discussion of the risk-return trade-off available to investors by examining the most basic asset allocation choice: the choice of how much of the portfolio to place in risk-free money market securities versus other risky asset classes.

We will assume for the sake of illustration that the risky component of the investor's overall portfolio comprises two mutual funds: one invested in stocks and the other invested in long-term bonds. For now, we take the composition of the risky portfolio as given and focus only on the allocation between it and risk-free securities.

The Risky Asset

When we shift wealth from the risky portfolio (P) to the risk-free asset, we do not change the relative proportions of the various securities within the risky portfolio. Rather, we reduce the relative weight of the risky portfolio as a whole in favor of risk-free assets. A simple example demonstrates the procedure. Assume the total market value of an investor's portfolio is Br. 300,000. Of that, Br.90,000 is invested in shares of the Ready Assets money market fund, a risk-free asset. The remaining Br.210,000 is in risky securities, say, Br.113,400 in shares of Vanguard's fund and Br.96,600 in shares of Fidelity's Bond Fund.

The Vanguard fund (V) is a passive equity fund that replicates the S&P 500 portfolio. The Fidelity Bond Fund (IG) invests primarily in corporate bonds with high safety ratings and also in Treasury bonds. We choose these two funds for the risky portfolio in the spirit of a low-cost, well-diversified portfolio.

The holdings of the Vanguard and Fidelity shares make up the risky portfolio, with 54% in V and 46% in IG.

$$\text{Weight of V} = \frac{113,400}{210,000} = 0.54 \text{ (vanguard)}$$

$$\text{Weight of IG} = \frac{96,600}{210,000} = 0.46 \text{ (fidelity)}$$

The weight of the risky portfolio, P, in the complete portfolio, including risk-free as well as risky investments, is denoted by y , and so the weight of the money market fund is $1 - y$.

$$y = 210,000/300,000 = 0.7 \text{ (risky assets, portfolio P)}$$

$$1 - y = 90,000/300,000 = 0.3 \text{ (risk-free assets)}$$

The weights of the individual assets in the complete portfolio (C) are:

Vanguard $113,400/300,000 = 0.378$

Fidelity $96,600/300,000 = \underline{0.322}$

Portfolio P $210,000/300,000 = 0.700$

Ready Assets F $90,000/300,000 = 0.300$

Portfolio C $300,000/300,000 = 1.00$

Suppose the investor decides to decrease risk by reducing the exposure to the risky portfolio from $y = 0.7$ to $y = 0.56$. The risky portfolio would total only $0.56 \times 300,000 =$ Br. 168,000, requiring the sale of Br. 42,000 of the original Br. 210,000 risky holdings, with the proceeds used to purchase more shares in Ready Assets. Total holdings in the risk-free asset will increase to $300,000(1 - 0.56) =$ Br.132,000 (the original holdings plus the new contribution to the money market fund: $90,000 - 42,000 =$ Br. 132,000).

The key point is that we leave the proportion of each asset in the risky portfolio unchanged. Because the weights of Vanguard and Fidelity in the risky portfolio are 0.54 and 0.46, respectively, we sell $0.54 \times 42,000 =$ Br. 22,680 of Vanguard shares and $0.46 \times 42,000 =$ Br.19,320 of Fidelity shares. After the sale, the proportions of each fund in the risky portfolio are

unchanged.

$$w_V = \frac{113,400 - 22,680}{210,000 - 42,000} = 0.54 \text{ (Vanguard)}$$

$$w_G = \frac{96,600 - 19,320}{210,000 - 42,000} = 0.46 \text{ (Fidelity)}$$

This procedure shows that rather than thinking of our risky holdings as Vanguard and Fidelity separately, we may view our holdings as if they are in a single fund holding Vanguard and Fidelity in fixed proportions. In this sense, we may treat the collection of securities in our risky fund as a single risky asset. As we shift in and out of safe assets, we simply alter our holdings of that risky fund commensurately.

With this simplification, we now can turn to the desirability of reducing risk by changing the risky/risk-free asset mix, that is, reducing risk by decreasing the proportion y . Because we do not alter the weights of each asset within the risky portfolio, the probability distribution of the rate of return on the risky portfolio remains unchanged by the asset reallocation. What will change is the probability distribution of the rate of return on the complete portfolio of both risky and risk-free assets.

Activity 6.3

1. **What will be the dollar value of your position in Vanguard and its proportion in your complete portfolio if you decide to hold 50% of your investment budget in Ready Assets?**

The Risk-Free Asset

The power to tax and to control the money supply lets the government, and only the government, issue default-free (Treasury) bonds. The default-free guarantee by itself is not sufficient to make the bonds risk-free in real terms, since inflation affects the purchasing

power of the proceeds from the bonds. The only risk-free asset in real terms would be a price-indexed government bond. Even then, a default-free, perfectly indexed bond offers a guaranteed real rate to an investor only if the maturity of the bond is identical to the investor's desired holding period.

These qualifications notwithstanding, it is common to view Treasury bills as the risk-free asset. Because they are short-term investments, their prices are relatively insensitive to interest rate fluctuations. An investor can lock in a short-term nominal return by buying a bill and holding it to maturity. Any inflation uncertainty over the course of a few weeks, or even months, is negligible compared to the uncertainty of stock market returns.

In practice, most investors treat a broader range of money market instruments as effectively risk-free assets. All the money market instruments are virtually immune to interest rate risk (unexpected fluctuations in the price of a bond due to changes in market interest rates) because of their short maturities, and all are fairly safe in terms of default or credit risk. Money market mutual funds hold, for the most part, three types of securities: Treasury bills, bank certificates of deposit (CDs), and commercial paper. The instruments differ slightly in their default risk. The yields to maturity on CDs and commercial paper, for identical maturities, are always slightly higher than those of T-bills.

Nevertheless, short-term investments as CDs and commercial paper is minuscule compared to that of most other assets, such as long-term corporate bonds, common stocks, or real estate. Hence, we treat money market funds as representing the most easily accessible risk-free asset for most investors.

Portfolio Expected Return and Risk

Now that we have specified the risky portfolio and the risk-free asset, we can examine the risk-return combinations that result from various investment allocations between these two assets. Finding the available combinations of risk and return is the “technical” part of asset allocation; it deals only with the opportunities available to investors given the features of the asset markets in which they can invest. In the next section, we address the “personal”

part of the problem, the specific individual's choice of the best risk-return combination from the set of feasible combinations, given his or her level of risk aversion.

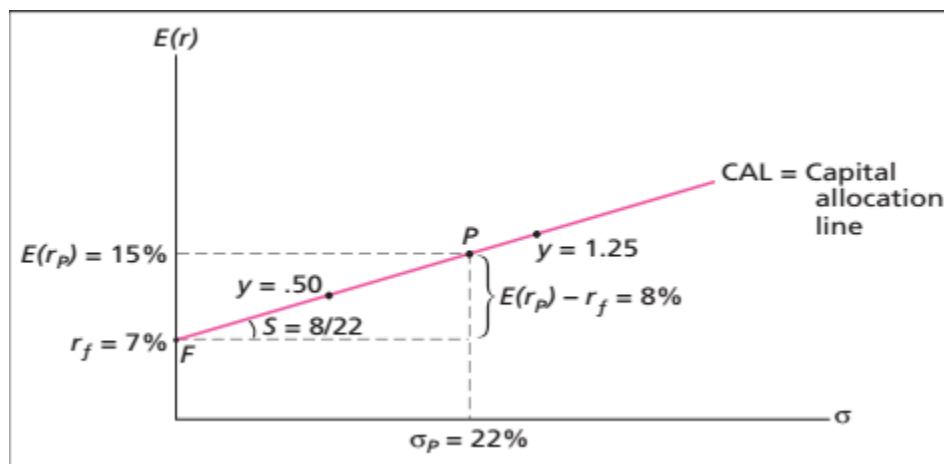
Since we assume the composition of the optimal risky portfolio (P) already has been determined, the concern here is with the proportion of the investment budget (y) to be allocated to it. The remaining proportion ($1-y$) is to be invested in the risk-free asset (F).

We denote the actual risky rate of return by r_P , the expected rate of return on P by $E(r_P)$, and its standard deviation by σ_P . The rate of return on the risk-free asset is denoted as r_f . In the numerical example, we assume $E(r_P) = 15\%$, $\sigma_P = 22\%$, and $r_f = 7\%$. Thus, the risk premium on the risky asset is $E(r_P) - r_f = 8\%$.

Let's start with two extreme cases. If you invest all of your funds in the risky asset, that is, if you choose $y = 1.0$, the expected return on your complete portfolio will be 15% and the standard deviation will be 22%. This combination of risk and return is plotted as point P in

Figure 6.2. At the other extreme, you might put all of your funds into the risk-free asset, that is, you choose $y = 0$. In this case, your portfolio would behave just as the risk-free asset, and you would earn a riskless return of 7%. (This choice is plotted as point F in Figure 6.2.)

FIGURE 6.2 The investment opportunity set with a risky asset and a risk-free asset



Now consider more moderate choices. For example, if you allocate equal amounts of your overall or complete portfolio, C, to the risky and risk-free assets, that is, if you choose $y = 0.5$, the expected return on the complete portfolio will be an average of the expected return on portfolios F and P. Therefore, $E(r_C) = 0.5 \times 7\% + 0.5 \times 15\% = 11\%$. The risk premium of the complete portfolio is therefore $11\% - 7\% = 4\%$, which is half of the risk premium of P. The standard deviation of the portfolio also is one-half of P's, that is, 11%. When you reduce the fraction of the complete portfolio allocated to the risky asset by half, you reduce both the risk and risk premium by half.

To generalize, the risk premium of the complete portfolio, C, will equal the risk premium of the risky asset times the fraction of the portfolio invested in the risky asset.

$$E(r_C) - r_f = y[E(r_P) - r_f]$$

The standard deviation of the complete portfolio will equal the standard deviation of the risky asset times the fraction of the portfolio invested in the risky asset.

$$\sigma_C = y\sigma_P$$

In sum, both the risk premium and the standard deviation of the complete portfolio increase in proportion to the investment in the risky portfolio. Therefore, the points that describe the risk and return of the complete portfolio for various asset allocations, that is, for various choices of y , all plot on the straight-line connecting F and P, as shown in Figure 6.2, with an intercept of r_f and slope (rise/run) of

$$S = \frac{E(r_P) - r_f}{\sigma_P} = \frac{15 - 7}{22} = 0.36$$

Activity 6.4

1. What is the expected return, risk premium, standard deviation, and ratio of risk premium to standard deviation for a complete portfolio with $y = 0.75$?

The Capital Allocation Line

The line plotted in Figure 6.2 depicts the risk-return combinations available by varying asset allocation, that is, by choosing different values of y . For this reason, it is called the capital allocation line, or CAL. The slope, S , of the CAL equals the increase in expected return that an investor can obtain per unit of additional standard deviation. In other words, it shows extra return per extra risk. For this reason, as we noted above, the slope also is called the reward-to-volatility ratio, or Sharpe measure, after William Sharpe who first suggested its use.

Notice that the reward-to-volatility ratio is the same for risky portfolio P and the complete portfolio that was formed by mixing P and the risk-free asset in equal proportions.

	Expected Return	Risk Premium	Standard Deviation	Reward-to-Volatility Ratio
Portfolio P :	15%	8%	22%	$\frac{8}{22} = 0.36$
Portfolio C :	11%	4%	11%	$\frac{4}{11} = 0.36$

In fact, the reward-to-volatility ratio is the same for all complete portfolios that plot on the capital allocation line. While the risk-return combinations differ, the ratio of reward to risk is constant.

What about points on the line to the right of portfolio P in the investment opportunity set? If investors can borrow at the (risk-free) rate of $r_f = 7\%$, they can construct complete portfolios that plot on the CAL to the right of P. They simply choose values of y greater than 1.0.

Risk Tolerance and Asset Allocation

We have developed the CAL, the graph of all feasible risk-return combinations available from allocating the complete portfolio between a risky portfolio and a risk-free asset. The investor confronting the CAL now must choose one optimal combination from the set of feasible choices. This choice entails a trade-off between risk and return. Individual investors with different levels of risk aversion, given an identical capital allocation line, will choose different positions in the risky asset. Specifically, the more risk-averse investors will choose to hold less of the risky asset and more of the risk-free asset.

Graphically, more risk-averse investors will choose portfolios near point F on the capital allocation line plotted in Figure 6.2. More risk-tolerant investors will choose points closer to P, with higher expected return and higher risk. The most risk-tolerant investors will choose portfolios to the right of point P. These levered portfolios provide even higher expected returns, but even greater risk.

The risk-return trade-off, which sometimes is characterized as a decision to “eat well,” versus “sleep well.” You will eat well if you earn a high expected rate of return on your portfolio. However, this requires that you accept a large risk premium and, therefore, a large amount of risk. Unfortunately, this risk may make it difficult to sleep well.

The investor’s asset allocation choice also will depend on the trade-off between risk and return. If the reward-to-volatility ratio increases, then investors might well decide to take on riskier positions. For example, suppose an investor reevaluates the probability

distribution of the risky portfolio and now perceives a greater expected return without an accompanying increase in the standard deviation. This amounts to an increase in the reward-to-volatility ratio or, equivalently, an increase in the slope of the CAL. As a result, this investor will choose a higher y , that is, a greater position in the risky portfolio.

One role of a professional financial adviser is to present investment opportunity alternatives to clients, obtain an assessment of the client's risk tolerance, and help determine the appropriate complete portfolio.

6.6 The optimal risky portfolio with a risk-free asset

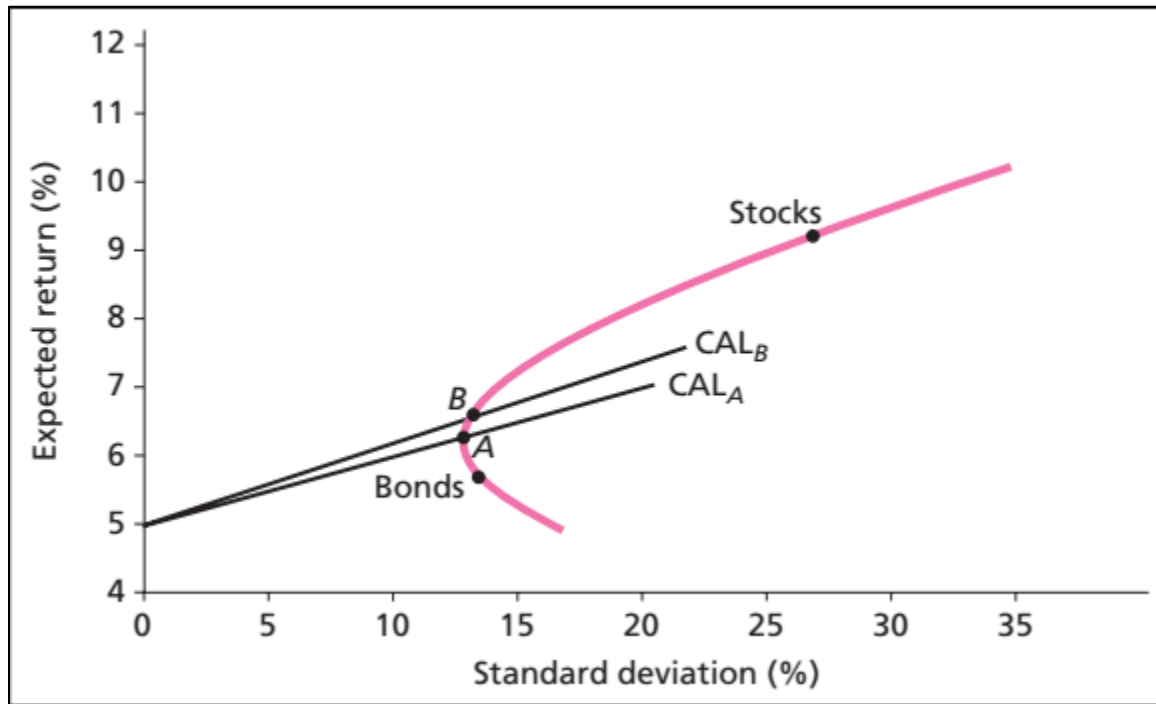
Optimal risky portfolio is the best combination of risky assets to be mixed with safe assets to form the complete portfolio.

To illustrate suppose that the portfolio has two investment assets bond and stock with return for bond 6% and for stock 10%. The standard deviation of each assets is 25% for stock and 12% for bonds. Then that we are confined to the risky bond and stock funds, but now can also invest in risk-free T-bills yielding 5%. And also let assume a realistic correlation coefficient between stocks and bonds is 0.20. Suppose we form a portfolio with 60% invested in the stock fund and 40% in the bond fund.

To see the effect of the risk-free asset on portfolio we can also invest in risk-free T-bills yielding 5%. Figure 6.3 shows the opportunity set generated from the bond and stock funds. Two possible capital allocation lines (CALs) are drawn from the risk-free rate ($r_f = 5\%$) to two feasible portfolios. The first possible CAL is drawn through the minimum-variance portfolio (A), which invests 87.06% in bonds and 12.94% in stocks. Portfolio A's expected return is $(0.06 \times 87.06\% + 0.1 \times 12.94\%) = 6.52\%$ and its standard deviation is $((0.8706)^2 (12\%)^2 + (0.1294)^2 (25\%)^2 + 2(0.8706)(0.1294)(25\%)(12\%)(0.2) = 133.1279 = \sqrt{133.1279}) = 11.54\%$. With a T-bill rate (r_f) of 5%, the reward to-volatility ratio of portfolio A (which is also the slope of the CAL that combines T-bills with portfolio A) is

$$S_A = \frac{E(r_A) - r_f}{\sigma_A} = \frac{6.52 - 5}{11.54} = 0.13$$

FIGURE 6.3 The opportunity set using bonds and stocks and two capital allocation lines



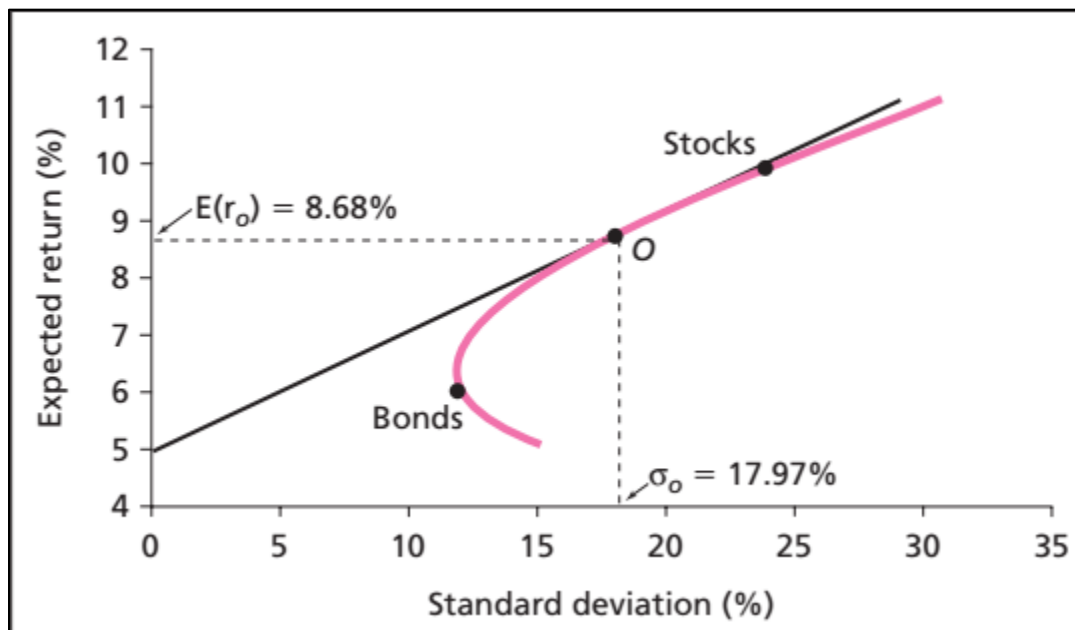
Now consider the CAL that uses portfolio B instead of A. Portfolio B invests 80% in bonds and 20% in stocks, providing an expected return of $(0.06 \times 80\% + 0.1 \times 20\%) = 6.80\%$ with a standard deviation of $\sqrt{((0.80)^2 (12\%)^2 + (0.20)^2 (25\%)^2 + 2(0.80)(0.20)(12\%)(0.2)(25\%)(12\%)(0.2))} = \sqrt{136.36} = 11.68\%$. Thus, the reward-to-volatility ratio of any portfolio on the CAL of B is

$$S_B = \frac{6.80 - 5}{11.68} = .15$$

This is higher than the reward-to-volatility ratio of the CAL of the minimum-variance portfolio A. The difference in the reward-to-volatility ratios is $S_B - S_A = 0.02$. This implies that portfolio B provides 2 extra basis points (0.02%) of expected return for every percentage point increase in standard deviation.

The higher reward-to-volatility ratio of portfolio B means that its capital allocation line is steeper than that of A. Therefore, CAL B plots above CAL A in Figure 6.3. In other words, combinations of portfolio B and the risk-free asset provide a higher expected return for any level of risk (standard deviation) than combinations of portfolio A and the risk-free asset. Therefore, all risk-averse investors would prefer to form their complete portfolio using the risk-free asset with portfolio B rather than with portfolio A. In this sense, portfolio B dominates A. But why stop at portfolio B? We can continue to ratchet the CAL upward until it reaches the ultimate point of tangency with the investment opportunity set. This must yield the CAL with the highest feasible reward-to-volatility ratio. Therefore, the tangency portfolio (O) in Figure 6.4 is the optimal risky portfolio to mix with T-bills, which may be defined as the risky portfolio resulting in the highest possible CAL.

FIGURE 6.4 The optimal capital allocation line with bonds, stocks, and T-bills



We can read the expected return and standard deviation of portfolio O (for “optimal”) off the graph in Figure 6.4 as

$$E(r_o) = 8.68\%$$

$$\sigma_o = 17.97\%$$

$$E(r_O) = 0.1 \times 67.01\% + 0.06 \times 32.99\% = 8.68\%$$

$$\sigma_O = \sqrt{((0.6701)^2 (25\%)^2 + (0.3299)^2 (12\%)^2 + 2(0.6701)(0.3299)(25\%)(12\%)(0.2))} = 17.97\%$$

which can be identified as the portfolio that invests 32.99% in bonds and 67.01% in stocks. These weights may be obtained algebraically from the following formula, which is the solution to the maximization of the reward-to-volatility ratio.

$$w_B = \frac{[E(r_B) - r_f]\sigma_S^2 - [E(r_S) - r_f]\sigma_B\sigma_S\rho_{BS}}{[E(r_B) - r_f]\sigma_S^2 + [E(r_S) - r_f]\sigma_B^2 - [E(r_B) - r_f + E(r_S) - r_f]\sigma_B\sigma_S\rho_{BS}}$$

$$w_S = 1 - w_B$$

$$\frac{(0.06 - 0.05)25^2 - (0.1 - 0.05)25 * 12 * 0.2}{(0.06 - 0.05)25^2 + (0.1 - 0.05)12^2 - ((0.06 - 0.05) + (0.1 - 0.05)25 * 12 * 0.2)}$$

$$= 32.99\%$$

$$w_S = 100 - 32.99\% = 67.01\%$$

The CAL with our optimal portfolio has a slope of

$$S_O = \frac{8.68 - 5}{17.97} = .20$$

which is the reward-to-variability ratio of portfolio O. This slope exceeds the slope of any other feasible portfolio, as it must if it is to be the slope of the best feasible CAL.

In the previous section we saw that the preferred complete portfolio formed from a risky portfolio and a risk-free asset depends on the investor's risk aversion. More risk-averse investors will prefer low-risk portfolios despite the lower expected return, while more risk-tolerant investors will choose higher-risk, higher-return portfolios. Both investors, however, will choose portfolio O as their risky portfolio since that portfolio results in the highest return per unit of risk, that is, the steepest capital allocation line. Investors will

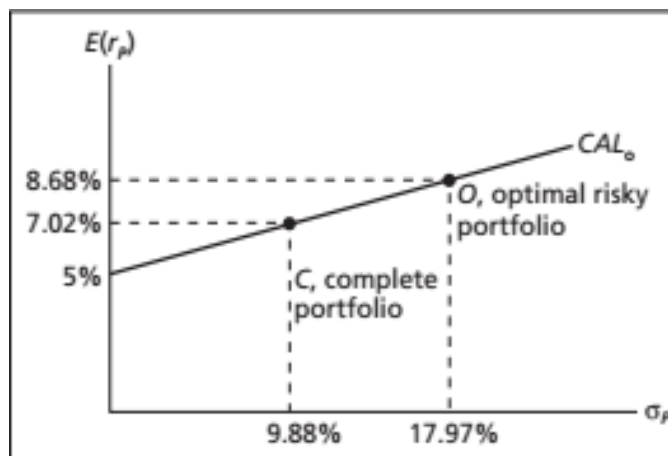
differ only in their allocation of investment funds between portfolio O and the risk-free asset.

Figure 6.5 shows one possible choice for the preferred complete portfolio, C. The investor places 55% of wealth in portfolio O and 45% in Treasury bills. The rate of return and volatility of the portfolio are

$$E(r_C) = 5 + 0.55 \times (8.68 - 5) = 7.02\%$$

$$\sigma_C = 0.55 \times 17.97 = 9.88\%$$

FIGURE 6.5 The complete portfolio



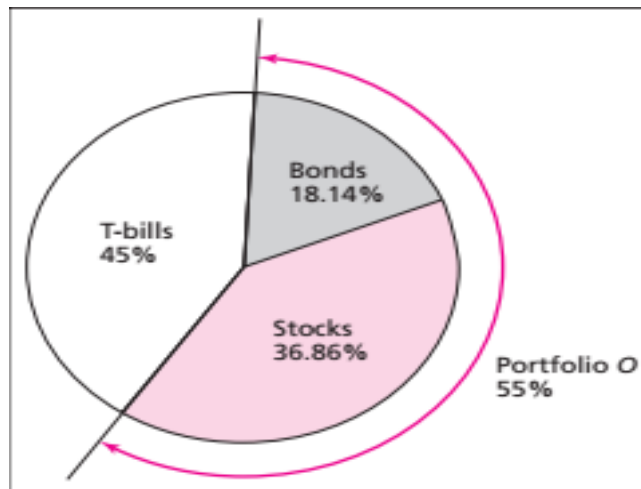
In turn, we found above that portfolio O is formed by mixing the bond fund and stock fund with weights of 32.99% and 67.01%. Therefore, the overall asset allocation of the complete portfolio is as follows:

Weight in risk-free asset		45.00%
Weight in bond fund	$0.3299 \times 55\% =$	18.14
Weight in stock fund	$0.6701 \times 55\% =$	36.86
Total		100.00%

Figure 6.6 depicts the overall asset allocation. The allocation reflects considerations of both efficient diversification (the construction of the optimal risky portfolio, O) and risk

aversion (the allocation of funds between the risk-free asset and the risky portfolio O to form the complete portfolio, C).

FIGURE 6.5 The composition of the complete portfolio: The solution to the asset allocation problem



Summary

- ☞ The basic Markowitz portfolio model derived the expected rate of return for a portfolio of assets and a measure of expected risk, which is the standard deviation of expected rate of return. Markowitz shows that the expected rate of return of a portfolio is the weighted average of the expected return for the individual investments in the portfolio. The standard deviation of a portfolio is a function not only of the standard deviations for the individual investments but also of the covariance between the rates of return for all the pairs of assets in the portfolio. In a large portfolio, these covariances are the important factors.
- ☞ Different weights or amounts of a portfolio held in various assets yield a curve of potential combinations. Correlation coefficients among assets are the critical factor you must consider when selecting investments because you can maintain your rate

of return while reducing the risk level of your portfolio by combining assets or portfolios that have low positive or negative correlation.

- ☞ The basic objective of portfolio management is to maximize yield and minimize risk. To meet this objective investment manager should consider; Safety of the investment, Stable Current Return, appreciation in the value of capital, marketability, liquidity and minimizing tax liability.
- ☞ The most straightforward way to control the risk of a portfolio is through the fraction of the portfolio invested in Treasury bills and other safe money market securities versus risky assets. This is an example of an asset allocation choice—a choice among broad investment classes, rather than among the specific securities within each asset class.
- ☞ Optimal risky portfolio is the best combination of risky assets to be mixed with safe assets to form the complete portfolio.

Self-test exercise

Part I: true or false

Say true if the statement is true and false if the statement is false.

1. The key motivation in establishing a portfolio is the reduction of risk and maximization return of the investment.
2. A good portfolio should depreciate in value in order to protect the investor from any erosion in purchasing power due to inflation.
3. The portfolio should ensure that there are enough funds available at long notice to take care of the investor's liquidity requirements.
4. The expected rate of return on a portfolio is the sum of expected rate of return on assets comprising the portfolio.
5. Covariance coefficient is a statistical tool that measures the linear relationship between two security return.

Part II: Multiple choice

Choose the best answer from the given alternatives.

1. _____ is a measure of the degree to which two return “move together” relative to their individual mean values over time.

A. Correlation
B. Covariance
C. Return
D. All except A

You are considering two assets with the following characteristics:

$$E(R_1) = .15 \quad \sigma_1 = .10 \quad W_1 = 0.5$$

$$E(R_2) = .20 \quad \sigma_2 = .20 \quad W_2 = 0.5$$

2. What is their expected return?

A. 0.175
B. 0.075
C. 0.10
D. 0.15

3. What is their expected risk if the correlation coefficient is 0.40?

A. 0.0165
B. 0.1284
C. 0.0025
D. 0.1812

4. What is their expected risk if the correlation coefficient is -0.60?

A. 0.0065
B. 0.0025
C. 0.081
D. 0.0018

5. What is their expected risk if the correlation coefficient is 0?

A. 0.0125
B. 0.125
C. 0.0111
D. 0.1118

Part III: Workout questions

1. Given: $E(R_1) = .10$ $\sigma_1 = .03$
 $E(R_2) = .15$ $\sigma_2 = .05$

Calculate the expected returns and expected standard deviations of a two-stock portfolio in which Stock 1 has a weight of 60 percent under the following conditions:

- Correlation coefficient = 1.00
- Correlation coefficient = 0.25

- iii. Correlation coefficient = 0.00
 - iv. Correlation coefficient = -0.25
 - v. Correlation coefficient = -1.00
2. A universe of securities includes a risky stock (The data for the universe are: X), a stock index fund (M), and T-bills.

	Expected Return	Standard Deviation
X	15%	50%
M	10	20
T-bills	5	0

The correlation coefficient between X and M is -0.2.

1. Find the optimal risky portfolio (O) and its expected return and standard deviation.
2. Find the slope of the CAL generated by T-bills and portfolio O.
3. Suppose an investor places 2/9 (i.e., 22.22%) of the complete portfolio in the risky portfolio O and the remainder in T-bills. Calculate the composition of the complete portfolio.

CHAPTER SEVEN

PORTFOLIO MANAGEMENT

Chapter objectives

After studying this chapter, you should be able to:

- Discuss the portfolio performance evaluation
- Identify the process of the portfolio management
- Explain risk management and hedging methods
- Discuss the active portfolio management concepts
- Describe international portfolio management

7.1 Introduction

Portfolio is group of securities held by an individual or institutional investor, which may contain a variety of common and preferred stocks, corporate and municipal bonds, certificates of deposit, and treasury bills-that is, appropriate selections from the equity, capital, and money markets. It was introduced by Harry Markowitz around 1952 by adopting modern portfolio theory from traditional saying ‘don’t put all your eggs in one basket’. The logic is that an investor who puts all of their funds into one investment risks everything on the performance of that individual investment. A wiser policy would be to spread the funds over several investments (establish a portfolio) so that the unexpected losses from one investment may be offset to some extent by the unexpected gains from another. Thus, the key motivation in establishing a portfolio is the reduction of risk.

Portfolio is selecting combination of security that maximizes return and minimizing risk depends up on: - stump

- ☞ Investors preference
- ☞ Investors objective
- ☞ Investors capacity, knowledge, and potential saving

Definition: Portfolio Management, implies tactfully managing an investment portfolio, by selecting the best investment mix in the right proportion and continuously shifting them in the portfolio, to increase the return on investment and maximize the wealth of the investor. Here, portfolio refers to a range of financial products, i.e. stocks, bonds, mutual funds, and so forth, that are held by the investors.

Portfolio management involves deciding about the optimal portfolio, matching investment with the objectives, allocation of assets and balancing risk.

7.2 Portfolio Performance Evaluation

The portfolio performance evaluation involves the determination of how a managed portfolio has performed relative to some comparison benchmark. The evaluation can indicate the extent to which the portfolio has outperformed or under-performed, or whether it has performed at par with the benchmark.

The evaluation of portfolio performance is important for several reasons: First, the investor, whose funds have been invested in the portfolio, needs to know the relative performance of the portfolio. The performance review must generate and provide information that will help the investor to assess any need for rebalancing of his investments. • Second, the management of the portfolio needs this information to evaluate the performance of the manager of the portfolio and to determine the manager's compensation, if that is tied to the portfolio performance

Many investors mistakenly base the success of their portfolios on returns alone. Few investors consider the risk involved in achieving those returns. Since the 1960s, investors have known how to quantify and measure risk with the variability of returns, but no single measure actually looked at both risk and return together. Today, there are three sets of performance measurement tools to assist with portfolio evaluations.

The Treynor, Sharpe, and Jensen ratios combine risk and return performance into a single value, but each is slightly different. Which one is best? Perhaps, a combination of all three.

Treynor Measure

Jack L. Treynor was the first to provide investors with a composite measure of portfolio performance that also included risk. Treynor's objective was to find a performance measure that could apply to all investors regardless of their personal risk preferences. Treynor suggested that there were really two components of risk: the risk produced by fluctuations in the stock market and the risk arising from the fluctuations of individual securities.

Treynor introduced the concept of the security market line, which defines the relationship between portfolio returns and market rates of returns whereby the slope of the line measures the relative volatility between the portfolio and the market (as represented by beta). The beta coefficient is the volatility measure of a stock portfolio to the market itself. The greater the line's slope, the better the risk-return tradeoff.

7.3 Process of Portfolio Management

Portfolio management process is an on-going way of managing a client's portfolio of assets. There are various components and sub-components of the process that ensure a portfolio is tailored to meet the client's investment objectives well within his constraints. Portfolio managers need to chart out specific strategies for portfolio management to maintain the risk-return trade-off. The portfolio management process is an integrated compilation of steps implemented in a consistent way to create and manage a suitable portfolio of assets to achieve a client's specified goals.

7.3.1 Portfolio Perspective

The portfolio perspective is the key fundamental principle of portfolio management. According to this perspective, portfolio managers, analysts, and investors need to analyze risk-return trade-off of the whole portfolio, and not of the individual assets in the portfolio. The individual investments carry an unsystematic risk, which is diversified away by bundling the investments into one single portfolio. The whole portfolio carries only the systematic risk, which is caused by the influence of economic fundamentals on the returns of a stock. GDP growth, consumer confidence, unexpected inflation, business cycles, etc.

are examples of such economic fundamentals. The portfolio managers, analysts, and investors should only be concerned with the systematic risk of the whole portfolio. In fact, all the equity pricing models are based on the fact that only systematic risk is factored.

7.3.2 Steps of the portfolio management process

The portfolio management process has the following steps and the sub-components:

A. Planning

This is the most crucial step as it lays down the foundation of the entire process. It comprises of the following tasks:

- a. **Identification of Objectives and Constraints:** The identification of client's investment objectives and any constraints is the foremost task in the planning stage. Any desired outcomes that the client has regarding return and risk are the investment objectives. Any limitations on the investment decisions or choices are the constraints. Both are specified at this stage.
- b. **Investment Policy Statement:** Once the objectives and constraints are identified, the next task is to draft an investment policy statement.
- c. **Capital Market Expectations:** The third step in the planning stage is to form expectations regarding capital markets. Risk and return of various asset classes are forecasted over the long term to choose portfolios that either maximizes the expected return for certain levels of risk or minimize the portfolio risk for certain levels of expected return.
- d. **Asset Allocation Strategy:** This is the last task in the planning stage and have two allocation systems
 - i. **Strategic Asset Allocation:** The investment policy statement and the capital market expectations are combined to determine the long-term weights of the target asset classes, also known as strategic asset allocation.
 - ii. **Tactical Asset Allocation:** Any short-term change in the portfolio strategy as a result of the change in circumstances of the investor or the market expectations is tactical asset allocation. If the changes become permanent

and the policy statement is updated to reflect the changes, there is a chance that the temporary tactical allocation becomes the new strategic portfolio allocation.

B. Execution

Once the planning stage is completed, execution of the planned portfolio is the next step. This consists of these decisions:

- i. **Portfolio Selection:** The expectation of the capital markets is combined with decided investment allocation strategy to choose specific assets for the investor's portfolio. Generally, the portfolio managers use the portfolio optimization technique while deciding the portfolio composition.
- ii. **Portfolio Implementation:** Once the portfolio composition is finalized, the portfolio is executed. Portfolio executions are equally important as high transaction costs can reduce the performance of the portfolio. Transaction costs include both explicit costs like taxes, fees, commissions, etc. and implicit costs like bid-ask spread, opportunity costs, market price impacts, etc. Hence, the execution of the portfolio needs to be appropriately timed and well-managed.

C. Feedback

Any changes required due to the feedback are analyzed carefully to make sure that they are as per the long-run considerations. The feedback stage has the following two sub-components:

- i. **Monitoring and Rebalancing:** The portfolio manager needs to monitor and evaluate risk exposures of the portfolio and compares it with the strategic asset allocation. This is required to ensure that investment objectives and constraints are being achieved. The manager monitors the investor's circumstances, economic fundamentals and market conditions. Portfolio rebalancing should also consider taxes and transaction costs.
- ii. **Performance Evaluation:** The investment performance of the portfolio must be evaluated regularly to measure the achievement of objectives and the skill of the

portfolio manager. Both absolute returns and relative returns can be used as a measure of performance while analyzing the performance of the portfolio.

Investment policy statement

A formal written document created to govern investment decision making after taking into account the client's objectives and constraints. This statement is formulated in the planning stage of the process as mentioned above.

Role: Investment policy statement has the following roles to play:

- ✎ Endorse long-term discipline in all the portfolio decisions.
- ✎ Easily implemented by both current as well as future investment advisors.
- ✎ Protect against short-term portfolio reallocation in case the changing markets or the performance of the portfolio causes overconfidence or panic.

Elements: An investment policy statement has several of these elements:

- ✎ A complete client description providing enough background so that any investment advisor can understand the client's situation.
- ✎ A purpose with respect to investment objectives, policies, goals, portfolio limitations and restrictions.
- ✎ Identification of responsibilities and duties of all the parties involved.
- ✎ A formal statement depicting objectives and constraints.
- ✎ A schedule for reviewing the performance of the portfolio and the policy statement.

Ranges of asset allocation and guidelines regarding rigidity and flexibility when devising or modifying the asset allocation. Instructions for adjustments in the portfolio and rebalancing.

Activity 7.1

1. Discuss and elaborate portfolio performance evaluation.
2. Elaborate the steps in the process of portfolio management.

7.4 Risk Management and Hedging

Risk management is means of minimizing or avoiding risk by employing different tools of risk management. Those tools of risk management are diversification, derivatives and hedging.

Diversification: is means of reducing security risk simply by holding combination of securities which have correlation among each other. The process of spreading an investment across assets is called diversification. Spreading an investment across number of assets will eliminate unsystematic risk, but not all of the risk. Constructing a Portfolio in such a way reduces portfolio risk without sacrificing return. Diversification strategy should take into account the degree of co-variance or correlation between assets return in a portfolio. The co-variance or correlation of asset returns is the measure of the degree to which the returns two assets vary or change together. Combine securities in a portfolio with returns that are less than perfectly positively correlated lower portfolio risk without sacrificing return. Diversification is impossible to unrelated securities/assets/.

Derivatives: Derivatives are those assets whose value is determined from the value of some underlying assets. The underlying asset may be equity, commodity or currency. The derivatives are most modern financial instruments in hedging risk. The individuals and firms who wish to avoid or reduce risk can deal with the others who are willing to accept

the risk for a price. A common place where such transactions take place is called the ‘derivative market’.

As the financial products commonly traded in the derivatives market themselves are not primary loans or securities but can be used to change the risk characteristics of underlying asset or liability position, they are referred to as ‘derivative financial instruments’ or simply ‘derivatives. These instruments are so called because they derive their value from some underlying instrument and have no intrinsic value of their own.

Types of Derivatives

- | | |
|---------------------|----------------------|
| i. Forwards, | iii. Options, |
| ii. Futures, | iv. Swaps |

A. **Forward contract:** A forward contract is an agreement made today between a buyer and seller to exchange the commodity or instrument for cash at a predetermined future date at a price agreed upon today. The agreed upon price is called the ‘forward price’ with a forward market the transfer of ownership occurs on the spot, but delivery of the commodity or instrument does not occur until some future date.

In a forward contract, two parties agree to do a trade at some future date, at a stated price and quantity. No money changes hands at the time the deal is signed. For example, a wheat farmer may wish to contract to sell their harvest at a future date to eliminate the risk of a change in prices by that date. Such transaction would take place through a forward market.

Forward contracts are not traded on an exchange they are said to trade over the counter (OTC). The quantities of the underlying asset and terms of contract are fully negotiable. The secondary markets do not exist for the forward contracts and faces the problems of liquidity and negotiability.

Problems in Forward Contracting

- ↪ Lack of centralization of trading
- ↪ Illiquidity
- ↪ Counter party risk.

Forward markets have one basic property; the larger the time period over which the forward contract is open, the larger are the potential price movements, and hence the larger is the counterparty risk. Even when forward markets trade standardized contracts, and hence avoid the problem of illiquidity, the counterparty risk remains a very real problem.

B. Futures contract: A futures contract is a financial security, issued by an organized exchange to buy or sell a commodity, security or currency at a predetermined future date at a price agreed upon today for future delivery at an agreed price. It is standardized contract, subject to the rules and regulations of the exchange.

It is the standardization of the futures contract facilitates the secondary market trading. The futures contract relates to a given quantity of the underlying asset and only whole contracts can be traded and trading of fractional contracts is not allowed in futures contracting. A futures contract provides both a right and an obligation to buy or sell a standard amount of a commodity, security or currency on a specified future date at a price agreed when the contract is entered.

The important features of futures contract is given below:

- i. **Standardization** - Each futures contract is for a standard specified quantity, grade, coupon rate, maturity etc. The standardization of contracts fetches the potential buyers and sellers and increases the marketability and liquidity of the contracts.
- ii. **Clearing House** - An organization called 'futures exchange' will act as a clearing house. In futures contract, the obligation of the buyer and the seller is not to each other but to the clearing house in fulfilling the contract which ensure the elimination of the default risk on any transaction.
- iii. **Margins** - Since the clearing house undertakes the default risk, to protect itself from this risk, the clearing house requires the participants to keep margin money, normally ranging from 5% to 10% of the face value of the contract.
- iv. **Time spreads** - There is a relationship between the spot price and the futures price of contract. The relationship also exists between prices of futures contracts which are on the same commodity or instrument but which have different expiry dates. The

differences between the prices of two contracts is known as the 'time spread' is the basis of futures market.

- C. **Option:** An option is a contractual agreement that gives the option buyer the right, but not the obligation, to purchase or to sell a specified instrument at a specified price at any time of the option buyer's choosing by or before a fixed date in the future. Upon exercise of the right by the option holder, an option seller is obliged to deliver the specified instrument at the specified price.

Call Option: A call option give the buyer the right but not the obligation to buy a given quantity of the underlying asset, a given price known as 'exercise price' or 'strike price' on or before a given future date called the 'maturity date' or 'expiry date'. A call option gives the buyer the right to buy a fixed number of shares / commodities in a particular security at the exercise price upon the date of expiration of the contract. The seller of an option is known as 'writer'. Unlike the buyer, the writer has no choice regarding the fulfillment of the obligations under the contract. If the buyer wants to exercise his right, the writer must comply. For this asymmetry of privilege, the buyer must pay the writer the option price, which is known as 'premium'.

Buying a Call: The buyer of a call option pays the premium in return for the right to buy the underlying asset at the exercise price 'C'. If at the expiry date of the option, the underlying asset price is above the exercise price, the buyer will exercise the option, pay the exercise price and receives the asset. This may then be sold in the market at spot price and makes profit. Alternatively, the option may be sold immediately prior to expiry to realize a similar profit because at expiry, its value must be equal to the difference between the exercise price and the market price of the underlying asset. If the asset price is below the exercise price, the option will be abandoned by the buyer and his loss will be equal to the premium paid on the purchase of call option.

Writing a Call: The call option writer receives the premium as consideration for bearing the risk of having to deliver the underlying asset is return for being paid the exercise price. If at the expiry, the asset price is above the exercise price, the writer will incur loss because he will have to buy the asset at market price in order to deliver it to the option buyer in exchange for

the lower exercise price. If the asset price is below the exercise price, the call option will not be exercised and the writer will make a profit equal to the option premium.

Put Option: The put option gives the buyer the right, but not the obligation, to sell a given quantity of the underlying asset at a given price on or before a given date. The put option gives the buyer the right to sell the underlying asset at the exercise price up to the date of the contract. The seller of put option is known as 'writer', has no choice regarding the fulfillment of the obligations under the contract. If the buyer wants to exercise his put option, the writer must purchase at exercise price. For this asymmetry of privilege, the buyer of put option must pay the writer, the option price called as 'premium'.

Buying a Put: The buyer of a put option pays the option premium to seller of the underlying asset. If at expiry the asset price is below the exercise price, the buyer will exercise the option, gives the asset and receive the exercise price. If the asset price is at or above the exercise price, the put option will be abandoned and the buyer will incur a loss equal to the option premium.

Writing a Put: The put writer receives the premium for bearing the risk of having to take the underlying asset at the exercise price. If the market price of asset is below the exercise price at expiry, the writer will incur a loss because writer will have to pay the exercise price but will only be able to resell the asset at the lower market price. If the asset is above the exercise price at expiry, the buyer will abandon the put option and the writer will make a profit equal to the option premium received.

- D. **Swaps:** A swap can be defined as the exchange of one stream of future cash flow with another stream of cash flows with different characteristics. A swap is an agreement between two or more people / parties to exchange sets of cash flows over a period in future. E.g Currency Swaps are agreements where by currencies are exchanged at specified exchange rates and specified intervals. The basic purpose of swaps is to lock in the rate. Interest rate Swaps is an agreement whereby one party exchange one set of interest rate payments for another. Most common arrangement is an exchange of fixed interest rate payment for another rate over a time period.

Hedging

Hedging is the use of the contracts to reduce risk. Risk can arise from either taking demanding or supplying a commodity at some time in the future. The current price is known but the price at the time of demand or supply will not be known. A strategy of hedging can be used to guard against unfavorable movements in the product price. It is means of eliminating or reducing risk, especially foreign exchange rate risk that result from fluctuation of exchange rate, that result on multinational company and international trade.

7.5 Active portfolio management

When the portfolio managers actively participate in the trading of securities with a view to earning a maximum return to the investor, it is called active portfolio management. Active portfolio management strategies respond much more to changing expectations. They aim to benefit from the differences between the beliefs of a portfolio manager concerning the valuations and those of the marketplace. Making investments according to a particular style of investment and generating alpha are examples of such active investments.

Active portfolio management focuses on outperforming the market compared to specific bench mark, while passive port portfolio management aims to mimic the investment holding f a particular risk.

An active portfolio management strategy tries to generate maximum value by using as much information that is available and forecasting techniques to outperforming a buy and holding portfolio. It has a long-term aim of moving capital consistent basis into profitable securities.

An active portfolio strategy uses available information and forecasting techniques to seek a better performance than a portfolio that is simply diversified broadly. Essential to all active strategies are expectations about the factors that have been found to influence the performance of an asset class. For example, with active common stock strategies this may include forecasts of future earnings, dividends, or price-earnings ratios. With bond portfolios that are actively managed, expectations may involve forecasts of future interest rates and sector spreads. Active portfolio strategies involving foreign securities may require forecasts of local interest rates and exchange rates.

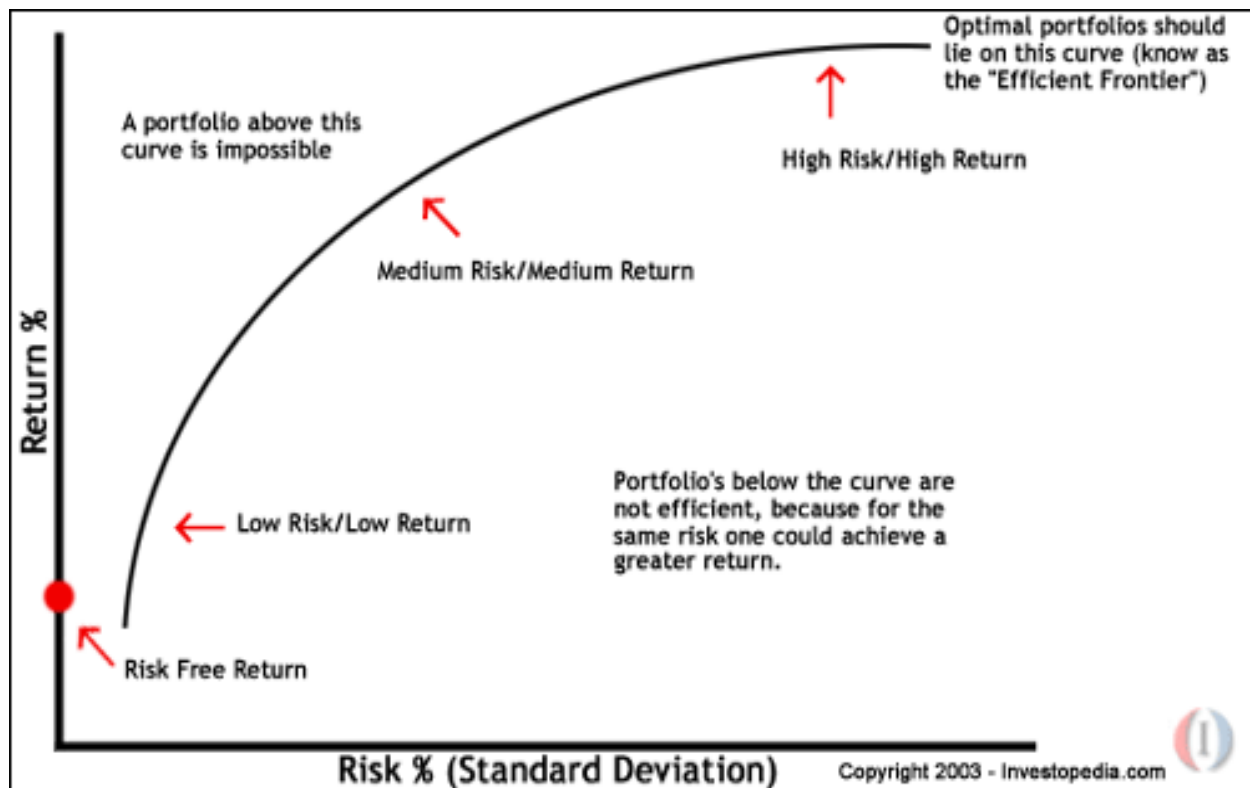
7.6 Portfolio Construction

Portfolio construction refers to the allocation of funds among a variety of financial assets open for investment. It refers to allocation of total investable funds among a wide variety of financial instruments or assets. Portfolio theory concerns itself with the principles governing such allocation to construct optimal portfolio.

The optimal portfolio concept falls under the modern portfolio theory. The theory assumes (among other things) that investors fanatically try to minimize risk while striving for the highest return possible. The theory states that investors will act rationally, always making decisions aimed at maximizing their return for their acceptable level of risk.

The optimal portfolio was used in 1952 by Harry Markowitz, and it shows us that it is possible for different portfolios to have varying levels of risk and return. Each investor must decide how much risk they can handle and then allocate (or diversify) their portfolio according to this decision.

The chart below illustrates how the optimal portfolio works. The optimal-risk portfolio is usually determined to be somewhere in the middle of the curve because as you go higher up the curve, you take on proportionately more risk for a lower incremental return. On the other end, low risk/low return portfolios are pointless because you can achieve a similar return by investing in risk-free assets, like government securities.



7.7 Asset Pricing Model

The single Index Model

The basis of the model is the specification of a process for generating asset returns. This process relates the returns on all the assets that are available to a single underlying variable. This ties together the returns on different assets and by doing so simplifies the calculation of co variances. The single variable can be thought of for now as a summary of financial conditions.

Let there be N assets, indexed by $i = 1 \dots N$. The single index model assumes that the return on asset i can be written as:

$$r_i = \alpha_i + \beta_i r_I + \epsilon_i$$

Where:

r_i = is the return on asset i

r_I = is the return on an index.

α_i and β_i = are constants

ϵ_i = is a random error term.

What this model is saying is that the returns on all assets can be linearly related to a single common influence and that this influence is summarized by the return on an index. Furthermore, the return on the asset is not completely determined by the index so that there is some residual variation unexplained by the index - the random error. As will be shown, if this process for the generation of returns applies, then the calculation of portfolio variance is much simplified.

Before proceeding to describe the further assumptions that are made, some discussion of what is meant by the index will be helpful. The index can be an aggregate of assets such as a portfolio of stocks for all the firms in an industry or sector. Frequently the index is taken to be the market as a whole. When it is, the single index model is usually called the market model and r_I is the return on the market portfolio. As will be shown later the market model has additional implications (concerning the average value of i_I across the assets) beyond those of the general single-index model.

The single-index model is completed by adding to the specification in three assumptions on the structure of the errors, (i_I :

1. The expected error is zero: $E [i_I] = 0, i = 1, N;$
2. The error and the return on the index are uncorrelated: $E [(i_I (r_I - \bar{r}_I))] = 0, i = 1, \dots, N;$
3. The errors are uncorrelated between assets: $E [(i_I(j_I))] = 0, i = 1, \dots, N, j = 1, \dots, N, i \neq j.$

The first assumption ensures that there is no general tendency for the model to over- or under-predict the return on the asset. The second ensures that the error random and unexplained by the return on the index the third assumption requires that there is no other influence that systematically affects the assets.

Capital Asset Pricing Model (CAPM)

Capital Asset Pricing Model (CAPM) formulated by William Sharpe, John Lintner, and Jan Mossin.

The CAPM is an equilibrium asset pricing model derived from a set of assumptions. Here we demonstrate how the CAPM is derived. The CAPM is an abstraction of the real world capital markets and, as such, is based upon some assumptions. These assumptions simplify matters a great deal, and some of them may even seem unrealistic. However, these assumptions make the CAPM more tractable from a mathematical standpoint. The CAPM assumptions are as follows:

CAPM ASSUMPTIONS

- ***Assumption 1.*** Investors make investment decisions based on the expected return and variance of returns.
- ***Assumption 2.*** Investors are rational and risk averse.
- ***Assumption 3.*** Investors subscribe to the Markowitz method of portfolio diversification.
- ***Assumption 4.*** Investors all invest for the same period of time.
- ***Assumption 5.*** Investors have the same expectations about the expected return and variance of all assets.
- ***Assumption 6.*** There is a risk-free asset and investors can borrow and lend any amount at the risk-free rate.
- ***Assumption 7.*** Capital markets are completely competitive and frictionless.

NB: The first five assumptions deal with the way investors make decisions. The last two assumptions relate to characteristics of the capital market. We discuss later in this chapter each assumption.

Because investors are risk averse, they will choose to hold a portfolio of securities to take advantage of the benefits of Diversification. Therefore, when they are deciding whether or not to invest in a particular stock, they want to know how the stock will contribute to the risk and expected return of their portfolios.

The standard deviation of an individual stock does not indicate how that stock will contribute to the risk and return of a diversified portfolio. Thus, another measure of risk is

needed; a measure of a security's **systematic risk**. This measure is provided by the Capital Asset Pricing Model (CAPM).

Systematic and Unsystematic Risk

An asset's total risk consists of both systematic and unsystematic risk.

Systematic risk, which is also called market risk or un diversifiable risk, is the portion of an asset's risk that cannot be eliminated via diversification. The systematic risk indicates how including a particular asset in a diversified portfolio will contribute to the riskiness of the portfolio

Unsystematic risk, which is also called firm-specific or diversifiable risk, is the portion of an asset's total risk that can be eliminated by including the security as part of a diversifiable portfolio.

The Capital Asset Pricing Model (CAPM) provides an expression which relates the expected return on an asset to its systematic risk. The relationship is known as the **Security Market Line (SML)** equation and the measure of systematic risk in the CAPM is called Beta.

The Security Market Line (SML)

The SML equation is expressed as follows:

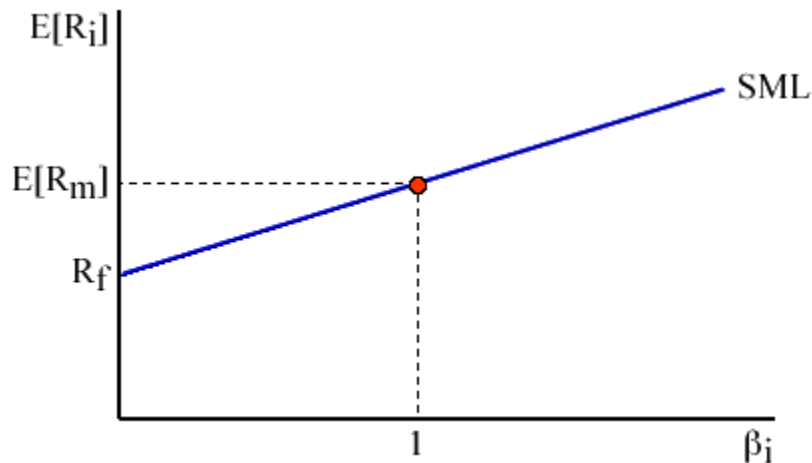
$$E[R_i] = R_f + (E[R_m] - R_f)\beta_i$$

Where:

- $E[R_i]$ = the expected return on asset i,
- R_f = the risk-free rate,
- $E[R_m]$ = the expected return on the market portfolio,

- b_i = the Beta on asset i, and
- $E[R_m] - R_f$ = the market risk premium.

The graph below depicts the SML. Note that the slope of the SML is equal to $(E[R_m] - R_f)$ which is the market risk premium and that the SML intercepts the y-axis at the risk-free rate.



In capital market equilibrium, the required return on an asset must equal its expected return. Thus, the SML equation can also be used to determine an asset's required return given its Beta.

The Beta (B_i)

The beta for a stock is defined as follows:

- Beta is a measure of volatility faced by an asset or portfolio.
- It measures the systematic risk
- It is also called a market risk
- It measures sensitivity of the return of one asset to the market risk

Formula

$$\beta_i = \frac{\sigma_{im}}{\sigma_m^2}$$

Where:

- s_{im} = the Covariance between the returns on asset i and the market portfolio and
- s_m^2 = the Variance of the market portfolio.

Example: Given the percentage returns on the market represented by by the Sensex (sencetive index) and the share of the John for the recent five years.

<u>Year</u>	<u>Market Return (rm) %</u>	<u>John (rj) %</u>
1	18.60	23.46
2	-16.50	-36.13
3	63.83	52.64
4	-20.65	-7.29
5	-17.87	-12.95

Calculate the Beta

Solution

The following **steps** are involved in the calculation of beta;

Step1. Calculate the average return on market (Sensex) and John's share (column 2 & 3)

Step2. Calculate deviation of returns on market from average return (Column 4)

Step3. Calculate deviation of returns on John's share from the average return (Column 5)

Step4. Multiply deviations of returns of market returns and deviations of John's retuns (Column 6) take the sum and divide by 5 (No of observation) to get covariance.

Step5. Calculate the squared deviation of the market returns (Column 7) take the sum and divide by 5 to the variance of market.

Step 6. Divide the covariance of market & John by the market variance to get Beta

<u>Year</u>	<u>Market Return (rm) %</u>	<u>John (rj) %</u>	<u>(rm – r m)</u>	<u>(rj – rj)</u>	<u>(rm - rm)²</u>
1	18.60	23.46	13.11	255.91	171.98
2	-16.50	-36.13	-21.98	880.83	483.08
3	63.83	52.64	58.35	2841.35	3404.85
4	-20.65	-7.29	-26.13	293.64	682.96

5	-17.87	-12.95	-23.35	<u>394.57</u>	<u>545.35</u>
Summation				<u>4,666.30</u>	<u>5,288.23</u>

$$\begin{aligned}\text{Step 4.} \quad \text{Cov}_{mj} &= \frac{4,666.30}{5} \\ &= \underline{933.26}\end{aligned}$$

$$\begin{aligned}\text{Step 5.} \quad S_m^2 &= \frac{5,288.23}{5} \\ &= \underline{1,057.65}\end{aligned}$$

$$\begin{aligned}\text{Step 6.} \quad \beta_i &= \frac{\sigma_{im}}{\sigma_m^2} \\ &= \frac{933.26}{1,057.65} \\ &= \underline{0.88 \text{ or } 88\%}\end{aligned}$$

Note that, by definition, the beta of the market portfolio equals 1 and the beta of the risk-free asset equals 0.

An asset's systematic risk, therefore, depends upon its covariance with the market portfolio. The market portfolio is the most diversified portfolio possible as it consists of every asset in the economy held according to its market portfolio weight.

Example Problems

1. Find the expected return on a stock given that the risk-free rate is 6%, the expected return on the market portfolio is 12%, and the beta of the stock is 2.

$$E[R_i] = 6\% + (12\% - 6\%)2 = 18\%$$

2. Find the beta on a stock given that its expected return is 16%, the risk-free rate is 4%, and the expected return on the market portfolio is 12%.

$$16\% = 4\% + (12\% - 4\%) \beta_i$$
$$\therefore \beta_i = \frac{16\% - 4\%}{12\% - 4\%} = \frac{12\%}{8\%} = 1.5$$

Critical assumptions of CAPM

The CAPM is simple and elegant. Consider the many assumptions that underlie the model. Are they valid?

- **Zero transaction costs.** The CAPM assumes trading is costless so investments are priced to all fall on the capital market line. If not, some investments would hover below and above the line -- with transaction costs discouraging obvious swaps. But we know that many investments (such as acquiring a small business) involve significant transaction costs. Perhaps the capital market line is really a band whose width reflects trading costs.
- **Zero taxes.** The CAPM assumes investment trading is tax-free and returns are unaffected by taxes. Yet we know this to be false: (1) many investment transactions are subject to capital gains taxes, thus adding transaction costs; (2) taxes reduce expected returns for many investors, thus affecting their pricing of investments; (3) different returns (dividends versus capital gains, taxable versus tax-deferred) are taxed differently, thus inducing investors to choose portfolios with tax-favored assets; (4) different investors (individuals versus pension plans) are taxed differently, thus leading to different pricing of the same assets.
- **Homogeneous investor expectations.** The CAPM assumes investors have the same beliefs about expected returns and risks of available investments. But we know that there is massive trading of stocks and bonds by investors with different expectations. We also know that investors have different risk preferences. Again, it may be that the capital market line is a fuzzy amalgamation of many different investors' capital market lines.

- **Available risk-free assets.** The CAPM assumes the existence of zero-risk securities, of various maturities and sufficient quantities to allow for portfolio risk adjustments. But we know even Treasury bills have various risks: *reinvestment risk* -- investors may have investment horizons beyond the T-bill maturity date; *inflation risk* -- fixed returns may be devalued by future inflation; *currency risk* -- the purchasing power of fixed returns may diminish compared to that of other currencies. (Even if investors could sell assets short -- by selling an asset she does not own, and buying it back later, thus profiting from price declines -- this method of reducing portfolio risk has costs and assumes unlimited short-selling ability.)
- **Borrowing at risk-free rates.** The CAPM assumes investors can borrow money at risk-free rates to increase the proportion of risky assets in their portfolio. We know this is not true for smaller, non-institutional investors. In fact, we would predict that the capital market line should become kinked downward for riskier portfolios ($\beta > 1$) to reflect the higher cost of risk-free borrowing compared to risk-free lending.
- **Beta as full measure of risk.** The CAPM assumes that risk is measured by the volatility (standard deviation) of an asset's systematic risk, relative to the volatility (standard deviation) of the market as a whole. But we know that investors face other risks: *inflation risk* -- returns may be devalued by future inflation; and *liquidity risk* -- investors in need of funds or wishing to change their portfolio's risk profile may be unable to readily sell at current market prices. Moreover, standard deviation does not measure risk when returns are not evenly distributed around the mean (non-bell curve). This uneven distribution describes our stock markets where winning companies, like Dell and Walmart, have positive returns (35,000% over ten years) that greatly exceed losing companies' negative returns (which are capped at a 100% loss).

Example: A company's beta is 1.40. The market return is 14%. The risk free rate is 10% (i) What is the expected return based on CAPM (ii) If the risk premium on the market goes up by 2.5% points, what would be the revised expected return on this stock?

Solution

(i) Computation of expected return based on CAPM

$$\begin{aligned} R_j &= R_f + \beta (R_m - R_f) \\ &= 10\% + 1.40 (14\% - 10\%) = 10\% + 5.6\% = 15.6\% \end{aligned}$$

(ii) Computation of risk premium of the market goes up by 2.5 points. The return from the market goes up by 2.5% i.e. $14\% + 2.5\% = 16.5\%$

Expected Return based on CAPM is given by;

$$\begin{aligned} R_j &= 10\% + 1.40 (16.5\% - 10\%) = 10\% + 1.40 \times 6.5\% \\ &= 10\% + 9.1\% = 19.1\% \end{aligned}$$

The risk premium for the market is 10%. Assuming Beta values of 0, 0.25, 0.42, 1.00 and 1.67. Compute the risk premium on Security K

Solution

Market Risk Premium is 10%

<u>B Value of K</u>	<u>Risk Premium of K</u>
0.00	0%
0.25	2.50%
0.42	4.20%
1.00	10.00%
1.67	16.70%

Arbitrage Pricing Theory

The capital asset pricing theory begins with an analysis of how investors construct efficient portfolios. Stephen Ross's arbitrage pricing theory, or APT, comes from a different family entirely. It does not ask which portfolios are efficient. Instead, it starts by *assuming* that each stock's return depends partly on pervasive macroeconomic influences or "factors" and partly on "noise" events that are unique to that company.

The theory doesn't say what the factors are: There could be an oil price factor, an interest-rate factor, and so on. The return on the market portfolio *might* serve as one factor, but then again it might not.

For any individual stock there are two sources of risk. First is the risk that stems from the pervasive macroeconomic factors which cannot be eliminated by diversification. Second is the risk arising from possible events that are unique to the company? Diversification *does* eliminate unique risk, and diversified investors can therefore ignore it when deciding whether to buy or sell a stock. The expected risk premium on a stock is affected by factor or macroeconomic risk; it is *not* affected by unique risk. Arbitrage pricing theory states that the expected risk premium on a stock should depend on the expected risk premium associated with each factor and the stock's sensitivity to each of the factors (b_1, b_2, b_3 , etc.).

Arbitrage pricing theory will provide a good handle on expected returns only if we can (1) identify a reasonably short list of macroeconomic factors, (2) measure the expected risk premium on each of these factors, and (3) measure the sensitivity of each stock to these factors.

Although APT doesn't tell us what the underlying economic factors are, Elton, Gruber, and Mei identified five principal factors that could affect either the cash flows themselves or the rate at which they are discounted. These factors are: Yield spread (the difference between two different yields, or rates), Interest rate, Exchange rate, Real GNP (real GNP - a version of the GNP that has been adjusted for the effects of inflation. GNP is the total market value of goods and services produced by all citizens and capital during a given period), and Inflation. To capture any remaining pervasive influences, Elton, Gruber, and Mei also included a sixth factor, the portion of the market return that could not be explained by the first five.

APT states that the risk premium for any asset depends on its sensitivities to factor risks (b) and the expected risk premium for each factor ($r_{\text{factor}} - r_f$). In this case there are six factors, so

$$= b_1(r_{\text{factor1}} - r_f) + b_2(r_{\text{factor2}} - r_f) + b_3(r_{\text{factor3}} - r_f) \dots b_6(r_{\text{factor6}} - r_f)$$

Expected return = risk-free interest rate + expected risk premium

A Comparison of the Capital Asset Pricing Model and Arbitrage Pricing Theory:

Like the capital asset pricing model, arbitrage pricing theory stresses that expected return depends on the risk stemming from economy wide influences and is not affected by unique risk. You can think of the factors in arbitrage pricing as representing special portfolios of stocks that tend to be subject to a common influence.

If the expected risk premium on each of these portfolios is proportional to the portfolio's market beta, then the arbitrage pricing theory and the capital asset pricing model will give the same answer. In any other case they won't.

CAPM assumes only one source of risk (variance) while multifactor models don't. CAPM holds that the one factor affecting returns is the market. Obviously, multifactor models allow for more than one factor, but not necessarily the market. Arbitrage pricing theory doesn't tell us what the underlying factors are—unlike the capital asset pricing model, which collapses *all* macroeconomic risks into a well-defined *single* factor, the return on the market portfolio.

The Three-Factor Model

A factor model that expands on the capital asset pricing model (CAPM) by adding size and value factors in addition to the market risk factor in CAPM. It was introduced by Fama and French. The three factors and their measures are given below in the following table:

Factor	Measured by
Market factor	Return on market index <i>minus</i> risk-free interest rate
Size factor	Return on small-firm stocks <i>less</i> return on large-firm stocks
Book-to-market factor	Return on high book-to-market-ratio stocks <i>less</i> return on low book-to-market-ratio stocks

Thus, expected risk premium would be:

$$r - r_f = b_{\text{market}} (r_{\text{market factor}}) + b_{\text{size}} (r_{\text{size factor}}) + b_{\text{book-to-market}} (r_{\text{book-to-market factor}})$$

Expected return = risk-free interest rate + expected risk premium.

7.8 International portfolio Management

An international portfolio is a grouping of investment assets that focuses on securities from foreign markets rather than domestic ones. An international portfolio is designed to give the investor exposure to growth in emerging and developed markets and provide diversification.

7.8.1 Breaking Down International Portfolio

An International portfolio allows investors to further diversify their assets by moving away from a domestic-only portfolio. This type of portfolio can carry an increased risk due to potential economic and political instability present in certain emerging markets, but can also bring increased stability through investments in industrialized and more stable foreign markets. The most cost-effective way for investors to hold an international portfolio is to buy an exchange-traded fund (ETF) that focuses on foreign equities, such as the Vanguard FTSE Developed Markets ETF.

Global Portfolio Management, also known as International Portfolio Management or Foreign Portfolio Management, refers to grouping of investment assets from international or foreign markets rather than from the domestic ones. The asset grouping in GPM mainly focuses on securities. The most common examples of Global Portfolio Management are

- ↳ Share purchase of a foreign company
- ↳ Buying bonds that are issued by a foreign government
- ↳ Acquiring assets in a foreign firm

7.8.2 Factors Affecting Global Portfolio Investment

Global Portfolio Management (GPM) requires an acute understanding of the market in which investment is to be made. The major financial factors of the foreign country are the factors affecting GPM. The following are the most important factors that influence GPM decisions.

Tax Rates

Tax rates on dividends and interest earned is a major influencer of GPM. Investors usually choose to invest in a country where the applied taxes on the interest earned or dividend acquired is low. Investors normally calculate the potential after-tax earnings they will secure from an investment made in foreign securities.

Interest Rates

High interest rates are always a big attraction for investors. Money usually flows to countries that have high interest rates. However, the local currencies must not weaken for long-term as well.

Exchange Rates

When investors invest in securities in an international country, their return is mostly affected by

- ☞ The apparent change in the value of the security.
- ☞ The fluctuations in the value of currency in which security is managed.

Investors usually shift their investment when the value of currency in a nation they invest weakens more than anticipated.

7.8.3 Modes of Global Portfolio Management

Foreign securities or depository receipts can be bought directly from a particular country's stock exchange. Two concepts are important here which can be categorized as Portfolio Equity and Portfolio Bonds. These are supposed to be the best modes of GPM. A brief explanation is provided hereunder.

Portfolio Equity

Portfolio equity includes net inflows from equity securities other than those recorded as direct investment and including shares, stocks, depository receipts (American or global), and direct purchases of shares in local stock markets by foreign investors.

Portfolio Bonds

Bonds are normally medium to long-term investments. Investment in Portfolio Bond might be appropriate for you if –

- ☞ You have additional funds to invest.
- ☞ You seek income, growth potential, or a combination of the two.
- ☞ You don't mind locking your investment for five years, ideally longer.
- ☞ You are ready to take some risk with your money.
- ☞ You are a taxpayer of basic, higher, or additional-rate category.

Global Mutual Funds

Global mutual funds can be a preferred mode if the Investor wants to buy the shares of an internationally diversified mutual fund. In fact, it is helpful if there are open-ended mutual funds available for investment.

Closed-end Country Funds

Closed-end funds invest in international securities against the portfolio. This is helpful because the interest rates may be higher, making it more profitable to earn money in that particular country. It is an indirect way of investing in a global economy. However, in such investments, the investor does not have ample scope for reaping the benefits of diversification, because the systematic risks are not reducible to that extent.

7.8.4 Drawbacks of Global Portfolio Management

Global Portfolio Management has its share of drawbacks too. The most important ones are listed below.

Unfavorable Exchange Rate Movement – Investors are unable to ignore the probability of exchange rate changes in a foreign country. This is beyond the control of the investors. These changes greatly influence the total value of foreign portfolio and the earnings from the investment. The weakening of currency reduces the value of securities as well.

Frictions in International Financial Market – There may be various kinds of market frictions in a foreign economy. These frictions may result from Governmental control, changing tax laws, and explicit or implicit transaction costs. The fact is governments actively seek to administer international financial flows. To do this, they use different forms of control mechanisms such as taxes on international flows of FDI and applied restrictions on the outflow of funds.

Manipulation of Security Prices – Government and powerful brokers can influence the security prices. Governments can heavily influence the prices by modifying their monetary and fiscal policies. Moreover, public sector institutions and banks swallow a big share of securities traded on stock exchanges.

Unequal Access to Information – Wide cross-cultural differences may be a barrier to GPM. It is difficult to disseminate and acquire the information by the international investors beforehand. If information is tough to obtain, it is difficult to act rationally and in a prudent manner.

Activity 7.2

- 1. Discuss risk management and hedging**
- 2. Discuss active portfolio management and international portfolio management.**

Summary

- ☞ Portfolio is group of securities held by an individual or institutional investor, which may contain a variety of common and preferred stocks, corporate and municipal bonds, certificates of deposit, and treasury bills-that is, appropriate selections from the equity, capital, and money markets.
- ☞ Many investors mistakenly base the success of their portfolios on returns alone. Few investors consider the risk involved in achieving those returns.
- ☞ Since the 1960s, investors have known how to quantify and measure risk with the variability of returns, but no single measure actually looked at both risk and return together.
- ☞ Today, there are three sets of performance measurement tools to assist with portfolio evaluations.
- ☞ **Portfolio management** process is an on-going way of managing a client's portfolio of assets. There are various components and sub-components of the process that ensure a portfolio is tailored to meet the client's investment objectives well within his constraints.
- ☞ Portfolio managers need to chart out specific strategies for portfolio management to maintain the risk-return trade-off. The portfolio management process is an integrated compilation of steps implemented in a consistent way to create and manage a suitable portfolio of assets to achieve a client's specified goals.
- ☞ The portfolio perspective is the key fundamental principle of **portfolio management**. According to this perspective, portfolio managers, analysts, and investors need to analyze risk-return trade-off of the whole portfolio, and not of the individual assets in the portfolio.
- ☞ The individual investments carry an unsystematic risk, which is diversified away by bundling the investments into one single portfolio.
- ☞ The whole portfolio carries only the systematic risk, which is caused by the influence of economic fundamentals on the returns of a stock. GDP growth,

consumer confidence, unexpected inflation, business cycles, etc. are examples of such economic fundamentals.

- ☞ The portfolio managers, analysts, and investors should only be concerned with the systematic risk of the whole portfolio. In fact, all the equity pricing models are based on the fact that only systematic risk is factored.
- ☞ When the portfolio managers actively participate in the trading of securities with a view to earning a maximum return to the investor, it is called active portfolio management.
- ☞ Active portfolio management strategies respond much more to changing expectations. They aim to benefit from the differences between the beliefs of a portfolio manager concerning the valuations and those of the marketplace.
- ☞ Making investments according to a particular style of investment and generating alpha are examples of such active investments.
- ☞ An International portfolio allows investors to further diversify their assets by moving away from a domestic-only portfolio.
- ☞ This type of portfolio can carry an increased risk due to potential economic and political instability present in certain emerging markets, but can also bring increased stability through investments in industrialized and more stable foreign markets.

Self- test exercise

Part I

Say true if the statement is true and say false if the statement is false

1. The risk management of security is the key fundamental principle of portfolio management.
2. An International portfolio allows investors to further diversify their assets by moving in to a domestic-only portfolio.

3. An active portfolio strategy uses available information and forecasting techniques to seek a better performance than a portfolio that is simply merge in single investment.
4. Diversification is means of reducing security risk simply by holding combination of securities which have correlation among each other.
5. A strategy of hedging can be used to guard against unfavorable movements in the product price.

Part II Multiple choice questions

1. ----- is the use of the contracts to reduce risk.

A. Discounting	D. Combination
B. Diversifying	E. None of the above
C. Hedging	
2. -----Is /are/ factor affect global portfolio management.

A. Tax rate	D. Inflation rate
B. Interest rate	E. All except D
C. Exchange rate	
3. -----is the standardization of the futures contract facilitates the secondary market trading.

A. Forward	C. Option
B. Future contract	D. Swaps.
4. The portfolio management process has the following steps and the sub-components:

A. Planning	D. Feed back
B. Execution	E. All except C
C. Controlling	
5. ----- can be defined as the exchange of one stream of future cash flow with another stream of cash flows with different characteristics.

A. Swap	C. Future contract
B. Planning	D. Forward contract.

Part III Discussion questions

1. Discuss the process of portfolio management
2. What is the active portfolio management?

Answer key for self-test exercises

Chapter one

Part I: True or False

1. False
2. True
3. True
4. False
5. True

Part II: Multiple Choice

1. D
2. E
3. B
4. D
5. B

Part III: Discussion Question

1. Investment in any of the alternatives depends on the needs and requirements of the investor.
 - ✚ **Equity Shares:** Equity investments represent ownership in a running company. By ownership, we mean share in the profits and assets of the company but generally, there are no fixed returns.
 - ✚ **Debentures or Bonds:** Debentures or bonds are long term investment options with a fixed stream of cash flows depending on the quoted rate of interest.
 - ✚ **Money Market Instruments:** Money market instruments are just like the bonds but the time period is very less. It is generally less than 1 year.
 - ✚ **Mutual fund, real state, financial derivatives, Precious Objects, life insurance etc.**
2. Investment company benefits:
 - ✚ Economies of scale

- ✚ Way to spread your risk
- ✚ A professional manager's expertise
- ✚ A chance to invest small amounts

Chapter two

Part I: True or False

1. True
2. True
3. True
4. True
5. True

Part II: Multiple Choice

1. E
2. B
3. A
4. E
5. A

Part III: workout question

1. Solution: a) 1st year and 2nd year return is calculated as:

$$\begin{aligned} \text{1st yr TR} &= (\text{Ending Capital} / \text{Starting Capital}) - 1 = (1200/1000) - 1 \\ &= 20\% \end{aligned}$$

$$\begin{aligned} \text{2nd yr TR} &= (3300/2200) - 1 \\ &= 50\% \end{aligned}$$

- b) we could use the two annual returns to get the same result:

$$\text{Total Return} = (1 + 20\%) * (1 + 50\%) - 1 = 0.8 = 80\%$$

- c) Average Annual Return = $(20\% + 50\%) / 2 = 70\% / 2 = 35\%$

2. Expected return for stock A and B calculated as follows:

- $E[R]_{\text{Bharat}} = .3(16\%) + .5(11\%) + .2(6\%) = 11.5\%$
- $E[R]_{\text{oriental}} = .3(40\%) + .5(10\%) + .2(-20\%) = 13\%$,

$$\begin{aligned} 3. \sigma_{\text{Bharat}} &= 0.3(16-11.5)^2 + 0.5(11-11.5)^2 + 0.2(6-11.5)^2 = 12.25 \\ \sqrt{12.25} &= 3.5 \end{aligned}$$

$$\sigma_{\text{oriental}} = 0.3(40-13)^2 + 0.5(10-13)^2 + 0.2(-20-13)^2 = 441$$

$$\sqrt{441} = 21$$

∴-oriental is best based on return

But the Bharat is best based on risk

Chapter three

Part I: True or False

1. True
2. True
3. True
4. True
5. True

Part II: Multiple Choice

1. B
2. E
3. D
4. A
5. A

Part III: Discussion questions

1. A bond is basically a loan issued by a corporation or government entity. The issuer pays the bondholder a specified amount of interest for a specified time, usually several years, and then repays the bondholder the face amount of the bond.
2. Callable bonds, some corporate bonds are issued with call provisions, allowing the issuer to repurchase the bond at a specified call price before the maturity date.

Part IV: Workout questions

1. Yield to call $105 = \sum_{t=1}^5 \frac{14}{(1+r)^t} + \frac{114}{(1+r)^5} = 14.61\%$
2. Yield to maturity $105 = \sum_{t=1}^{15} \frac{14}{(1+r)^t} + \frac{100}{(1+r)^{15}} = 13.22\%$

Chapter four

Part I: True or False

6. True

7. True
8. True
9. True
10. True

Part II: Multiple Choice

1. D
2. A
3. B
4. C
5. D

Part IV: Workout questions

1. $V_0 = \frac{D_1}{k-g}$ $D_1 = D_0(1+g) = 3(1+0.08) = 3.24 = \frac{3.24}{0.14-0.08} = 54$
2. $P_0 = \frac{10(1+0.05)}{0.15-0.05} = 105$
3. $P_0 = \frac{10}{(1+0.1)} + \frac{10}{(1+0.1)^2} + \frac{10}{(1+0.1)^3} + \frac{120}{(1+0.1)^3} = 138.32$

Chapter five

Part I: Multiple Choice

1. C
2. E
3. F
4. D
5. E

Part II: fill in the blank space

1. Industry
2. Gross Domestic Product (GDP)
3. Risk avoiders:
4. Technical
5. Technical analysis and Fundamental analysis

Chapter six

Part I: True or False

1. True
2. False
3. False
4. False
5. False

Part II: Multiple Choice

1. B
2. A
3. B
4. C
5. D

Part III: Workout questions

1.

$$E(R_p) = 0.60(10\%) + 0.40(15\%) = 12\%$$

$$\text{i. Expected } \sigma = (0.6)^2 (3\%)^2 + (0.4)^2 (5\%)^2 + 2(0.6)(0.4)(3\%)(5\%)(1.00) = 0.001444$$

$$\sqrt{0.001444} = 0.038$$

$$\text{ii. Expected } \sigma = (0.6)^2 (3\%)^2 + (0.4)^2 (5\%)^2 + 2(0.6)(0.4)(3\%)(5\%)(0.25) = 0.000904$$

$$\sqrt{0.000904} = 0.030066593$$

$$\text{iii. Expected } \sigma = (0.6)^2 (3\%)^2 + (0.4)^2 (5\%)^2 + 2(0.6)(0.4)(3\%)(5\%)(0.00) = 0.000724$$

$$\sqrt{0.000724} = 0.026907248$$

$$\text{iv. Expected } \sigma = (0.6)^2 (3\%)^2 + (0.4)^2 (5\%)^2 + 2(0.6)(0.4)(3\%)(5\%)(-0.25) = 0.000544$$

$$\sqrt{0.000544} = 0.023323808$$

$$\text{v. Expected } \sigma = (0.6)^2 (3\%)^2 + (0.4)^2 (5\%)^2 + 2(0.6)(0.4)(3\%)(5\%)(-1.00) = 0.000004$$

$$\sqrt{0.000004} = 0.002$$

2.

1. Weight of stock X=

$$\frac{(0.15 - 0.05)20^2 - (0.1 - 0.05)50 * 20 * -0.2}{(0.15 - 0.05)20^2 + (0.1 - 0.05)50^2 - ((0.15 - 0.05) + (0.1 - 0.05)50 * 20 * -0.2)}$$

= 0.256410256 ~ 0.256

Weight of stock M = 1-0.256410256= 0.743589744 ~ 0.744

$$\text{Expected return} = 0.256(15\%) + 0.744(10\%) = 0.1128$$

$$\text{Expected } \sigma = (0.256)^2 (50\%)^2 + (0.744)^2 (20\%)^2 + 2(0.256)(0.744)(50\%)(20\%)(-0.2) = 309.0688$$

$$\sqrt{309.0688} = 17.58035267\%$$

$$2. \text{ Slope of CAL at optimal} = \frac{0.1128 - 0.05}{0.1758} = 0.357$$

3. The composition =

Weight of risk-free asset _____ 77.78%

Weight in stock X $0.256 * 0.2222 = 0.05688$

Weight of stock M $0.744 * 0.2222 = 0.16532$

Chapter seven

Part I: True or False

1. False
2. False
3. False
4. True
5. True

Part II: Multiple Choice

1. C
2. E
3. B
4. E
5. A

Part III: Discussion questions

1. Portfolio management process is an on-going way of managing a client's portfolio of assets. There are various components and sub-components of the process that

ensure a portfolio is tailored to meet the client's investment objectives well within his constraints.

2. Active portfolio management strategies respond much more to changing expectations. They aim to benefit from the differences between the beliefs of a portfolio manager concerning the valuations and those of the marketplace. Active portfolio management focuses on outperforming the market compared to specific bench mark, while passive port portfolio management aims to mimic the investment holding f a particular risk.

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Name Center.....

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Program..... Date

Assignment for investment analysis and portfolio management (AcFn 3201)

- This assignment is to be completed and send to the institute for evaluation. Its maximum load is **30%**.
- Do not try to complete the assignment until you have covered all the lessons and have reviewed the study guide and your self-test exercises.
- In addition to this, your tutor will clarify the assignment for you.
- After successfully completing this assignment, be certain that to write your **Name, ID No., Term and Center** on the cover page of your assignment and also your **Name and ID No.** on the other pages.



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Part I: True or false questions

Write “True” if the statement is correct and “False” if the statement is incorrect.

1. An investor is someone who seeks to buy and sell in order to take advantage of market price fluctuations.
2. A debenture bond is a bond denominated in a currency other than that of the country in which it is issued.
3. Initial public offering is stocks issued by a formerly privately owned company selling stock to the public for the first time.
4. Industry analysis is a technical analysis and a market strategy tool used by businesses to determine if they want to enter a product or service market.
5. When the economy is recession, the industries and companies in general said to be prosperous, since the performance of a company depends much on the performance of the economy
6. Capital asset pricing model (CAPM) is a theory concerned with the deriving the expected or required rates of return on risky assets based on the asset's unsystematic risk level.
7. Capital allocation line is a plot of risk-return combinations available by varying portfolio allocation between a risk-free asset and a risky portfolio.
8. Unique risk is a risk that can be eliminated by diversification.



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Part II: Multiple choices questions

Choose the correct answer and write down the answer on the answer sheet provided

1. Which one of the following is true about the relationship between risk and return?
 - A. Investors increase their required rates of return as perceived risk increases.
 - B. Investors decrease their required rates of return as perceived risk increases.
 - C. Investors increase their required rates of return as perceived risk decreases.
 - D. All of the above
2. The following is not a reason for investing
 - A. To provide for retirement.
 - B. To fund higher levels of current consumption.
 - C. To fund higher levels of future consumption.
 - D. To fund children's education needs.
 - E. To save up for a down payment on a house.
3. What role can stock exchange play in the economy?
 - A. It helps the business firms to raise capital by issuing shares and bonds
 - B. It helps for mobilizing of savings for investment
 - C. Creating investment opportunities for small investors
 - D. It helps the government to raise capital for development projects
 - E. It can help as an indicator of the economy
 - F. All of the above
4. Which one of the following is true about the fixed income securities?
 - A. Fixed income securities are promise to pay fixed return only



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- B. Fixed-income securities are debt obligations
 - C. They are only issued by corporations.
 - D. All of the above
 - E. None of the above
5. One of the following is **not** true about the characteristics of bonds?
- A. The coupon of a bond indicates the income that investor will receive over the life of the issue.
 - B. Maturity of the bond can state as term or serial bond.
 - C. Bonds can be issued on collateral basis only.
 - D. Bonds can be issued as bearer bond and registered bond
 - E. None of the above
6. Which one of the following statements is true about the interest rate and bond price?
- A. Other things remain constant; increasing the maturity of a straight bond will increase its sensitivity to interest rate changes.
 - B. Other things remain constant; increasing the coupon rate of a straight bond will increase its sensitivity to interest rate changes.
 - C. Other things remain constant; increasing the maturity of a straight bond will decrease its sensitivity to interest rate changes.
 - D. A&C
 - E. B&C
7. The balance sheet method states about value of the company that: -
- A. Value of the company only consider from accounting in the books of accounts.
 - B. Book value means the net worth of the company



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- C. Entirely depend on the market value and it compares with intrinsic value to know value of the company.
 - D. A & B
 - E. A & C
8. What is the effect of inflation on the performance of companies?
- A. Higher rates of inflation upset business plan
 - B. Reduce purchasing power in the hands of consumers
 - C. Increase the demand for the product of the company
 - D. All of the above
 - E. None of the above
9. Which one the following statement is correct about the portfolio management process?
- A. The portfolio management process is a continuous process and it never stops.
 - B. The last step in the portfolio management process is constructing policy statement.
 - C. Constructing portfolio is one steps of portfolio management process.
 - D. All of the above
 - E. None of the above
10. The investor should analyze company as:
- A. Cross sectional analysis
 - B. Time series analysis
 - C. Company performance in comparison to earlier years
 - D. Company performance in comparison to similar company



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- E. All of the above
- F. None of the above

Part III: discussion

1. Discuss in detail the investment alternatives
2. List and discuss the risks that can be faced on investment of bonds
3. Discuss the relationship between Economic, Industry & Company Analysis.
4. What is the contribution of one analysis to another?
5. Discuss the difference & Similarities between Fundamental Analysis & Technical Analysis.

Part IV: Work out Questions:

Please show all the necessary computation and steps clearly.

1. The expected rate of return and possibilities of their occurrence for **Stock A** and **Stock B** are given below;

	Stock A		Stock B	
Year	Return (%)	Probability (%)	Return (%)	Probability (%)
1	20	10	-20	15
2	-10	15	50	35
3	30	25	20	25
4	70	10	10	15



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Required:

- i. Calculate the expected return and standard deviation for stock A and Stock B
 - ii. On the basis of expected return and risk, which stock is preferable and why?
2. What amount should an investor be willing to pay for a Br 10,000, 10 year bond which pays 8% coupon and the investors required rate of return is 10%, if
 - A. Coupon is paid annually
 - B. Coupon is paid quarterly
3. The Dashen bank share company paid a Br. 3.50 dividend per share at the end of the year. The dividend is expected to grow by 8 percent each year for the next 3 years, and the stock's market price per share is expected to be Br.75 at the end of the third year. Investor requires a rate of returns of 10 percent. At what price per share should the Dashen bank share company stock sell?
4. A universe of securities includes a risky stock (The data for the universe are: X), a stock index fund (M), and T-bills.

	Expected return	σ
X	20%	40
M	15	15
T-bills	10	0

The correlation coefficient between X and M is 0.2.

- i. Find the optimal risky portfolio (O) and its expected return and standard deviation.
 - ii. Find the slope of the CAL generated by T-bills and portfolio O.



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iii. Suppose an investor places $\frac{2}{5}$ of the complete portfolio in the risky portfolio O and the remainder in T-bills. Calculate the composition of the complete portfolio.

5. Suppose there is an investor who owns three stocks.

Stocks	Stock value	E(ri)
A	Br. 25,000	18 %
B	15,000	12
C	10,000	10

What is the expected return the portfolio?

6. A portfolio which value Birr 2000 consist Birr 1000 of stock A and Birr 1000 stock B with standard deviation of 20% and 10%, respectively.

Required: calculate the portfolio risk if the covariance of the portfolio asset is -0.18

7. Find the beta on a stock given that its expected return is 20%, the risk-free rate is 6%, and the expected return on the market portfolio is 8%.