UNIT 6 VALUATION OF SECURITIES

6.1 INTRODUCTION

Valuation is the process that links risk and return to determine the worth of an asset. It can be applied to expected benefits from real/physical as well as financial to determine their worth at a given point of time. We will focus on valuation of two financial assets, namely, bonds/debentures and shares. The key inputs to valuation process are i) expected returns in terms of cash flows together with their timing and ii) risk in terms of the required return.

The value of an asset depends on the return (cash flow) it is expected to provide over the holding / ownership period. The cash flow stream can be (1) annual, (2) intermittent and (3) even onetime. In addition to total cash flow estimates, their timing/pattern (e.g. amount year-wise) is also required to identify the return expected from the bond/share. The required return is used in the valuation process to incorporate risk into the analysis. Risk denotes the chance that an expected cash flow would not be realized. The level of risk associated with a expected cash flow/return has a significant bearing on its value, that is, the greater the risk, the lower the value and vice versa. Higher risk can be incorporated into the valuation analysis by using a higher capitalization/ discount rate to determine the present value.

6.2 LEARNING OBJECTIVES

After reading this unit, you should be able to

- Understand the main characteristics of fixed income instruments.
- Discuss the time value concept.
- Describe basic discounted cash flow valuation model and its application to bonds.
- Learn valuations of equity instruments.
- Discuss their interpretation and applicability of valuation in the stock market.
- Compute and analyse share valuation through the most often used methods such as earnings valuation, cash flow valuation, book valuation and dividend valuation.

6.3 BOND: INTRODUCTION AND MEANING

Bonds are an important source of funds for the companies, government, municipality, public sector organizations who raise funds to finance variety of projects and activities. The position of a bond holder is totally different with that of an equity-holder. Whereas the former is creditor or we can say the partial lender to company the latter is the ultimate owner of the company. Although bond holders assume risk but that is much lower than the equity holders in the same organization. Bond investor also does not share in the growth of a company. If at some time company is not in a position to pay the interest to the bond holder in that case he has the right to sell the assets of the company and recover his principal. Another difference is that bonds usually have a defined term, or maturity, after which the bond is redeemed; whereas stocks may be outstanding indefinitely Bonds are the debt instruments bearing interest on maturity. In simple terms, organizations may borrow funds by issuing debt securities named bonds, having a fixed maturity period (more than one year) and pay a specified rate of interest (coupon rate) on the principal amount to the holders. Bonds have a maturity period of more than one year which differentiates it from other debt securities like commercial papers, treasury bills and other money market instruments.

6.4 BOND TERMINOLOGY

Coupon The periodic interest payment made by the issuer. When bonds were first developed, the bond certificate had detachable coupons that the investor would send to the issuer to receive each interest payment. The term still applies to payments, even though coupons are no longer used to redeem them.

Coupon rate The interest rate used to calculate the coupon amount the bond will pay. This rate is multiplied by the face value of the bond to arrive at the coupon amount.

Face (par) value The amount printed on the certificate. The face value represents the principal in the loan agreement, which is the amount the issuer pays at maturity of the bond.

Maturity date The date the loan contract ends. At this time, the issuer pays the face value to the investor who owns the bond.

Bonds are often referred to as *fixed income securities* because they have a fixed payout to the investor. Since the coupon rate is set before the sale of the bond, the investor knows the amount of the interest payments.

6.5 PROCESS FOR ISSUING BONDS

A simple example will illustrate the process for issuing bonds.

Example ABC Company needs capital to purchase a new piece of equipment for its operations. The company meets with financial advisors and investment bankers to discuss the possibilities of raising the necessary capital. They decide that a bond issue is the least expensive method for the company.

The process is as follows:

1. ABC Company sets the maturity date and face value of the bonds.

The bonds will have a maturity date of ten years from the date of issue and a face value of Rs.1,000. The company will issue as many bonds as it needs for the equipment purchase – if the equipment costs Rs.10,000,000 fully installed, then the company will issue10,000 bonds.

2. Investment bankers set the coupon rate for the bonds.

The investment bankers attempt to gauge the interest rate environment and set the coupon rate commensurate with other bonds with similar risk and maturity. The coupon rate dictates whether the bonds will be sold in the secondary market at facevalue or at a discount or premium. If the coupon rate is higher than the prevailing interest rate, the bonds will sell at a *premium*; if the coupon rate is lower than the prevailing interest rate, the bonds will sell at a *discount*.

3. Investment bankers find investors for the bonds and issue them in the primary market.

The investment bankers use their system of brokers and dealers to find investors to buy the bonds. When investment bankers complete the sale of the bonds to investors, they turn over the proceeds of the sale (less the fees for performing their services) to the company to use for the purchase of equipment. The total face value of the bonds appears as a liability on the company's balance sheet.

4. The bonds become available in the secondary market.

Once the bonds are sold in the primary market to investors, they become available for purchase or sale in the secondary market. These transactions usually take place between two investors – one investor who owns bonds that are no longer needed for his/her investment portfolio and another investor who needs those same bonds.

Bond structure

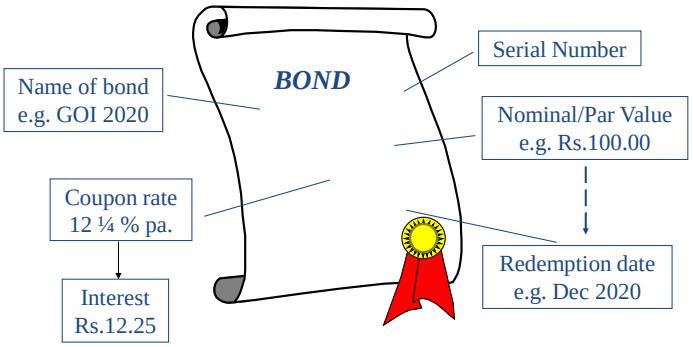


Fig 6.1 Bond Structure

6.6 VALUATION OF BONDS

1. Current Yield

Current Yield is a Bond Yield that is determined by dividing the fixed coupon amount (that is paid as a percentage on the face or original value of the specific bond) by the current price value of the particular bond. **In other words, Current Bond Yield = Coupon amount / current market price of a bond.**

For example:

The market price for a 8.24% G-Sec 2018 is Rs.118.85. The current yield on the security will be 0.0824 x 100 / 118.85 = 6.93 percent.

2. **Yield to Maturity** (YTM)

Yield to Maturity is the most popular measure of yield in the Debt Markets. YTM refers to the percentage rate of return paid on a bond, note or other fixed income security if the investor buys and holds the security till its maturity date.

The calculation for YTM is based on the coupon rate, the length of time to maturity and the market price of the bond. YTM is basically the Internal Rate of Return on the bond.

The yield or the return on the instrument is held till its maturity is known as the Yield-to maturity (YTM). Given a pre-specified set of cash flows and a price, the YTM of a bond is that rate which equates the discounted value of the future cash flows to the present price of the bond. It is the internal rate of return of the valuation equation. This is the most widely used yield calculation method.

Yield to maturity represents the yield on the bond, provided the bond is held to maturity and the intermittent coupons are re-invested at the same YTM rate. In other words, when we compute YTM as the rate that discounts all the cash flows from the bond, at the same YTM

rate, what we are assuming in effect is that each of these cash flows can be re-invested at the YTM rate for the period until maturity. The concept of Yield to maturity assumes that future cash flows are reinvested at the same rate at which the original investment was made.

Market price $\frac{I/2}{(1+r)}+\frac{I/2}{(1+r)^2}+\frac{I/2}{(1+r)^3}+\ldots\ldots\ldots\ldots\ldots\ldots\frac{\frac{I}{2}+FV}{(1+r)^n}$

Where;

I/2=annual interest ate payable half yearly

r=discount rate or YTM

n =number of half years remaining to maturity

The approximate Yield to maturity (YTM) can be computed as per the formula given below;

YTM=$\frac{I+(F-M)/N}{(F+M)/2}$

Where

I = Annual Interest Rate

F= face Value of bond

M= market price of the bond

N Number of years to Maturity

Suppose Ramesh bus 12% 7 year GOI-2007 at Rs 102 and Suresh buys the same instrument at Rs104 then the yield to maturity using approximation is;

For Ramesh

YTM=$\frac{12+(100-102)/7}{(100+102)/2}$ =11.59%

For Suresh,

YTM=$\frac{12+(100-104)/7}{(100+104)/2}$ =11.20%

3. Pricing of Bonds:

Pricing a bond involves finding the present value of the cash flows from the bond throughout its life. The formula for calculating the present value of a bond is:

V = C[1 / (1+R)]1+ C[1 / (1+R)]2+ ... + C[1 / (1+R)]T+ F[1 / (1+R)]T

Where:

V = Present value of the bond

C = Coupon payment (coupon rate multiplied by face value)

R = Discount rate (current prevailing rate)

F = Face value of the bond

T = Number of compounding periods until maturity

Example:

What is the present value of a bond with a two-year maturity date, a face value of Rs.1,000, and a coupon rate of 6%? The current prevailing rate for similar issues is 5%. To apply the formula,

C = Rs.60 (Rs.1,000 x 0.06), R = 0.05, T = 2, and F = Rs.1,000.

V = C[1 / (1+R)]1 + C[1 / (1+R)]2 + F[1 / (1+R)]2

V = Rs.60 [1 / (1+0.05)] + Rs. 60[1 / (1+0.05)]2 + Rs.1,000[1 / (1+0.05)]2

V = Rs.60 [0.95238] + Rs. 60[0.90703] + Rs.1,000 [0.90703]

V = Rs.57.14 + Rs.54.42 + Rs.907.03

V = Rs.1,018.59

The present value of Rs.1,018.59 is the price that the bond will trade for in the secondary bond market. You will notice that the price is higher than the face value of Rs.1,000. In the time since these bonds were issued, interest rates have fallen from 6% to 5%. Investors are willing to pay more for the Rs.60 interest payments when compared with new bond issues that are only paying Rs.50 in interest per Rs.1,000 face value.

This inverse relationship is important.

As interest rates fall, bond prices rise;

As interest rates rise, bond prices fall.

A bond with a coupon rate that is the same as the market rate sells for face value. A bond with a coupon rate that is higher than the prevailing interest rate sells at a premium to par value; a bond with a lower rate sells at a discount.

6.7 TYPES OF RISK IN BONDS INVESTMENT

Investor who invests in financial instruments must be aware of the risk associated with particular instruments and its impact on his assets and financial capacity. Investing in bonds involve the following risks.

Real Interest Rate Risk*:* Even is there is no inflation risk, borrowers and lenders are still exposed to the risk of change in the real interest rate. Shifts in supply and/or demand for funds will change the real rate of interest. To understand the implications of real interest rate risk consider an example. Suppose that the real interest rate falls from 6to4 percent because a

Combination of tax law changes and heightened competition drives down the real interest rate. In this case a firm that has borrowed funds at six percent real interest rate suffers. While is now earns only four percent on its assets, it has to pay six percent on its debt. Irrespective of whether it gains or losses from a change in the real rate of interest, a firm that has locked itself into a long-term debt at a fixed real cost can experience a dramatic impact whenever the real rate of interest changes. As such changes can scarcely be predicted, they represent a source of risk that borrowers and lenders have to face.

Default Risk**:** Default risk refers to the risk accruing from the fact that a borrower may not pay interest and / or principal on time. Other things being equal, bonds which carry a higher default risk (lower credit rating) trade at a higher yield to maturity. Put differently, they sell at a lower price compared to government securities which are considered free from default risk (as the government has the power to print money, it is believed that it will not default in honouring its commitments). Except in the case of highly risky debt instruments, referred to as junk bonds, investors seem to be more concerned with the perceived risk of default rather that the actual occurrence of default. Even though the actual default may be highly unlikely, they believe that a change in the perceived default risk of a bond would have an immediate impact on its market price.

Call Risk: A bond may have a call provision that gives the issuer the option to call the bond

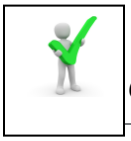
before its scheduled maturity. The issuer would generally exercise the call option when interest rates decline. While this is attractive from the issuer's point of view, it exposes the investors to call risk. Since bonds are typically called for prepayment after almost invariably have to accept a lower yield when they reinvest the amount received on premature redemption.

Liquidity Risk: Barring some of the popular Government of India securities which are traded

Actively, most debt instruments do not seem to have a very liquid market. The market for debt is mainly an over-the counter market and much of the activity seems to investors face difficulty in trading debt instruments, particularly when the quantity is large. They may have to accept a discount over the quoted price while selling and pay premium while buying. This seems to be a major problem in certain segments of debt market – far bigger than most investors realize.

Reinvestment Risk: When a bond pays periodic interest there is a risk that the interest payment may have to be reinvested at a lower interest rate. This is called *reinvestment risk*. There investment risk is greater for bonds with longer maturity and for bonds with higher interest payments.

Foreign Exchange Risk*:* If a bond has payments that are denominated in a foreign currency its rupee cash flows are uncertain. The risk that the foreign currency will depreciate in relation to the Indian rupee is referred to as the foreign exchange risk (or currency risk).



Check Your Progress-A

Q1. What is a bond?

Q2. What is the yield on a bond?

Q3. What is the difference between bond and debenture?

Q4. What are the reasons of issuing bonds?

Q5.How does an investor make money in bonds?

Q6 .What are the risks of bonds?

6.8 EQUITY VALUATION

Sai (Investor, aged 50 yrs): "I have Rs.20,000 with me. Instead of putting this money in my savings bank A/c where I get 3.5% p.a, I wish to invest into stock market. Can you suggest me a scrip which I can yield safe returns of say 5-6%?"

Investment advisor,: "As market has bottomed very drastically, I can suggest you plenty of blue chip scrips which are trading in the range of .4 to .6 of their book values with amazing P/E multiple of 2-4.They have good dividend track record too. If you consider average amount of dividend regularly paid by these companies, some of these companies carry a dividend yield of around 5-6%. This satisfies your criteria of safety and 5-6% yield. Say for ex. Allahabad Bank, a Govt. of India Enterprise. Its book value is Rs.134, EPS is Rs.17 and average dividend for last 6 years is 30%.Thus at current market price of mere Rs.37. Its P/BV is just .27and P/E is just 2.2 and mind blowing dividend yield of 8%.You must buy this stock''

Therefore from the above it can be inferred that valuation of equity is very important for an investor. Therefore, lets us now learn various techniques of valuing equity.

6.9 EQUITY VALUATION TECHNIQUES

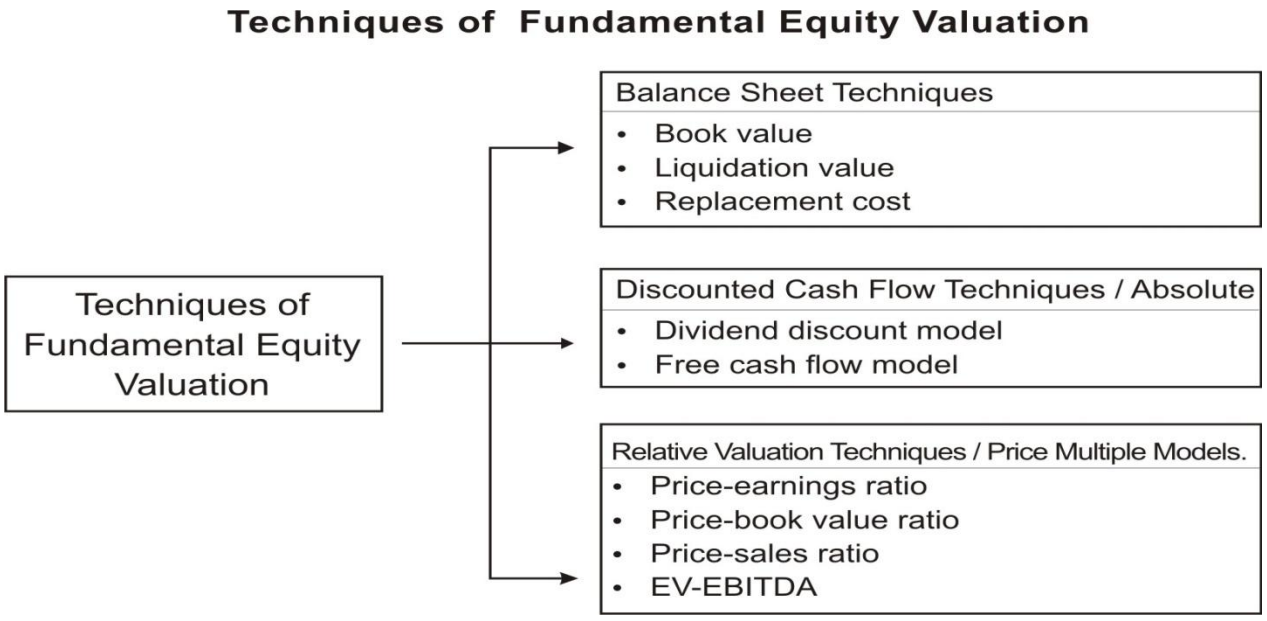


Fig 6.2 Techniques of Equity Valuation

Balance Sheet Techniques: Three measures derived from balance sheet are

1) **Book Value:** Book value is nothing but Net worth (Equity share capital plus reserve and surplus) of a company divided by total no. of outstanding equity shares. Thus this form of valuation is based on the books of a business, where owners' equity, is determined by a simple equation of total assets minus total liabilities and this is used to set a price. Companies whose stocks sell for less than book value are generally considered to be undervalued, or having less risk than companies selling for greater than book value. Because most companies sell for much more than book value, a company selling for less than book value may well have considerable upside potential. But the basic limitation of this value is that the book value doesn't reflect the true current economic value of the share. It also doesn't consider the future earnings potential of the company.

2) **Liquidation Value:** This approach is similar to the book valuation method, except that the liquidation value of assets are used instead of the book value of the assets. Using this approach, the liabilities of the business are deducted from the liquidation value of the assets to determine the liquidation value of the business. In simple words, The liquidation value of a company is equal to what remains after all assets have been sold and all liabilities have been paid. Liquidation value of an equity share is calculated by dividing liquidation value of the business by total no. of outstanding equity shares. Although it seems to be more realistic. The major problems in applying this method are - it is too difficult to estimate the liquidation value of the assets and secondly it doesn't consider the future earnings potential of the company. Thus it can be applied to dead companies rather than alive.

   For example – Valuation of a very sick textile company having a very huge land bank at prime locations. The share price of such company although making substantial losses can be much more than it's book value or say the share price of such company can be a positive although the book value is negative

3) **Replacement Cost:** Another theory related to equity valuation is that a firm cannot sell for much less or much more than the **replacement cost** of its assets less liabilities, which is quantified by the **Q ratio**, also known as **Tobin's Q**, because it was developed by James Tobin, who hypothesized that the total market value of all companies must be relatively equal to the replacement value of their assets minus their liabilities.

   For an individual company, the Q ratio is equal to the market price of the firm divided by its replacement cost.

Tobin's Q ratio Formula=Ratio of $\frac{Market\ Price\ of\ Firm}{Replacement\ cost}$

If individuals or companies want to enter a business, certainly it would be an important consideration whether they could buy a business for less than what it would take to replicate the company by starting from scratch, especially since bought out established company has revenue generation since day one.

If the Q ratio is significantly less than 1, then it would be cheaper for potential competitors to buy the firm rather than start a new business, so this would tend to increase its market price. If it is sold for significantly more than the Q ratio of 1, then competitors would enter the market, and drive down the price of the firm until it is approximately equal to 1.

As the replacement cost of a company would be difficult to ascertain quickly, the Q ratio cannot be a driving force in determining daily stock prices for companies. However, it could be an indicator for long-term trends and as a potential takeover target if the company's Q ratio is less than 1.

Discounted cash flow/Absolute Techniques: The value of an asset is the present value of the expected future cash flows from that asset, discounted at a rate appropriate to the level of risk of the cash flows. Just like that, to determine the value of an equity, one needs to know the future cash flow to equity.

What is the future cash flow to equity? It is either in the form of dividends or in the form of operating cash flow. Thus these techniques include dividend discount model and Free Cash Flow Model

1) **Dividend Discount Model :** When valuing a stock, dividends are the most clear-cut way of defining cash flows; they're actual cash flows that go directly to the investor. Therefore, the value of equity share under this model is equal to present value of future dividends plus present value of expected sale proceeds of equity share.

A) Single Period Valuation model – Let us begin with the case where the investor expects to hold the equity share for one year. The price of equity share will be

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

For ex. – 1) Allahabad Bank is expected to give 3 Rs. dividend and fetch a price of Rs.57 at the end of a year? What should be its present price if investor expects to have 20% rate of return?

So $P_0 = \frac{3}{(1.2)} + \frac{57}{(1.2)}$

= Rs.50

Ex. 2) Current forecasts for Arvind Mills are dividends payments of Rs 5.6, Rs2.5, and Rs 7over the next three years, respectively. At the end of three years you anticipate selling this stock at a market price of Rs 98.36. What should be the price of the stock given a 12% expected return?

$$PV = \frac{5.6}{(1+.12)^1} + \frac{2.5}{(1+.12)^2} + \frac{7.00+98.36}{(1+.12)^3}$$

$$P0 = Rs.82.00$$

B) Zero Growth Model: If dividend per share remains constant year after year, the value of equity share will be

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

$$\text{Zero Growth}: \; P_0 = \frac{\text{Div}}{r}$$

Where: P=the price at time 0

r=discount rate

For the sake of simplicity, consider a company with a Rs.2 annual dividend. If you figure the company will pay that dividend indefinitely, you must ask yourself what you are willing to pay for that company. Assume expected return, or, more appropriately in academic parlance, the 'required rate of return' is 5%. According to the dividend discount model, the company should be worth Rs.40.00 (Rs2 / .05).

B) Constant Growth Model (Gordon Model) : A model for determining the intrinsic value of a stock, based on a future series of dividends that has a current value of *D* and grows at a constant rate g in perpetuity. This model finds out the present value of the infinite series of future dividends which involves summing the infinite series which gives the value of current P.

This is known as the constant growth DDM or the Gordon Model after its creator, Myron Gordon. Let's take the same example. Here you assume one more fact that company's dividend will grow by 4% annually. The company's share value should then be Rs2 / (.05 - .04) = Rs 200.

Here is the formula for valuing a company with a constantly growing dividend, as well as the proof of the formula:

$$\text{Constant Growth: } P_0 = \frac{\text{Div}}{r-g}$$

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

Few examples of Gordon Model:

1) What is the value of a stock that expects to pay a Rs.4.00 dividend next year, and then increase the dividend at a rate of 8% per year, indefinitely? Assume a 12% expected return.

$$P_0 = \frac{Div_1}{r-g} = \frac{Rs.4.00}{.12-.08} = Rs.100$$

2) If the same stock is selling for Rs.200 in the stock market, what might the market be assuming about the growth in dividends?

$$Rs200 = \frac{Rs4.00}{.12-g}$$

$$g = .10$$

D) Two Stage Dividend Discount Model: This model assumes that dividends grow at one constant extraordinary rate during the first stage and then grow at a normal growth rate indefinitely. The valuation for such stock has got three steps 1) Present value of dividends in first stage 2) Present value of dividends in second stage (which is calculated based on Gordon Model) 3) The sum of these two values.

For ex.-- Consider X-pro Industries, According to an analyst, it is expected to pay Rs.1.16 annual dividend next year and is expected to grow 14% annually for the next four years subsequently. The analyst also expects the growth rate to stabilize at 7% thereafter. If an investor wants 10% rate of return. What should be the value of its equity share?

(Amount in Rs)

Year	Dividend	Growth	Present value
1	1.16		1.05
2	1.32	14%	1.09
3	1.51	14%	1.13
4	1.72	14%	1.17
5	1.96	14%	1.22
Perp	2.10	7%	

Perp value	70		43.46
			49.12

Thus the value should be 49.12. If it is more than that, it is overvalued and vice versa.

E) H Model : The Gordon growth model implicitly assumes that growth will be stable forever. However, many companies grow at a faster than normal rate before slowing to this stable condition. In such cases, investors can use a multi-stage dividend discount model wherein the Gordon growth model is used to estimate the value once the company matures, but where interim cash flows are estimated using some other method. One such method is the H-model.

The H-Model assumes that growth begins at some super-normal rate, then the growth rate declines in a linear fashion until it reaches the normal rate. Under the H-Model, Value = D0(1 + gt)/(r - gt) + D0H(gs - gt)/(r - gt).

The left side of the equation is the Gordon growth model discounted to the present from time t. gt is the growth rate at time t. gs is the current super growth rate and H is the half-life of the expected high growth period.

Consider a potential investment in X-pro Industries. It pays a current dividend of Rs.1.16 per share. Its growth rate over the last five years has been 36%. Analysts expect that growth will slow from 36% pace to the 7% rate linearly over the course of next 10 years and will stabilize indefinitely. If an investor with a 10% required return wants to invest in X- pro, how much would that investor be willing to pay for a share today?

Using the H-Model, Value = 1.16(1.07)/(0.10 - 0.07) + (1.16 * 5)(0.36 - 0.07)/(0.10 - 0.07)

Value =1.24/0.03 + (5.80 * 0.29)/0.03 = 41.37 + 56.06 = Rs 97.43.

F) Three Stage Dividend Discount Model: This has an initial phase of stable high growth that lasts for a certain period. In the second phase the growth rate declines linearly until it reaches the final stable growth rate. This model improves upon both previous models and can be applied to nearly all firms.

For Ex. Analysts expect that X- pro Ind. is expected to declare dividend of Rs.**1.16 next year** and is expected to **grow at 14% p.a. for four years thereafter**. After 5 years the growth rate will slow from 14% pace to the 7% rate linearly over the course of 10 years and will stabilize at 7% thereafter. . If an investor with a 10% required return wants to invest in X- pro, how much would that investor be willing to pay for a share today?

First of all, we need to calculate the present value of the dividends for next five years-

Year	Dividend	PV
1	1.16	1.05
2	1.32	1.09
3	1.51	1.13
4	1.72	1.17
5	1.96	1.22
Rs. 5.67		

At the end of 5 years, the growth will slow at a linear rate for 10 years to a terminal growth rate of 7%.

The terminal value for second and third phase can be estimated using the two-stage H model = (1.96 * 1.07)/(0.10 - 0.07) + (1.96 * 5 * (0.14 - 0.07))/(0.10 - 0.07) = Rs.69.90 + Rs22.86 = **Rs.92.76**.

It is the value at the end of five years, so it must be discounted back to the present value @ 10%. The present value is thus Rs.92.76/1.10^5 =**Rs.57.60.**

Adding the present value of the terminal value to the present value of the dividends for first 5 years, we get, Rs. 57.60 +Rs.5.67 = Rs.63.27 (the value of a share)

G) ***Multistage Dividend Discount Model*** **:**An equity valuation model that builds on the Gordon growth model by applying varying growth rates to the calculation. Under the multistage model, changing growth rates are applied to different time periods. Various versions of the multistage model exist including the two-stage, H, and three-stage models.

The two-stage model has an unstable initial growth rate, and can be either positive or negative. This initial phase lasts for a specified time and is followed by stable growth which lasts forever. The problem with this model is that the growth rate from the initial phase is assumed to change to the stable growth rate overnight.

The H-model has an initial growth rate that is already high, which then declines to a stable growth rate in a linear fashion over time.

Finally the three-stage model has an initial phase of stable high growth that lasts for a certain period. In the second phase the growth rate declines linearly until it reaches the a final stable growth rate. This model improves upon both previous models and can be applied to nearly all firms.

2) The FCFE Discount Model : Akin to the dividend discount model, with a significant change – FCFE replaces dividend in the models.The FCFE is a measure of what a firm can afford to pay out as dividends. Dividends paid are different from the FCFE for a number of reasons --

- Desire for Stability
- Future Investment Needs
- Tax Factors
- Signalling Prerogatives

A) **The Constant Growth FCFE Model:** The value of equity, under the constant growth model, is a function of the expected FCFE in the next period, the stable growth rate and the required rate of return.

$$P_0=\frac{FCFE_1}{r-g_n}$$

where,

P_0= Value of stock today

FCFE1 = Expected FCFE next year

r = Cost of equity of the firm

g_n= Growth rate in FCFE for the firm forever

B) **The Two-stage FCFE Model** :Like two stage dividend discount model, the value of any stock, here is the present value of the FCFE per year for the extraordinary growth period plus the present value of the terminal price at the end of the period.

Value = PV of FCFE + PV of terminal price

C) The Three-stage FCFE Model : It is like three stage dividend discount model where the investor expects a high growth period initially then linear downtrend known as transition period and the last phase is called the infinite stable growth period.

Relative Valuation Techniques: In relative valuation, we value an asset based upon how similar assets are priced. A prospective house buyer decides how much to pay for a house by looking at the prices paid for similar houses in the neighbourhood. Thus these techniques determine the share prices based upon shares of the similar companies in the same industry.

Relative valuation is much more likely to reflect the current mood of the market, since it attempts to measure relative. Thus, in a market where all internet stocks see their prices bid up, relative valuation is likely to yield higher values for these stocks than discounted cash flow valuations. In fact, by definition, relative valuations generally yield values that are

closer to market prices than discounted cash flow valuations, across all stocks. This is particularly important for those investors whose job it is to make judgments on relative value and who are themselves judged on a relative basis. Consider, for instance, managers of technology mutual funds. These managers will be judged based upon how their funds do relative to other technology funds. Consequently, they will be rewarded if they pick technology stocks that are undervalued relative to other technology stocks, even if the entire sector is overvalued.

The strengths of relative valuation are also its weaknesses. First, the ease with which a relative valuation can be put together, pulling together a multiple and a group of comparable firms, can also result in inconsistent estimates of value where key variables such as risk, growth or cash flow potential are ignored. Second, the fact that multiples reflect the market mood also implies that using relative valuation to estimate the value of an asset can result in values that are too high, when the market is over valuing comparable firms, or too low, when it is under valuing these firms. Third, while there is scope for bias in any type of valuation, the lack of transparency regarding the underlying assumptions in relative valuations makes them particularly vulnerable to manipulation. A biased analyst who is allowed to choose the multiple on which the valuation is based and to choose the comparable firms can essentially ensure that almost any value can be justified.

1) P/E Ratio (Earnings Multiplier Approach): A valuation ratio of a company's current share price compared to its per-share earnings.

Calculated as:

P/E Ratio = Market value per share / Earnings Per Share

For example, if a company is currently trading at Rs.50 a share and earnings over the last 12 months were 10 per share, the P/E ratio for the stock would be 5 (50/10).

EPS is usually from the last four quarters (trailing P/E), but sometimes (for predicting the future value of the stock), it can be taken from the estimates of earnings expected in the next four quarters. A third variation uses the sum of the last two actual quarters and the estimates of the next two quarters.The value of a stock under this approach is estimated as follows,

P0 = E1 * P0/E1

Where P0 is the estimated value, E1 is the estimated earnings per share, and P0/E1 is the justified P/E Ratio

2) Price To Book Value Ratio (P/BV Ratio) : A ratio used to compare a stock's market value to its book value. It is calculated by dividing the current closing price of the stock by the latest quarter's book value per share. Also known as the "price-equity ratio".It is calculated as;

$$\text{PBV ratio} = \frac{\text{Market price per share at time } t}{\text{Book value per share at time } t}$$

A lower P/B ratio could mean that the stock is undervalued. However, it could also mean that something is fundamentally wrong with the company. As with most ratios, this varies from industry to industry for ex. This ratio is much lower in case of banking stocks as compared to technology (software) sector. This ratio also gives some idea of whether the investor is paying too much for what would be left if the company goes bankrupt immediately.

3) **Price-To-Sales Ratio:** A ratio for valuing a stock relative to its own past performance, other companies or the market itself. Price to sales is calculated by dividing a stock's current price by its revenue per share for the trailing 12 months:

$$\text{PSR}=\frac{Share\ Price}{Revenue\ per\ share}$$

Let's consider how we evaluate a firm that has not made any money in the past year. Unless the firm is going out of business, the price-to-sales ratio will show if the firm's shares are valued at a discount against others in its sector. Say the company has a price-to-sales ratio of 0.5 while its peers have higher ratios of, say, 2.5. If the company can turn things around, its shares will enjoy substantial upside as the price-to-sales ratio becomes more closely matched with those of its peers. Meanwhile, a company that goes into a loss (negative earnings) may lose also its dividend yield. In this case, price-to-sales represents one of the last remaining measures for valuing the business. All things being equal, a low price-to-sales ratio is good news for investors, and a very high price-to-sales ratio can be a warning sign.

The price-to-sales ratio can vary substantially across industries; therefore, it's useful mainly when comparing similar companies. Because it doesn't take any expenses or debt into account, since the numerator, the price of equity, takes a firm's leverage into account, whereas the denominator, sales, does not. Comparing P/S ratios carries the implicit assumption that all firms in the comparison have an identical capital structure. This is always a problematic assumption, but even more so when the assumption is made between industries, since industries often have vastly different typical capital structures (for example, a utility vs. a technology company). This is the reason why P/S ratios across industries vary widely.

4) Enterprise value to EBITDA (EBITDA Multiple): A ratio used to determine the value of a company. The enterprise multiple looks at a firm as a potential acquirer would, because it takes debt into account - an item which other multiples like the P/E ratio do not include. Enterprise multiple is calculated as:

$$\text{Enterprise Multiple} = \frac{Enterprise\ Value}{EBITDA}$$

Also known as the EBITDA Multiple.

A low ratio indicates that a company might be undervalued. The enterprise multiple is used for several reasons;

1) It's useful for transnational comparisons because it ignores the distorting effects of individual countries' taxation policies.
2) It's used to find attractive takeover candidates. Enterprise value is a better metric than market cap for takeovers. It takes into account the debt which the acquirer will have to assume. Therefore, a company with a low enterprise multiple can be viewed as a good takeover candidate.
3) The enterprise multiples can vary depending on the industry. Therefore, it's important to compare the multiple to other companies or to the industry in general. One can expect higher enterprise multiples in high growth industries (like biotech) and vice versa.

Quantitative Analysis – Value Added Concept: When the firms are in expansion phase and want to raise the capital for their business, it is necessary for the investor to know how their investment would fetch the returns. Following are some of the important methods which assist the investor for the same.

Economic Value Added – EVA : A measure of a company's financial performance based on the residual wealth calculated by deducting cost of capital from its operating profit (adjusted for taxes on a cash basis). (Also referred as "economic profit".)

The formula for calculating EVA is as follows:

= Net Operating Profit After Taxes (NOPAT) - (Capital * Cost of Capital)

Market Value Added - MVA : A calculation that shows the difference between the market value of a company and the capital contributed by investors (both bondholders and shareholders). In other words, it is the sum of all capital claims held against the company plus the market value of debt and equity.

The higher the MVA, the better for the investor. A high MVA indicates the company has created substantial wealth for the shareholders. A negative MVA means that the value of

management's actions and investments are less than the value of the capital contributed to the company by the capital market (or that wealth and value have been destroyed).

6.10 SUMMARY

Valuation is the process that links risk and return to determine the worth of an asset. It can be applied to expected benefits from real/physical as well as financial to determine their worth at a given point of time. The key inputs to valuation process are i) expected returns in terms of cash flows together with their timing and ii) risk in terms of the required return. Bonds, do have risk. Changes that occur in the market interest rate affect the value of the bond. It is known as interest rate risk. Other than this, there are default risk, marketability risk and call ability risk.

Bonds refer to debt instruments bearing interest on maturity. In simple terms, organizations may borrow funds by issuing debt securities named bonds, having a fixed maturity period (more than one year) and pay a specified rate of interest (coupon rate) on the principal amount to the holders. Bonds have a maturity period of more than one year which differentiates it from other debt securities like commercial papers, treasury bills and other money market instruments.

Yield to maturity is the single discount factor that makes the present value of future cash flows from a bond equal to current price of the bond. Bond value theorem states that market price affects the yield and vice versa.

Equity shares carry with them ownership rights. They give voting rights to the holders. They have a face value (in monetary terms) at the time of issue and are evaluated at their market value when they are listed on a stock exchange. Equity valuation is a complex procedure since there is no consistent definition regarding what constitutes the intrinsic value of a share. Different valuation approaches and models with different assumptions and implications are available to investors to assess the true worth of a share. These include earnings approach, cash flow approach and dividend discount approach. An investor can choose the appropriate procedure of valuation for shares and make profits from the stock market.

6.11 GLOSSARY

Par Value: Par Value is the value stated on the face of the bond. Coupon Rate and Interest bond carries a specific interest rate which is called the coupon rate.

Time value of Money: Time value concept of money is that the rupee received today is more valuable than a rupee received tomorrow.

Yield to Maturity (YTM): Yield to Maturity is the rate of return, which an investor can expect to earn if the bond is held till maturity.

ZCBs: Zero Coupon Bonds do not carry any coupon rate but are issued at a price discounted to the face value.

Share valuation: Share valuation is the process of assigning a value to a specific share. Price/Earnings (P/E) ratio relates the market price of a share with its earnings per share. Free cash flows are computed as cash from operations less capital expenditures.

6.12 REFERENCES

- Khan, M.Y. and Jain, P.K.,(1992), Financial Management Text and Problems., Secongd Edition, Tata McGraw Hill Publishing Company Limited, New Delhi
- Pandey, I.M. (2010), Financial Management, Tenth Edition, Vikas Publishing House Pvt. Ltd., New Delhi.
- "Prasanna Chandra (2006), Projects-Planning Analysis, Selection, Financing, Implementation and Review, 6th edition
- Sristava Rajiv and Mishra Anil (2016), Financial Management, Oxford University Press, New Delhi
- V .A Avadhani (2012). Securities Analysis and Portfolio Management, Himalaya Publishing House Pvt. Ltd.
- V.K Bhalla (2011).Investment Management,Security analysis and portfolio management :S.Chand & Company Ltd.
- Van Horne, James C. and Wachowicz, John M. Jr (2009), Fundamentals of Financial Management, 13th edition, Pearson Education Limited.

6.13 SUGGESTED READINGS

1. Basic Financial Management: M.Y. Khan and P.K. Jain, New Delhi, TMH 2000.
2. Financial Management: I.M. Pandey.
3. Financial Management: Theory and Practices- Prasanna Chandra.
4. Financial Management: Khan and Jain.

5. Corporate Financial Management: Arnold Alen, London, Pitman 1998.

6. Corporate financial management: Emery Douglas R, Pearson Education Asia, 1997.

7. Indian corporate financial management: Vijay Gopalan E., Bombay: Himalaya, 1997.

6.14 TERMINAL QUESTIONS

Q1. Discuss various risks in bond investment.

Q2. Explain various types of bonds.

Q3. Discuss the merits and limitations of the dividend discount model to valuation.

Q4. Discuss the merits and limitations of the dividend discount model to valuation.

Q5. A firm has issued 10%, 10 year bond with a Rs, 1000 par value, that pays interest annually, Compute the value of bond.

(Ans1000)

Q6. The bonds of the Premier Company Ltd (PCL) are currently selling at Rs.10, 800. Assuming (i) coupon rate of interest, 10 per cent, (ii) par value, Rs 10,000, (iii) maturity 10 years and (iv) annual interest payment, compute the YTM.

(Ans8.77%)