
UNIT 6: VALUATION OF BONDS, PREFERENCE AND COMMON STOCK

Content

- 6.0 Aims and Objectives
- 6.1 Introduction
- 6.2 The Valuation Process
- 6.3 The General Valuations Frame Work
- 6.4 Value Price Relationship
- 6.5 Valuation of Bonds
- 6.6 Valuations of Preference Shares
- 6.7 Valuations of Common Shares
- 6.8 Summary
- 6.9 Answers to Check Your Progress
- 6.10 Model Examination Questions
- 6.11 References

6.0 AIMS AND OBJECTIVES

This unit aims at presenting the meanings of security, types and their calculator.

After studying this unit, you will be able to:

- explain the types of securities
- calculate the value of bonds, preference stock and common stock
- identify the various methods of calculating securities

6.1 INTRODUCTION

You are aware that risk and return go together. If the risk is high returns will also be high, and low risk followed by low return. There is no conception of risk without at the same time considering return and vice-versa. In fact risk would be defined in terms of volatility or variability of return.

There could be various behind investing money by small investors to acquisitions for prestige and control, an average decision is founded on a buy-sell strategy with the expected holding period return in the foreground.

It must be noted that all classes of investors are interested in knowing the values of securities i.e. common stock, preference stock and bonds. They plan to hold them for periods ranging from short to infinity. Since, the investor belongs to special class of goner buyers and sellers, he would be influenced in his decision to buy/sell by two sets of values. One his own value and two the value externally determined by the market and known as price. These are the determinants of the buy – sell decisions of any goods or services in general. It is important to weigh. The risk and return, which affect the valuation, process both of the individual investor and the whole constellations of investors that constitute market.

Hence, the valuation is the key concept for investment decisions. No buy-sell action will take place without values.

6.2 THE VALUATION PROCESS

The basic valuation is a constant exercise is rationality with cost, benefits, and uncertainty as important variables. The valuation process will be examined in view of the performance of a firm in relation to the performance of industry to which it belongs; and the industry performance in turn, is linked to performance of the economy and the market is general. The three sequential steps in the valuations process would, therefore, be as follows:

- a) economy analysis
- b) industry analysis
- c) company analysis

6.3 THE GENERAL VALUATION FRAME WORK

Most investors look at price movements in security markets. They perceive opportunities of capital gains in such movements. All would wish if they could successfully predict them and ensure gains. Few, however, recognize that value determines price and both change randomly. It would be useful for an intelligent investor to be aware of this process.

The basic valuations model

Value of a security is a fundamental variable and depends on its promised return, risk and the discount rate. You may recall the basic understanding of present value concept, with the mention of fundamental factors like returns and discount rate. In fact the basic valuation model is none else than present value procedure. Given a risk adjusted discount rate and the future expected earnings flow of security in the form of interest, dividend, earnings, or cash flow, you can always determine the present value of follows.

$$PV = \frac{CF_1}{1+r} + \frac{CF_2}{(1+r)^2} + \frac{CF_3}{(1+r)^3} + \dots + \frac{CF_n}{(1+r)^n}$$

PV = Present value

CF = Cash flow interest, dividend, earnings per time period up to 'n' number of years

r = Risk adjusted discount rate

6.4 VALUE PRICE RELATIONSHIP

Present value also known as intrinsic value or economic value, determines the price. You have learned the role of buying and selling pressures which make prices move toward value.

The following are the valuation rules

1. Buy when value is more than price. This underlies the fact that shares are under priced and it would be a bargain to buy now and sell when prices move up toward value.
2. Sell when value is less than price. In a situation, like this, shares would be overpriced and it would be advantageous to sell them now and avoid loss when price later moves down to the level of the value.
3. Do not trade when value is equal to price. This is a state where the market price is in equilibrium and is not expected to change though suppose a share of an export company is currently traded at Birr 80 against face value of Birr 10

Now, the news of the company having lost a valuable export contract amounting to 40% of its expected total market sales of the coming year is gained by most active investors in the market. They revise the estimates of future income downward by 40% and risk

discount rate and other things remain same, rework the present value at Birr 48 (60% of 80 birr). Now you can apply rule 2 here.

Another example a company whose share was trading Birr 20 (par value Birr 10). Now the alert investor get the news of the lifting of a half-year long lock-out and signing of a three-year wage agreement quite beneficial to the management much before even the media could get it. Other things discount rate remain same, an analyst will revise their estimates of present value Birr 40

This will come under rule 1. Investors would expect price to move up toward the new value of Birr 40 and would immediately start buying at or around the current price of Birr 20.

6.5 VALUATION OF BONDS

A bond is an instrument or acknowledgement issued by a business unit or government the amount of loan, rate of interest and the terms of loan repayment. In order to value a bond you must understand the following.

Par value. It is the amount or value stated on the face of the bond. It represent the amount of the firm borrows and promises to repay at the time of maturity. It can be any denomination.

Coupon Rate of Interest. A bond carries a specific interest rate, which is called the coupon rate. The interest payable to the bondholder is simply par value of bond multiplied by the coupon rate.

Maturity period. Every bond will have maturity period. On completion of the maturity period the principal amount has to be repaid as per the agreed terms while issuing such bonds call provision. Some times bonds may be issued under a provision that the business unit will have an option to pay back the bond amount before the maturity period. These are known as callable bonds.

The intrinsic value of a bond is equal to the present value of its expected case flows. The coupon interest payments and principal payments are known and the present value is determined

by discounting these future payments from the issuer at an appropriate discount rate or market yield. The usual present value calculating are made with the help of the following equation.

$$PV = \sum_{t=1}^n \frac{C}{(1+r)^t} + \frac{TV}{(1+r)^n}$$

PV = Present value of the bond today

C = Coupon rate of interest

TV = Terminal value repayable

R = Appropriate discount rate or market yield

N = Number of years to maturity

Ex. A 10% bond of Birr 1,000 issued with a maturity of five years at par. The discounted rate of marketing 10%. The interest is paid annually. What would be the bond value.

$$\begin{aligned} PV &= \frac{100}{(1+.10)} + \frac{100}{(1+.10)^2} + \frac{100}{(1+.10)^3} + \frac{100}{(1+.10)^4} + \frac{100+1000}{(1+.10)^5} \\ &= 100 \times .9091 + 100 \times .8264 + 100 \times .7513 + 100 \times .6830 + 1100 \times .620 \\ &= 90.91 + 82.64 + 75.13 + 68.30 + 682.99 \\ &= \underline{999.97} \end{aligned}$$

Ex. A bond of Birr 1,000 at 6% is issued at par. The bond had a maturity period of five years. As of today five more years are left for final repayment at par. The current discount rate is 10 percent. What is the present value?

$$\begin{aligned} PV &= \frac{60}{(1+.10)} + \frac{60}{(1+.10)^2} + \frac{60}{(1+.10)^3} + \frac{60}{(1+.10)^4} + \frac{60+1000}{(1+.10)^5} \\ &= 60 \times .9091 + 60 \times .8264 + 60 \times .7513 + 60 \times .683 + 1060 \times .6209 \\ &= 54.55 + 45.08 + 40.98 + 658.15 \\ &= \underline{847.35} \end{aligned}$$

Relationship between coupon rate, required yield and price.

You are aware that yields change in market place, price of bonds change to reflect the new required yield. When the required yield on a bond rises above its coupon rate, the bond sells at a discount. When the required yield on a bond equals its coupon rate, the bond sells at par. When the required yield on a bond falls below its coupon rate, the bond sells at a premium.

Current yield:

The current yield relates the annual coupon interest to the market price. It is expressed as

$$\text{Current yield} = \frac{\text{Annual Interest}}{\text{Price}}$$

Ex. A Birr 1000 Bond issued at 12% at par for a period of ten years. Now the market price of the bond is Birr 950 what is the current yield of

$$\begin{aligned}\text{Current yield} &= \frac{\text{Annual interest}}{\text{Price}} \\ &= \frac{120}{950} \\ &= 0.1263 \\ &\text{or} \\ &\underline{12.63 \text{ percent.}}\end{aligned}$$

Yield to maturity

The yield to maturity (YTM) of a bond is the interest rate that makes the present value of the cash flows receivable from owning the bond equal to the price of the bond. Mathematically, it is the interest rate (r), which satisfies the equation.

$$P = \frac{C_1}{(1+r)} + \frac{C_2}{(1+r)^2} + \frac{C_3}{(1+r)^3} + \frac{C_n}{(1+r)^n} + \frac{TV}{(1+r)^n}$$

P = Price of the bond

C = Annual interest

M = maturity value

N = Number of years left to maturity

Any time the calculations of bond required the trial and error method to know the rate of interest which equates the price of bond.

Ex. A bond Birr 1000 is issued at par carrying coupon rate of interest of 9 percent. The bond matures after 8 years. The bond is currently selling for Birr 800. What is the YTM on this bond?

Given:

$$\begin{aligned}
 800 &= \frac{90}{(1+r)^t} + \frac{1000}{(1+r)^8} \\
 &= 90 (\text{PVFA}_r \text{ 8 years}) + 1000 (\text{PVF}_r \text{ 8 years})
 \end{aligned}$$

We have to begin with trial and error base.

Let us begin with discount rate of 12 percent.

$$\begin{aligned}
 &= 90 (\text{PVFA } 12 \text{ 8 years}) + 1000 (\text{PVF } 12 \text{ 8 years}) \\
 &= 90 (4.968) + 1000 (0.404) \\
 &= \underline{851.0}
 \end{aligned}$$

This is more than Birr 800 so we may have to try higher value of discount rate. Let us take 14 percent.

$$\begin{aligned}
 &= 90 (\text{PVFA } 14 \text{ 8 years}) + 1000 (\text{PVF } 14 \text{ 8 years}) \\
 &= 90 (4.639) + 1000 (0.351) \\
 &= \underline{768.1}
 \end{aligned}$$

The value is less than Birr 800, so let us try at 13 percent.

$$\begin{aligned}
 &= 90 (\text{PVFA } 13 \text{ 8 years}) + 1000 (\text{PVF } 13 \text{ 8 years}) \\
 &= 90 (4.800) + 1000 (0.376) \\
 &= \underline{808}
 \end{aligned}$$

Therefore, it lies between 13% and 14 percent.

$$\begin{aligned}
 &= 13 + \frac{808 - 800}{808 - 768.1} \times 1 \\
 &= 13 + \frac{8}{40} \\
 &= 13 + .2 \\
 &= \underline{13.2\%}
 \end{aligned}$$

Ex. An investor purchased a 15% Birr 500 fully paid bond five years back. The current market price of the bond is Birr 400. Calculate yield to maturity.

Let us begin with 15%

$$\begin{aligned}
&= 75 (\text{PVFA}_{15 \text{ 5 years}}) + 500 (\text{PVF}_{15 \text{ 5 years}}) \\
&= 75 (3.3522) + 500 (.4972) \\
&= 251.42 + 248.60 \\
&= \underline{500.08}
\end{aligned}$$

Since it is greater than 400 we will take 20%

$$\begin{aligned}
&= 75 (\text{PVFA}_{20 \text{ 5 years}}) + 500 (\text{PVF}_{20 \text{ 5 years}}) \\
&= 75 (2.9906) + 500 (.8333) \\
&= 224.295 + 200.95 \\
&= \underline{425.245}
\end{aligned}$$

Even this is greater than 400. Hence we take 24%

$$\begin{aligned}
&= 75 (\text{PVFA}_{24 \text{ 5 years}}) + 500 (\text{PVF}_{24 \text{ 5 years}}) \\
&= 75 (2.745) + 500 (.341) \\
&= 205.91 + 170.55 \\
&= \underline{376.46}
\end{aligned}$$

Hence, the YTM lies between 20 – 24

$$\begin{aligned}
&= 20 + \frac{425.24 - 400}{425.24 - 376.46} \times 4 \\
&= 20 + \frac{25.24}{48.785} \times 4 \\
&= 20 + 2.07\% \\
&= \underline{22.07\%}
\end{aligned}$$

Yield to call

As explained earlier is the same unit, some bonds carry a feature that entitles the issuer to call (buy back) the bond prior to the stated maturity date in accordance with a call schedule (which specifies a call price for early call date). For such bonds, it is a practice to calculate the yield to call (YTC) as well as the YTM.

$$P = \sum_{t=1}^n \frac{C}{(1+r)^t} + \frac{m}{(1+r)^n}$$

P = Price

C = Coupon rate of interest

m= maturity value ie call price

n= Number of years

The calculation of YTC is also same as YTM and we have to start with trial and error method.

6.6 VALUATION OF PREFERENCE SHARES

Preference shares are hybrid security. They have some features of bonds and some of equity shares.

Theoretically, preference shares are considered a perpetual security but there are convertible, callable, redeemable and other similar features, which enable issuers to terminate them within the finite time horizon.

Preference dividends are specified like bonds. This has to be done because they rank prior to equity shares for dividends. However, specifications doesn't imply obligation, failure to comply with which may amount to default several preference issues are cumulative where dividends accumulate over a period of time and equity dividends require clearance of preference arrears first.

Preference shares are less risky than equity because their dividends are fixed and all arrears must be paid before equity holders get their dividends. They are however, more risky than bonds because the latter enjoy priority in repayment and in liquidation. Bonds are secured also and enjoy protections of principal which is ordinarily not available to preference shares. Investor's required returns on preference shares are more than those on bonds but less than on equity shares.

Since dividends from preference shares are assumed to be perpetual payments, the intrinsic value of such shares will be estimated from the following equations.

$$V_p = \frac{C}{(1+k)} + \frac{C}{(1+k)^2} + \frac{Cn}{(1+k)^n}$$

V_p = Value of perpetual today

C = Constant dividends received

K = Required rate of return appropriate

$$\therefore V_{ps} = \frac{D}{K_{ps}}$$

Ex. A preference share of Birr 100 each with a specified dividend of Birr 11.5 per share. Now, if the investors' required rate of return corresponding to the risk level of a company is 10%, what would be the value of share today?

$$\begin{aligned} V_{ps} &= \frac{D}{K_{ps}} \\ &= \frac{11.5}{.10} \\ &= \underline{115.00} \end{aligned}$$

Should be required return increase to 12% what would be the value?

$$\begin{aligned} V_{ps} &= \frac{D}{K_{ps}} \\ &= \frac{11.50}{.12} \\ &= 95.83 \end{aligned}$$

If the market price of the preference share is Birr 125 what would be the yield?

$$\begin{aligned} V_{ps} &= \frac{D}{K_{ps}} \\ K_{ps} &= \frac{D}{V_{ps}} \\ &= \frac{11.50}{125} \\ &= \underline{9.2\%} \end{aligned}$$

6.7 VALUATION OF COMMON STOCK

In case of equity shares, the future stream of earnings or benefits pose two problems. One, it is neither specified nor perfectly known in advance as an obligation. Resulting this, future benefits and their timing have both to be estimated in a probabilistic frame work. Two, there are at least

there are three elements which are positioned as alternative measures of such benefits namely dividends, cash flows and earnings.

The valuation of common stock has three methods.

- a) zero growth model
- b) constant growth model
- c) multiple growth model

a) Zero growth model

Under this the assumption is the growth of dividend is zero or constant.

$$V_c = \frac{D}{K}$$

V_c = Value of common stock

D = Dividend paid

K = The required rate of return

Ex. A company pays a cash dividend of Birr 9 per share on common share for an indefinite period of future. The required rate of return is 10% and the market price of the share is Birr 80. Would you buy the share at its current price?

$$\begin{aligned} V_s &= \frac{D}{K} \\ &= \frac{9}{.10} \\ &= \underline{\underline{90}} \end{aligned}$$

Yes, the price is more than value, you would consider buying the share.

b) Constant Growth Model

The dividend payable to common stock holders will grow at a uniform rate in future. It can be written as below.

$$V_c = \frac{D_0 (1 + g)}{k - g}$$

D_0 = Dividend paid

g = growth rate

k = desired rate of return.

Ex. Alfa Company paid a dividend of Birr 2 per share on common stock for the year ending March 31, 2003. a constant growth of 10% per annum has been forecast for an indefinite future. Investors required rate of return is 15%. You want to buy the share at market price quoted on July 31, 2003 is stock market at Birr 60 what would be your decision?

$$\begin{aligned} V_s &= \frac{D_0 (1 + g)}{k - g} \\ &= \frac{2 (1 + .10)}{15 - .10} \\ &= \frac{2 (1.10)}{.05} \\ &= \frac{2.20}{.05} \\ &= 44 \end{aligned}$$

Value is less than price, so you do not buy.

Ex. Nissan Ltd paid a dividend of Birr 4 per share for the ending march 31, 2003. The growth rate is 10% forever. The required rate of return is 15%. You want to buy the share at a market price of Birr 80 in stock exchange. What would you do?

$$\begin{aligned} V_c &= \frac{D_0 (1 + g)}{k - g} \\ &= \frac{4 (1 + .10)}{15 - .10} \\ &= \frac{4.40}{.05} \\ &= 88 \end{aligned}$$

Here the price is more than value. Hence, you prefer to buy.

c) Multiple-Growth Model:

The multiple growth assumption has to be made in a vast number of practical situations. The infinite future time period is viewed as divisible into two or more different segments.

The investor must forecast the time 'T' up to which growth would be variable and after which only the growth rate would show a pattern and would be constant. This mean that present value calculations will have to be spread over two phases viz. one phase would last until time 'T' and the other would begin after 'T' to maturity.

$$\text{Growth Rate}_1 = \frac{D_1 - D_0}{D_0}$$

$$\text{Growth Rate}_2 = \frac{D_2 - D_1}{D_1}$$

$$V_{T(1)} = \frac{D_t}{(1 + k)^t}$$

$$V_{T(2)} = \frac{D_T + 1}{(k - g)(1 + k)^T}$$

Combined equation for $V_{T(1)} + V_{T(2)}$

$$= \frac{D_t}{(1 + k)^t} + \frac{D_T + 1}{(k - g)(1 + k)^T}$$

Ex. Ethio Power Corporation paid dividend of 0.75 cents per share during the last year. The company is expected to pay Birr 2 per share during next year. Investors tore cast is a dividend of Birr 3 per share after that. At this time, the forecast is that dividends will grow at 10% per year into an indefinite period. Would you buy/sell the share if the current price is Birr 54. The required rate of return is 15%.

Solution:

This is a case of multiple growth. The growth rates for the first phase must be worked out and time partition. Growth rates before T are

$$g_1 = \frac{D_1 - D_0}{D_0}$$

$$= \frac{2.75}{.75}$$

$$= \underline{1.25}$$

$$.75$$

$$= \underline{167\%}$$

$$g_2 = \frac{D_2 - D_1}{D_1}$$

$$= \frac{3 - 2}{2}$$

$$= \frac{1}{2}$$

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

$$V_{T(1)} = \frac{D_t}{(1 + k)^t}$$

$$= \frac{2}{(1 + .15)} + \frac{3}{(1 + .15)^2}$$

$$V_{T(2)} = \frac{D_T + 1}{(k - g)(1 + k)^T}$$

$$= \frac{3.30}{(.15 - 10)(1 + .15)^2}$$

$$= \frac{3.30}{(.05)(1 + .15)^2}$$

$$= \frac{3.30}{(.05)(1 + .15)^2}$$

$$= \underline{49.91}$$

$$V_0 = V_{T(1)} + V_{T(2)}$$

$$= 4.01 + 49.91$$

$$= \underline{53.92}$$

The current price is 54 Birr, the share is fairly and priced you can buy it.

Check your progress – I

1. Abebe is considering investment in the equity shares of leader Hindustan Lever Limited has performed detailed analysis and research into the history and performance of the

company. To be sound, what other information should be obtained before taking the final decision.

.....
.....
.....

2. A 5% Birr 1000 bond has 25 years remaining to maturity. What would be the intrinsic value of bond today if current market yield is 6.5%. Interest is payable on the bond semiannually?

.....
.....
.....

3. A 5% Birr 1000 bond paying interest at an annual interval and having 25 years to maturity is currently selling for Birr 816. it is anticipated that the market yield is likely to decline 5.5%. Estimate the intrinsic value of the bond two years.

.....
.....
.....

6.8 SUMMARY

This unit has discussed in detail the various types of securities, their features, importance and their uses in financing mix. It is also presented in this unit how value the securities and factors that influence the price and value of securities. This unit will enable you to calculate the values of all the securities like bonds, preference stock and common stock.

6.9 ANSWERS TO CHECK YOUR PROGRESS

1. a) Current state of the economy
b) Historical relationship of consummate with aggregate economy

c) Historical relationship of HLL to the consummate industry's performance

$$\begin{aligned} 2. \quad V &= 25 (24.5516) + 1000 (.202) \\ &= 815.90 \end{aligned}$$

$$\begin{aligned} 3. \quad V &= 50 (12.875) + 1000 (.291) \\ &= \underline{935.65} \end{aligned}$$

6.10 MODEL EXAMINATION QUESTIONS

1. What is a bond?
2. Explain yield to call and maturity
3. What are the formulae for constant growth model of common stock?

6.11 REFERENCES

- | | | |
|---------------------|---|--|
| □ Kuchhal S.C. | : | Financial management, Chaitanya Publishing House Allahabad. |
| □ Pandey IM. | : | Financial management, Vikas Publishing House Put Ltd.
New Delhi. |
| □ Brigham EF | : | Fundamentals of Financial Management Dryden Press, Chicago |
| □ Gitman L.J | : | Principles of Managerial Finance Harper Row, New York. |
| □ Prasanny Chandra: | | Financial Management Theory and Practice Tata McGraw Hill,
New Delhi. |