

## Chapter

# 5

# Capital Structure

## INTRODUCTION

Capital is the major part of all kinds of business activities, which are decided by the size, and nature of the business concern. Capital may be raised with the help of various sources. If the company maintains proper and adequate level of capital, it will earn high profit and they can provide more dividends to its shareholders.

### Meaning of Capital Structure

Capital structure refers to the kinds of securities and the proportionate amounts that make up capitalization. It is the mix of different sources of long-term sources such as equity shares, preference shares, debentures, long-term loans and retained earnings.

The term capital structure refers to the relationship between the various long-term source financing such as equity capital, preference share capital and debt capital. Deciding the suitable capital structure is the important decision of the financial management because it is closely related to the value of the firm.

Capital structure is the permanent financing of the company represented primarily by long-term debt and equity.

### Definition of Capital Structure

The following definitions clearly initiate, the meaning and objective of the capital structures.

According to the definition of **Gerestenbeg**, “Capital Structure of a company refers to the composition or make up of its capitalization and it includes all long-term capital resources”.

According to the definition of **James C. Van Horne**, “The mix of a firm’s permanent long-term financing represented by debt, preferred stock, and common stock equity”.

According to the definition of **Presana Chandra**, “The composition of a firm’s financing consists of equity, preference, and debt”.

According to the definition of **R.H. Wessel**, “The long term sources of fund employed in a business enterprise”.

## FINANCIAL STRUCTURE

The term financial structure is different from the capital structure. Financial structure shows the pattern total financing. It measures the extent to which total funds are available to finance the total assets of the business.

$$\text{Financial Structure} = \text{Total liabilities}$$

Or

$$\text{Financial Structure} = \text{Capital Structure} + \text{Current liabilities.}$$

The following points indicate the difference between the financial structure and capital structure.

Financial Structures	Capital Structures
1. It includes both long-term and short-term sources of funds	1. It includes only the long-term sources of funds.
2. It means the entire liabilities side of the balance sheet.	2. It means only the long-term liabilities of the company.
3. Financial structures consist of all sources of capital.	3. It consist of equity, preference and retained earning capital.
4. It will not be more important while determining the value of the firm.	4. It is one of the major determinations of the value of the firm.

### Example

From the following information, calculate the capitalization, capital structure and financial structures.

#### Balance Sheet

Liabilities		Assets	
Equity share capital	50,000	Fixed assets	25,000
Preference share capital	5,000	Good will	10,000
Debentures	6,000	Stock	15,000
Retained earnings	4,000	Bills receivable	5,000
Bills payable	2,000	Debtors	5,000
Creditors	3,000	Cash and bank	10,000
	70,000		70,000

#### (i) Calculation of Capitalization

S. No.	Sources	Amount
1.	Equity share capital	50,000
2.	Preference share capital	5,000
3.	Debentures	6,000
	<b>Capitalization</b>	<b>61,000</b>

**(ii) Calculation of Capital Structures**

S. No.	Sources	Amount	Proportion
1.	Equity share capital	50,000	76.92
2.	Preference share capital	5,000	7.69
3.	Debentures	6,000	9.23
4.	Retained earnings	4,000	6.16
		<b>65,000</b>	<b>100%</b>

**(iii) Calculation of Financial Structure**

S. No.	Sources	Amount	Proportion
1.	Equity share capital	50,000	71.42
2.	Preference share capital	5,000	7.14
3.	Debentures	6,000	8.58
4.	Retained earnings	4,000	5.72
5.	Bills payable	2,000	2.85
6.	Creditors	3,000	4.29
		<b>70,000</b>	<b>100%</b>

**OPTIMUM CAPITAL STRUCTURE**

Optimum capital structure is the capital structure at which the weighted average cost of capital is minimum and thereby the value of the firm is maximum.

Optimum capital structure may be defined as the capital structure or combination of debt and equity, that leads to the maximum value of the firm.

**Objectives of Capital Structure**

Decision of capital structure aims at the following two important objectives:

1. Maximize the value of the firm.
2. Minimize the overall cost of capital.

**Forms of Capital Structure**

Capital structure pattern varies from company to company and the availability of finance. Normally the following forms of capital structure are popular in practice.

- Equity shares only.
- Equity and preference shares only.
- Equity and Debentures only.
- Equity shares, preference shares and debentures.

## FACTORS DETERMINING CAPITAL STRUCTURE

The following factors are considered while deciding the capital structure of the firm.

### Leverage

It is the basic and important factor, which affect the capital structure. It uses the fixed cost financing such as debt, equity and preference share capital. It is closely related to the overall cost of capital.

### Cost of Capital

Cost of capital constitutes the major part for deciding the capital structure of a firm. Normally long- term finance such as equity and debt consist of fixed cost while mobilization. When the cost of capital increases, value of the firm will also decrease. Hence the firm must take careful steps to reduce the cost of capital.

- (a) **Nature of the business:** Use of fixed interest/dividend bearing finance depends upon the nature of the business. If the business consists of long period of operation, it will apply for equity than debt, and it will reduce the cost of capital.
- (b) **Size of the company:** It also affects the capital structure of a firm. If the firm belongs to large scale, it can manage the financial requirements with the help of internal sources. But if it is small size, they will go for external finance. It consists of high cost of capital.
- (c) **Legal requirements:** Legal requirements are also one of the considerations while dividing the capital structure of a firm. For example, banking companies are restricted to raise funds from some sources.
- (d) **Requirement of investors:** In order to collect funds from different type of investors, it will be appropriate for the companies to issue different sources of securities.

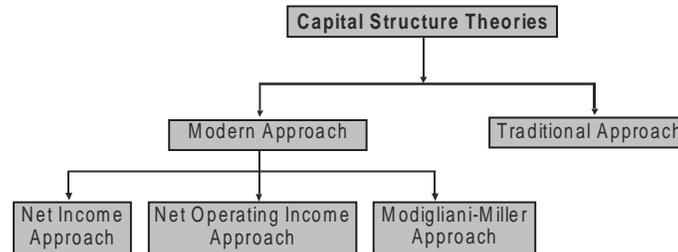
### Government policy

Promoter contribution is fixed by the company Act. It restricts to mobilize large, long-term funds from external sources. Hence the company must consider government policy regarding the capital structure.

## CAPITAL STRUCTURE THEORIES

Capital structure is the major part of the firm's financial decision which affects the value of the firm and it leads to change EBIT and market value of the shares. There is a relationship among the capital structure, cost of capital and value of the firm. The aim of effective capital structure is to maximize the value of the firm and to reduce the cost of capital.

There are two major theories explaining the relationship between capital structure, cost of capital and value of the firm.



**Fig. 5.1** Capital Structure Theories

### Traditional Approach

It is the mix of Net Income approach and Net Operating Income approach. Hence, it is also called as intermediate approach. According to the traditional approach, mix of debt and equity capital can increase the value of the firm by reducing overall cost of capital up to certain level of debt. Traditional approach states that the  $K_0$  decreases only within the responsible limit of financial leverage and when reaching the minimum level, it starts increasing with financial leverage.

### Assumptions

Capital structure theories are based on certain assumption to analysis in a single and convenient manner:

- There are only two sources of funds used by a firm; debt and shares.
- The firm pays 100 % of its earning as dividend.
- The total assets are given and do not change.
- The total finance remains constant.
- The operating profits (EBIT) are not expected to grow.
- The business risk remains constant.
- The firm has a perpetual life.
- The investors behave rationally.

### Exercise 1

ABC Ltd., needs Rs. 30,00,000 for the installation of a new factory. The new factory expects to yield annual earnings before interest and tax (EBIT) of Rs.5,00,000. In choosing a financial plan, ABC Ltd., has an objective of maximizing earnings per share (EPS). The company proposes to issuing ordinary shares and raising debit of Rs. 3,00,000 and Rs. 10,00,000 of Rs. 15,00,000. The current market price per share is Rs. 250 and is expected to drop to Rs. 200 if the funds are borrowed in excess of Rs. 12,00,000. Funds can be raised at the following rates.

- up to Rs. 3,00,000 at 8%
  - over Rs. 3,00,000 to Rs. 15,000,00 at 10%
  - over Rs. 15,00,000 at 15%
- Assuming a tax rate of 50% advise the company.

**Solution**

Earnings Before Interest and Tax (BIT) less Interest Earnings Before Tax less: Tax@50%.

Alternatives		
I (Rs. 3,00,000 debt)	II Rs. 10,00,000 debt)	III (Rs. 15,00,000 debt)
5,00,000	5,00,000	5,00,000
24,000	1,00,000	2,25,000
4,76,000	4,00,000	2,75,000
2,38,000	2,00,000	1,37,500
2,38,000	2,00,000	1,37,500
27,00,000	20,00,000	15,00,000
250	250	200
10800	8,000	7,500
2,38,000	2,00,000	1,37,500
No. of shares 10,800	8,000	7,500
Earnings per share 22.03	25	18.33

The secure alternative which gives the highest earnings per share is the best. Therefore the company is advised to revise Rs. 10,00,000 through debt amount Rs. 20,00,000 through ordinary shares.

**Exercise 2**

Compute the market value of the firm, value of shares and the average cost of capital from the following information.

Net operating income                      Rs. 1,00,000

Total investment                            Rs. 5,00,000

Equity capitalization Rate:

- (a) If the firm uses no debt 10%
- (b) If the firm uses Rs. 25,000 debentures 11%
- (c) If the firm uses Rs. 4,00,000 debentures 13%

Assume that Rs. 5,00,000 debentures can be raised at 6% rate of interest whereas Rs. 4,00,000 debentures can be raised at 7% rate of interest.

**Solution**

Computation of market value of firm value of shares and the average cost of capital.

Particulars	(a) No Debt	(b) Rs. 2,50,000 6% debentures	(c) Rs. 4,00,000 7% debentures
Net operating system	1,00,000	1,00,000	1,00,000
(-) Interest (i.e.)			
Cost of debt	–	15,000	28,000
Earnings available to Equity shareholders	1,00,000	85,000	72,000
Equity Capitalization Rate	10%	11%	13%
Market value of shares	$10,000 \times \frac{10}{100}$	$85,000 \times \frac{100}{11}$	$72,000 \times \frac{100}{13}$
Market Value of firm	Rs. 10,00,000/- 10,00,000 1,00,000	Rs. 772727/- 10,22,727 1,00,000	Rs. 553846/- 9,53,846 1,00,000
Average cost of capital	$\frac{1,00,000}{10,00,000} \times 100$	$\frac{1,00,000}{10,22,727} \times 100$	$\frac{1,00,000}{9,53,846} \times 100$
$\frac{\text{Earnings}}{\text{Value of the firm}}$			
$\frac{\text{EBIT}}{V}$	=10%	=9.78%	=10.48%

### Comments

From the above data, if debt of Rs. 2,50,000 is used, the value of the firm increases and the overall cost of capital decreases. But, if more debt is used to finance in place of equity i.e., Rs. 4,00,000 debentures, the value of the firm decreases and the overall cost of capital increases.

### Net Income (NI) Approach

Net income approach suggested by the Durand. According to this approach, the capital structure decision is relevant to the valuation of the firm. In other words, a change in the capital structure leads to a corresponding change in the overall cost of capital as well as the total value of the firm.

According to this approach, use more debt finance to reduce the overall cost of capital and increase the value of firm.

Net income approach is based on the following three important assumptions:

1. There are no corporate taxes.
2. The cost debt is less than the cost of equity.
3. The use of debt does not change the risk perception of the investor.

where

$$V = S + B$$

V = Value of firm

S = Market value of equity

B = Market value of debt

Market value of the equity can be ascertained by the following formula:

$$S = \frac{NI}{K_e}$$

where

NI = Earnings available to equity shareholder

$K_e$  = Cost of equity/equity capitalization rate

Format for calculating value of the firm on the basis of NI approach.

Particulars	Amount
Net operating income (EBIT)	XXX
Less: interest on debenture (i)	XXX
Earnings available to equity holder (NI)	XXX
Equity capitalization rate ( $K_e$ )	XXX
Market value of equity (S)	XXX
Market value of debt (B)	XXX
Total value of the firm (S+B)	XXX
Overall cost of capital = $K_o = EBIT/V(\%)$	XXX%

### Exercise 3

- (a) A Company expects a net income of Rs. 1,00,000. It has Rs. 2,50,000, 8% debentures. The equality capitalization rate of the company is 10%. Calculate the value of the firm and overall capitalization rate according to the net income approach (ignoring income tax).
- (b) If the debenture debts are increased to Rs. 4,00,000. What shall be the value of the firm and the overall capitalization rate?

### Solution

- (a) Capitalization of the value of the firm

	Rs.
Net income	1,00,000
Less: Interest on 8% Debentures of Rs. 2,50,000	20,000
Earnings available to equality shareholders	<u>80,000</u>
Equity capitalization rate	10%

$$= \frac{80,000}{10} \times 100$$

Market value of equity	=	8,00,000
Market value of debentures	=	<u>2,50,000</u>
Value of the firm	=	<u>10,50,000</u>

#### Calculation of overall capitalization rate

$$\begin{aligned} \text{Overall cost of capital (K}_o\text{)} &= \frac{\text{Earnings}}{\text{Value of the firm}} \frac{\text{EBIT}}{V} \\ &= \frac{1,00,000}{10,50,000} \times 100 \\ &= 9.52\% \end{aligned}$$

(b) Calculation of value of the firm if debenture debt is raised to Rs. 3,00,000.

	Rs.
Net income	1,00,000
Less: Interest on 8% Debentures of Rs. 4,00,000	<u>32,000</u>
Equity Capitalization rate	<u>68,000</u>
	10%
Market value of equity	$= 68,000 \times \frac{100}{10} = 6,80,000$
	$= 6,80,000$
Market value of Debentures	$= 4,00,000$
Value of firm	$= 10,80,000$
Overall cost of capital	$= \frac{1,00,000}{10,80,000} \times 10$
	$= 9.26\%$

Thus, it is evident that with the increase in debt financing, the value of the firm has increased and the overall cost of capital has increased.

#### Net Operating Income (NOI) Approach

Another modern theory of capital structure, suggested by **Durand**. This is just the opposite to the Net Income approach. According to this approach, Capital Structure decision is irrelevant to the valuation of the firm. The market value of the firm is not at all affected by the capital structure changes.

According to this approach, the change in capital structure will not lead to any change in the total value of the firm and market price of shares as well as the overall cost of capital.

NI approach is based on the following important assumptions;

The overall cost of capital remains constant;

There are no corporate taxes;

The market capitalizes the value of the firm as a whole;

Value of the firm (V) can be calculated with the help of the following formula

$$V = \frac{\text{EBIT}}{K_o}$$

Where,

V = Value of the firm

EBIT = Earnings before interest and tax

$K_o$  = Overall cost of capital

#### Exercise 4

XYZ expects a net operating income of Rs. 2,00,000. It has 8,00,000, 6% debentures. The overall capitalization rate is 10%. Calculate the value of the firm and the equity capitalization rate (Cost of Equity) according to the net operating income approach.

If the debentures debt is increased to Rs. 10,00,000. What will be the effect on volume of the firm and the equity capitalization rate?

#### Solution

Net operating income = Rs. 2,00,000

Overall cost of capital = 10%

Market value of the firm (V)

$$\begin{aligned} &= \frac{\text{EBIT}}{K_o} \\ &= 2,00,000 \times \frac{100}{10} = \text{Rs. } 20,00,000 \end{aligned}$$

Market value of the firm = Rs. 20,00,000

Less: market value of Debentures =  $\frac{\text{Rs. } 8,00,000}{12,00,000}$

Equity capitalization rate (or) cost of equity ( $K_e$ )

$$= \frac{\text{EBIT} - I}{V - D}$$

Where, V = value of the firm

D = value of the debt capital

$$\begin{aligned} &= \frac{2,00,000 - 48,000}{20,00,000 - 8,00,000} \times 100 \\ &= 12.67\% \end{aligned}$$

If the debentures debt is increased to Rs. 10,00,000, the value of the firm shall remain changed to Rs. 20,00,000. The equity capitalization rate will increase as follows:

$$\begin{aligned}
 &= \frac{\text{EBIT} - I}{V - D} \\
 &= \frac{2,00,000 - 60,000}{20,00,000 - 10,00,000} \times 100 \\
 &= \frac{1,40,000}{10,00,000} \times 100 \\
 &= 14\% .
 \end{aligned}$$

### Exercise 5

Abinaya company Ltd. expresses a net operating income of Rs. 2,00,000. It has Rs. 8,00,000 to 7% debentures. The overall capitalization rate is 10%.

- Calculate the value of the firm and the equity capitalization rate (or) cost of equity according to the net operating income approach.
- If the debenture debt is increased to Rs. 12,00,000. What will be the effect on the value of the firm, the equity capitalization rate?

### Solution

(a) Net operating income = Rs. 2,00,000

Over all cost of capital = 10%

Market value of the firm (V)

$$\begin{aligned}
 &\frac{\text{NOI(EBIT)}}{\text{Overall cost of capital(OK)}}
 \end{aligned}$$

$$= 2,00,000 \times 100/10$$

$$= \text{Rs. } 20,00,000$$

Market value of firm = Rs. 20,00,000

Less Market value of debentures = Rs. 8,00,000

Total marketing value of equity = Rs. 12,00,000

Equity capitalization rate (or) cost of equity ( $K_e$ )

$$= \frac{\text{EBIT} - I}{V - D}$$

$$= \frac{2,00,000 - 56,000}{20,00,000 - 8,00,000} \times 100$$

$$= \frac{1,44,000}{12,00,000} \times 100$$

$$= 12\%$$

where I = Interest of debt

V = Value of the firm

D = Value of debt capital

I = 8,00,000 × 7% = 56,000

V = 20,00,000

D = 8,00,000

(b) If the debenture debt is increased at Rs. 12,00,000, the value of the firm shall changed to Rs. 20,00,000.

Equity Capitalization Rate ( $K_e$ )

$$\begin{aligned} &= \frac{\text{EBIT} - I}{V - D} \\ &= \frac{2,00,000 - 84,000}{20,00,000 - 12,00,000} \\ &= 14.5\% \end{aligned}$$

where I = 12,00,000 at 7% = 84,000

### Modigliani and Miller Approach

Modigliani and Miller approach states that the financing decision of a firm does not affect the market value of a firm in a perfect capital market. In other words MM approach maintains that the average cost of capital does not change with change in the debt weighted equity mix or capital structures of the firm.

Modigliani and Miller approach is based on the following important assumptions:

- There is a perfect capital market.
- There are no retained earnings.
- There are no corporate taxes.
- The investors act rationally.
- The dividend payout ratio is 100%.
- The business consists of the same level of business risk.

Value of the firm can be calculated with the help of the following formula:

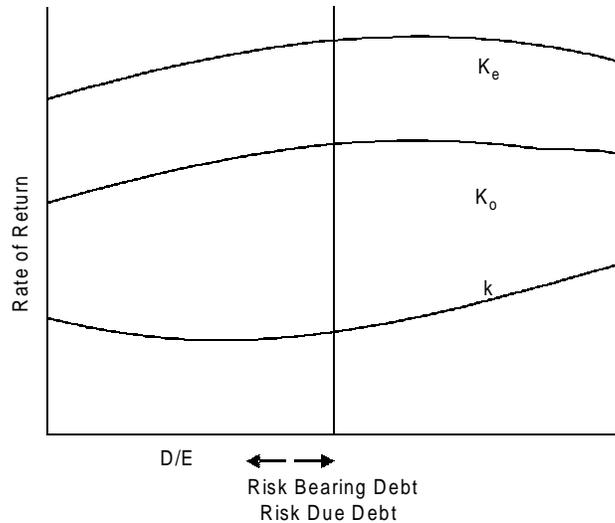
$$\frac{\text{EBIT}}{K_o}(1 - t)$$

Where

EBIT = Earnings before interest and tax

$K_o$  = Overall cost of capital

t = Tax rate



**Fig. 5.2** Modigliani and Miller Approach

### Exercise 6

There are two firms 'A' and 'B' which are exactly identical except that A does not use any debt in its financing, while B has Rs. 2,50,000, 6% Debentures in its financing. Both the firms have earnings before interest and tax of Rs. 75,000 and the equity capitalization rate is 10%. Assuming the corporation tax is 50%, calculate the value of the firm.

### Solution

The market value of firm A which does not use any debt.

$$\begin{aligned} V_u &= \frac{\text{EBIT}}{K_o} \\ &= \frac{75,000}{10/100} = 75,000 \times 100/10 \\ &= \text{Rs. } 7,50,000 \end{aligned}$$

The market value of firm B which uses debt financing of Rs. 2,50,000

$$\begin{aligned} V_t &= V_u + t \\ V_u &= 7,50,000, \quad t = 50\% \text{ of Rs. } 2,50,000 \\ &= 7,50,000 + 1,25,000 \\ &= \text{Rs. } 8,75,000 \end{aligned}$$

### Exercise 7

The following data regarding the two companies 'X' and 'Y' belonging to the same equivalent class:

	Company 'X'	Company 'Y'
Number of ordinary shares	75,000	1,25,000
5% debentures	40,000	—
Market price per shares	Rs. 1.25	Rs. 1.00
Profit before interest	Rs. 25,000	Rs. 25,000

All profits after paying debenture interest are distributed as dividends.

You are required to explain how under Modigliani and Miller approach, an investor holding 10% of shares in company 'X' will be better off in switching his holding to company 'Y'.

### Solution

As per the opinion of Modigliani and Miller, two similar firms in all respects except their capital structure cannot have different market values because of arbitrage process. In case two similar firms except for their capital structure have different market values, arbitrage will take place and the investors will engage in 'personal leverage' as against the corporate leverage. In the given problem, the arbitrage will work out as below.

1. The investor will sell in the market 10% of shares in company 'X' for

$$75,000 \times 10/100 \times 1.25 = \text{Rs. } 9375$$

2. He will raise a loan of Rs.  $40,000 \times 10/100 = \text{Rs. } 4000$

To take advantage of personal leverage as against the corporate leverage the company 'Y' does not use debt content in its capital structure. He will put 13375 shares in company 'Y' with the total amount realized from 1 and 2 i.e., Rs. 9375 plus Rs. 4000. Thus he will have 10.7% of shares in company 'Y'.

The investor will gain by switching his holding as below:

<b>Present income of the investor in company 'X'</b>	<b>Rs.</b>
Profit before Interest of the Company	25,000
Less: Interest on Debentures 5%	2,000
Profit after Interest	23,000
Share of the investor = 10% of Rs. 23,000 i.e., Rs. 2300	
<b>Income of the investor after switching holding to company</b>	
Profit before Interest of the company	Rs. 25,000
Less Interest	—
Profit after Interest	25,000
Share of the investor : $25,000 \times \frac{13,375}{1,25,000}$	= Rs. 2,675
Interest paid on loan taken $4000 \times 5/100$	200
<b>Net Income of the Investor</b>	<b><u>2,475</u></b>

As the net income of the investor in company 'Y' is higher than the cost of income from company 'X' due to switching the holding, the investor will gain in switching his holdings to company 'Y'.

### Exercise 8

Paramount Products Ltd. wants to raise Rs. 100 lakh for diversification project. Current estimates of EBIT from the new project is Rs. 22 lakh p.a.

Cost of debt will be 15% for amounts up to and including Rs. 40 lakh, 16% for additional amounts up to and including Rs. 50 lakh and 18% for additional amounts above Rs. 50 lakh. The equity shares (face value of Rs. 10) of the company have a current market value of Rs. 40. This is expected to fall to Rs. 32 if debts exceeding Rs. 50 lakh are raised. The following options are under consideration of the company.

Option	Debt	Equity
I	50%	50%
II	40%	60%
III	60%	40%

Determine EPS for each option and state which option should the Company adopt.

Tax rate is 50%.

(ICWA Inter Dec. 1997)

### Solution

	I	II	III
Equity	50,00,000	60,00,000	40,00,000
Debt	50,00,000	40,00,000	60,00,000
Amount to be raised	<u>1,00,00,000</u>	<u>1,00,00,000</u>	<u>1,00,00,000</u>
EBIT	22,00,000	22,00,000	22,00,000
Less: Interest of Debt	7,60,000	6,00,000	9,40,000
PBT	14,40,000	16,00,000	12,60,000
Less : Tax @ 50%	<u>7,20,000</u>	<u>8,00,000</u>	<u>6,30,000</u>
PAT	<u>7,20,000</u>	<u>8,00,000</u>	<u>6,30,000</u>
No. of equity shares	1,25,000	1,50,000	1,25,000
	Rs. 5.76	Rs. 5.33	Rs. 5.04

### Working Notes

Calculation of Interest on Debt

Total Debt	I	II	III
Interest on:	50,00,000	40,00,000	60,00,000
Ist Rs. 40,00,000 @ 15%	6,00,000	6,00,000	6,00,000
Next Rs.10,00,000 @ 16%	1,60,000	—	1,60,000
Balance Rs. 10,00,000 @ 18%	—	—	1,80,000
	<u>7,60,000</u>	<u>6,00,000</u>	<u>9,40,000</u>

**Exercise 9**

The following is the data regarding two Company's. X and Y belonging to the same risk class.

	X	Y
No. of ordinary shares	90,000	1,50,000
Market price/share (Rs.)	1.2	1.0
6% debentures	60,000	–
Profit before interest	18,000	18,000

All profits after interest are distributed as dividend.

Explain how under Modigliani & Miller Approach an investor holding 10% of shares in Company X will be better off in switching his holding to Company Y.

(CA Final Nov. 1993)

**Solution**

Both the firms have EBIT of Rs. 18,000. Company X has to pay interest of Rs. 3600 (i.e., 6% on Rs. 60,000) and the remaining profit of Rs. 14,400 is being distributed among the shareholders. The Company Y on the other hand has no interest liability and therefore is distributing Rs.18,000 among the shareholders.

The investor will be well off under MM Model by selling the shares of X and shifting to shares of Y company through the arbitrage process as follows. If he sells shares of X Company He gets Rs. 10,800 (9,000 shares @ Rs.1.2 per share). He now takes a 6% loan of Rs.6,000

(i.e. 10% of Rs. 60,000) and out of the total cash of Rs. 16,800 he purchases 10% of shares of Company Y for Rs. 15,000; his position with regard to Company Y would be as follows:

	X	Y
Dividends (10% of Profits)	1,440	1,800
Less:Interest (6% on Rs. 6,000)	–	360
Net Income	1,440	1,440

Thus by shifting from Company Y the investor is able to get the same income of Rs. 1,440 and still having funds of Rs. 1,800 (i.e., Rs. 16,800 – 15,000) at his disposal. He is better off not in terms of income but in terms of having capital of Rs. 1,800 with him which he can invest elsewhere.

**Exercise 10**

Gentry Motors Ltd., a producer of turbine generators, is in this situation; EBIT = Rs. 40 lac. rate = 35%, dept. outstanding = D = Rs. 20 lac., rate of Interest = 10%,  $K_e$  = 15%, shares of stock outstanding = No. = Rs. 6,00,000 and book value per share = Rs. 10. Since Gentry's product market is stable and the Company expects no growth, all earnings are paid out as dividends. The debt consists of perpetual bonds. What are the Gentry's EBS and its price per share,  $P_0$ ?

(CS Final Dec. 1998)

**Solution**

(a) EBIT	40,00,000
interest @ 10 %	<u>2,00,000</u>
	38,00,000
Tax @ 35 %	<u>13,30,000</u>
	24,70,000
No. of shares	6,00,000
EPS (or Dividend)	Rs. 4.12
$K_e$ (given)	15 %
$P_o$ ( <i>i.e.</i> , $D/K_e$ )	4.12/.15
	$\Rightarrow$ Rs. 27.47

In the same question if the Company increases its debt by Rs. 80 lakh to a total of Rs. 1 crore using the new debt to buy and retire of its shares at current price, its interest rate on debt will be 12% and its cost of equity will rise from 15% to 17%. EBIT will remain constant, should this Company change its capital structure.

If Company decides to increase its debt by Rs. 80 lacs, the Company may buy back  $80,00,000 \div 27.47 = 2,91,226$  shares. Thereafter the remaining no. of shares would be 3,08,774 (*i.e.*,  $6,00,000 - 2,91,226$ ).

The market price of the share may be ascertained as follows:

EBIT	40,00,000
Interest @ 12% on Rs. 1 crore	12,00,000
	28,00,000
Tax @ 35%	9,80,000
	18,20,000
No. of equity shares	3,08,774
EPS	Rs. 5.89
$K_e$	17 %
$P_o$ ( <i>i.e.</i> , $D/K_e$ )	5.89
	.17
	= Rs. 34.64

As the price is expected to rise from 27.47 to Rs 34.64, the Company may change its capital structure by raising debt and retaining some number of shares.

### MODEL QUESTIONS

1. Define capital structure.
2. Differentiate the capital structure and financial structure.
3. What is optimum capital structure?
4. Discuss the various factors affecting the capital structure.
5. Explain the capital structure theories.
6. XYZ Ltd., expects a net income of Rs. 1,50,000. The company has 10% of 5,00,000 Debentures. The equity capitalization rate of the company is 10%.
  - (a) Calculate the value of the firm and overall capitalization rate according to the net income approach (ignoring income tax).
  - (b) If the debenture debt is increased to Rs. 7,50,000 and interest of debt is change to 9%. What is the value of the firm and overall capitalization rate?  
(Ans. (a) Rs. 15,00,000, 10% (b) Rs. 15,75,000 and 9.52%)
7. A Company Ltd., projected net operating income of Rs. 75,000. It has Rs. 3,00,000, 8% debentures.
  - (a) Calculate the value of the firm according to 10 net opening income and overall capitalization rate is 10%.
  - (b) If debenture debt is increased to Rs. 5,00,000. What is the value of the firm and the equity capitalization rate? (Ans. (a) Rs. 7,50,000, (b) 11.33%, 14%)
8. According to Traditional approach, compute the market value of the firm, value of shares and the average cost of capital from the following information:
 

Net Operating Income 1,00,000  
Total Investment 7,00,000  
Equity capitalization Rate:

  - (a) if the firms uses no debt 7%.
  - (b) if the firm uses Rs. 2,00,000 debentures 8%
  - (c) if the firm uses Rs. 4,00,000 debentures 9%

Assume that Rs 2,00,000 debentures at 6% rate of interest whereas Rs. 4,00,000 debentures at 6% rate of interest whereas Rs. 4,00,000 debentures at 7% rate of interest.  
(Ans. 7%, 7.69%, 8.33)