

Chapter 4
ANALYSING FINANCIAL PERFORMANCE

1. The summarised Profit and Loss Account and Balance Sheet of a company are given below.

(All amounts in Rs. million)

Profit and Loss Account for year ended March 31, 2010

• Total revenue	4,800
• Operating profit (PBIT)	950
• Interest and finance charges	110
• PBT	840
• Provision for tax	260
• PAT	580

Balance Sheet as at March 31, 20X9

Sources of Funds

Shareholders' funds	1,500
Loan funds	1,000
Deferred tax liability	70
	2,570

Application of Funds

Fixed assets	1,600
Investments	70
Current assets, loans, and advances	2,350
Inventories : 1,400	
Debtors : 700	
Others : 250	
Current liabilities and provisions	1400
Net current assets	900
	2,570

The paid up capital of the company as at March 31, 2010 is Rs.300 million (Par value per share is Rs. 5). Assume that all of it is equity. The market price per share on March 31, 2010 was Rs. 200.

Fill in the values below (correct to two decimal places). Regard deferred tax liability as part of debt and consider an year to consist of 360 days

- | | |
|-----------------------------|-------|
| • Net profit margin | ----- |
| • Asset turnover ratio | ----- |
| • Average collection period | ----- |
| • Return on equity | ----- |

- Interest coverage ratio -----
- Price–earnings ratio -----
- Market value to book value ratio -----

2. The summarised Profit and Loss Account and Balance Sheet of a company are given below.

(All amounts in Rs. million)

Profit and Loss Account for year ended March 31, 20X9

• Total revenue	6,870
• Operating profit (PBIT)	1,360
• Interest and finance charges	160
• PBT	1,200
• Provision for tax	480
• PAT	720

Balance Sheet as at March 31, 20X9

Sources of Funds

Shareholders' funds	2,200
Loan funds	1,700
Deferred tax liability	100
	<u>4,000</u>

Application of Funds

Fixed assets	2,400
Investments	200
Current assets, loans, and advances	3,400
Inventories : 2,000	
Debtors : 1,000	
Others : 400	
Current liabilities and provisions	2,000
Net current assets	1,400
	<u>4,000</u>

- The paid up capital of the company as at March 31, 20X9 is Rs.400 million (Par value per share is Rs. 5). Assume that all of it is equity. The market price per share on March 31, 20X9 was Rs. 350.

Fill in the values below (correct to two decimal places). Regard deferred tax liability as part of debt and consider an year to consist of 360 days

- Net profit margin -----
- Asset turnover ratio -----
- Average collection period -----

- Return on equity -----
- Interest coverage ratio -----
- Price–earnings ratio -----
- Market value to book value ratio -----

3. The summarised Profit and Loss Account and Balance Sheet of Nirvan Limited are given below.

(All amounts in Rs. million)

Profit and Loss Account for year ended March 31, 2009

• Total revenue	8,590
• Operating profit (PBIT)	1,700
• Interest and finance charges	180
• PBT	1,520
• Provision for tax	480
• PAT	1,040

Balance Sheet as at March 31, 2009

Sources of Funds

Shareholders' funds	2,850
Loan funds	2,150
Deferred tax liability	80
	5,080

Application of Funds

Fixed assets	3,050
Investments	180
Current assets, loans, and advances	4,330
Inventories : 2,750	
Debtors : 1,500	
Others : 80	
Current liabilities and provisions	2,480
Net current assets	1,850
	5,080

- The paid up capital of Nirvan Limited as at March 31, 2008 is Rs.250 million (Par value per share is Rs. 5). Assume that all of it is equity. The market price per share on March 31, 2008 was Rs. 220.

Fill in the values below (correct to two decimal places). Regard deferred tax liability as part of debt.

- Net profit margin -----
- Asset turnover ratio -----
- Average collection period -----

- Return on equity -----
- Interest coverage ratio -----
- Price–earnings ratio -----
- Market value to book value ratio -----

4. The following ratios are given for Sunshine Ltd.

Net profit margin	:	10 percent
Current ratio	:	2.21
Return on net worth	:	21.6 percent
Debt to total assets	:	37.5 percent
Inventory turnover ratio	:	3.6

Complete the following statements

Profit and Loss Account

Sales	-----	
Cost of goods sold	-----	
Operating expenses	1,800	
EBIT	-----	
Interest (10 percent)	210	
Profit before tax	-----	
Tax provision (23.64 percent)	-----	
Profit after tax	-----	

Balance Sheet

Net worth	-----	Fixed assets	-----
Debt	-----	Current assets	4200
		Cash	-----
		Receivables	1800
		Inventory	-----
		Current liabilities	-----
		Net current assets	-----
	-----		-----
	5600		5600
	-----		-----

5. The following ratios are given for Prakash Ltd.

Net profit margin	:	9 percent
Current ratio	:	1.6
Return on net worth	:	45 percent
Debt to total assets	:	66.33 %
Inventory turnover ratio	:	8

Complete the following statements

Profit and Loss Account

Sales	-----
Cost of goods sold	-----
Operating expenses	1,269
EBIT	-----
Interest (13 percent)	256
Profit before tax	-----
Tax provision (28 percent)	-----
Profit after tax	-----

Balance Sheet

Net worth	-----	Fixed assets	-----
Debt	-----	Current assets	1645
		Cash	-----
		Receivables	750
		Inventory	-----
		Current liabilities	-----
		Net current assets	-----
	<hr/>		<hr/>
	2970		2970

6. Determine the current assets of a firm given the following information:

Sales	=	100,000
Quick ratio	=	0.6
Current liabilities	=	25,000
Inventory turnover ratio	=	5

7. Determine the current liabilities of a firm given the following information:

Sales	=	800,000
Quick ratio	=	0.7
Current assets	=	240,000
Inventory turnover ratio	=	8

8. Determine the current liabilities of a firm given the following information:

Sales	=	720,000
Quick ratio	=	0.8
Current assets	=	200,000
Inventory turnover ratio	=	6

9. Complete the balance sheet and sales data (fill in the blanks) using the following financial data. Consider a year to consist of 360 days.

Debt-equity ratio	:	0.5
Acid-test ratio	:	1.4
Total asset turnover	:	2
Days' sales outstanding in accounts receivable	:	24 days
Gross profit margin	:	30 percent
Inventory turnover ratio	:	11.25

Balance Sheet

Equity capital	420,000	Fixed assets	-----
Retained earnings	180,000	Inventories	-----
Long-term debt	200,000	Accounts receivable	-----
Short-term debt	-----	Cash	-----
	-----		-----

Profit & Loss

Sales	-----
Cost of goods sold	-----

10. Complete the balance sheet and sales data (fill in the blanks) using the following financial data. Consider a year to consist of 360 days.

Debt-equity ratio	:	0.5
Acid-test ratio	:	0.6
Total asset turnover	:	3
Days' sales outstanding in accounts receivable	:	6.76 days
Gross profit margin	:	30 percent
Inventory turnover ratio	:	12

Balance Sheet

Equity capital	70,000	Fixed assets	-----
Retained earnings	50,000	Inventories	-----

Long-term debt	40,000	Accounts receivable	-----
Short-term debt	-----	Cash	-----

Profit & Loss

Sales	-----
Cost of goods sold	-----

11. Complete the balance sheet and sales data (fill in the blanks) using the following financial data. Consider an year to consist of 360 days.

Debt-equity ratio	:	0.6
Acid-test ratio	:	0.5
Total asset turnover	:	2
Days' sales outstanding in accounts receivable	:	13.5 days
Gross profit margin	:	37.5 percent
Inventory turnover ratio	:	5

Balance Sheet

Equity capital	150,000	Fixed assets	-----
Retained earnings	100,000	Inventories	-----
Long-term debt	70,000	Accounts receivable	-----
Short-term debt	-----	Cash	-----

Profit & Loss

Sales	-----
cost of goods sold	-----

12. The following ratios are given for National Ltd.

Net profit margin	:	5.9105 percent
Current ratio	:	1.45
Return on net worth	:	14.86 percent
Debt to total assets	:	36.014 percent
Inventory turnover ratio	:	5.36

Complete the following statements

Profit and Loss Account

Sales	-----
Cost of goods sold	-----
Operating expenses	3,200
EBIT	-----
Interest (9 percent)	270
Profit before tax	-----
Tax provision (34 percent)	-----
Profit after tax	-----

Balance Sheet

Net worth	-----	Fixed assets	-----
Debt	-----	Current assets	6,090
		Cash	-----
		Receivables	3,000
		Inventory	-----
		Current liabilities	-----
		Net current assets	-----
	<hr/>		<hr/>
	8,330		8,330
	<hr/>		<hr/>

Chapter 5
FINANCIAL PLANNING AND FORECASTING

1. The following information is available for a company: $A^*/S = 0.8$, $\square S = \text{Rs. } 400$ million, $L^*/S = 0.30$, $m = 0.20$, $S_1 = \text{Rs. } 1000$ million and $r = 0.7$. What are the additional funds needed for the forthcoming year?

2. The following information is available for a company.

Net profit margin	:	8 %
Asset turnover	:	6
Equity multiplier	:	1.8

If the company wants to have a sustainable growth rate of 30 % what should be its retention ratio?

3. The following information is available for a company: $A^*/S = 0.7$, $\square S = \text{Rs. } 300$ million, $L^*/S = 0.20$, $m = 0.15$, $S_1 = \text{Rs. } 800$ million and $r = 0.8$. What are the additional funds needed for the forthcoming year?

4. The following information is available for a company.

Net profit margin	:	10 %
Asset turnover	:	4
Equity multiplier	:	1.5

If the company wants to have a sustainable growth rate of 35 % what should be its retention ratio?

5. The following information is available for a company: $A^*/S = 0.6$, $\square S = \text{Rs. } 200$ million, $L^*/S = 0.30$, $m = 0.12$, $S_1 = \text{Rs. } 180$ million and $r = 0.7$. What is the additional funds needed for the forthcoming year?

6. The following information is available for a company.

Net profit margin	:	15 %
Asset turnover	:	2.3
Equity multiplier	:	1.2

If the company wants to have a sustainable growth rate of 25 % what should be its retention ratio?

Chapter 6
TIME VALUE OF MONEY

1. A company borrows Rs. 10,000,000 at an interest rate of 10 % per year and the loan with interest is to be repaid in 5 equal instalments payable at the end of each of the next 5 years.
 - (i) What is the annual instalment payable?
 - (ii) What proportion of the instalment payable at the end of year 2, represents the principal repayment portion?

2. None of the aboveA firm borrows Rs. 8,000,000 at an interest rate of 12 % per year and the loan with interest is to be repaid in 5 equal instalments payable at the end of each of the next 5 years.
 - (i) What is the annual instalment payable?
 - (ii) What proportion of the instalment payable at the end of year 2, represents the principal repayment portion?

3. A firm borrows Rs. 10,000,000 at an interest rate of 10 % per year and the loan with interest is to be repaid in 8 equal instalments payable at the end of each of the next 8 years.
 - (i) What is the annual instalment payable?
 - (ii) What proportion of the instalment payable at the end of year 2, represents the principal repayment portion?

4. As an investment advisor, you have been approached by a client called Vishal for advice on some financial matters. Vishal is 40 years old and has Rs. 1,000,000 in bank. He plans to work for 20 years more and retire at the age of 60. His present salary is Rs. 1,800,000 per year. He expects his salary to increase at the rate of 10 percent per year until his retirement.

Vishal has decided to invest his bank balance and future savings in a balanced mutual fund scheme which he believes will provide a return of 12 percent per year.

Vishal seeks your help in answering several questions given below. In answering these questions, ignore the tax factor.

- (i) Once he retires at the age of 60, he would like to withdraw Rs. 2,000,000 per year for his consumption needs for the following 15 years (his life expectancy is 75 years). Each annual withdrawal will be made at the beginning of the year. How much should be the value of his investments when he reaches the age of 60, to meet his retirement need?

- (ii) How much should Vishal save each year for the next 20 years to be able to withdraw Rs. 2,000,000 per year from the beginning of the 61st year for a period of 15 years? Assume that the savings will occur at the end of each year. Remember that Vishal already has some bank balance. Give the answer correct to the nearest hundred rupees.
- (iii) Suppose Vishal wants to give a donation of Rs. 300,000 per year for the last 4 years of his life to a charitable cause. Each donation would be made at the end of the year. Further, he wants to bequeath Rs. 6,000,000 to his daughter at the end of his life. How much should he have in his investment account when he reaches the age of 60 to meet his need for donation and bequeathing? Give the answer correct to the nearest hundred rupees.
- (iv) Vishal wants to find out the present value of his lifetime salary income. For the sake of simplicity, assume that his current salary of Rs. 1,800,000 will be paid exactly a year from now, and his salary is paid annually. What is the present value of his life time salary income, if the discount rate applicable to the same is 9 percent? Remember that Vishal expects his salary to increase at the rate of 10 percent per year until retirement. Give the answer correct to the nearest hundred rupees.
5. As an investment advisor, you have been approached by a client called Nitin for advice on some financial matters. Nitin is 30 years old and has Rs.1,000,000 in bank. He plans to work for 25 years more and retire at the age of 55. His present salary is Rs.1,200,000 per year. He expects his salary to increase at the rate of 10 percent per year until his retirement.

Nitin has decided to invest his bank balance and future savings in a balanced mutual fund scheme which he believes will provide a return of 10 percent per year.

Nitin seeks your help in answering several questions given below. In answering these questions, ignore the tax factor.

- (i) Once he retires at the age of 55, he would like to withdraw Rs. 3,000,000 per year for his consumption needs for the following 20 years (his life expectancy is 75 years). Each annual withdrawal will be made at the beginning of the year. How much should be the value of his investments when he reaches the age of 55, to meet his retirement need?
- (ii) How much should Nitin save each year for the next 25 years to be able to withdraw Rs.3,000,000 per year from the beginning of the 26th year for a period of 20 years? Assume that the savings will occur at the end of each year. Remember that he already has some bank balance
- (iii) Suppose Nitin wants to donate Rs.800,000 per year in the last 5 years of his life to a charitable cause. Each donation would be made at the beginning of the year. Further, he wants to bequeath Rs.9,000,000 to his son at the end of his life. How much should he have in his investment account when he reaches the age of 55 to meet this need for donating

and bequeathing? Approximate it to the nearest '000.

- (iv) Nitin wants to find out the present value of his lifetime salary income. For the sake of simplicity, assume that his current salary of Rs. 1,200,000 will be paid exactly a year from now, and his salary is paid annually. What is the present value of his life time salary income, if the discount rate applicable to the same is 13 percent? Remember that Nitin expects his salary to increase at the rate of 10 percent per year until retirement.

6. As an investment advisor, you have been approached by a client called Sathya for advice on some financial matters. Sathya is 40 years old and has Rs.3,000,000 in bank. He plans to work for 20 years more and retire at the age of 60. His present salary is Rs.1,800,000 per year. He expects his salary to increase at the rate of 15 percent per year until his retirement.

Sathya has decided to invest his bank balance and future savings in a balanced mutual fund scheme which he believes will provide a return of 12 percent per year.

Sathya seeks your help in answering several questions given below. In answering these questions, ignore the tax factor.

- (i) Once he retires at the age of 60, he would like to withdraw Rs. 5,000,000 per year for his consumption needs for the following 20 years (his life expectancy is 80 years). Each annual withdrawal will be made at the beginning of the year. How much should be the value of his investments when he reaches the age of 60, to meet his retirement need?
- (ii) How much should Sathya save each year for the next 20 years to be able to withdraw Rs.5,000,000 per year from the beginning of the 21st year for a period of 20 years? Assume that the savings will occur at the end of each year. Remember that he already has some bank balance. Give the answer to the nearest '000.
- (iii) Suppose Sathya wants to donate Rs.1,000,000 per year in the last 5 years of his life to a charitable cause. Each donation would be made at the beginning of the year. Further, he wants to bequeath Rs.10,000,000 to his son at the end of his life. How much should he have in his investment account when he reaches the age of 60 to meet this need for donating and bequeathing? Approximate it to the nearest '000.
- (iv) Sathya wants to find out the present value of his lifetime salary income. For the sake of simplicity, assume that his current salary of Rs. 1,800,000 will be paid exactly a year from now, and his salary is paid annually. What is the present value of his life time salary income, if the discount rate applicable to the same is 10 percent? Remember that Sathya expects his salary to increase at the rate of 15 percent per year until retirement.

Chapter 7

VALUATION OF BONDS AND STOCKS

1. A Rs. 1000 par value bond, bearing a coupon rate of 12 % payable semi-annually will mature after 5 years.
 - (i) If the required rate of return on the bond is 16 % p.a., what is its value?
 - (ii) If the bond is currently selling at Rs. 965, what is the approximate YTM per annum?

2. A Rs. 1000 par value bond, bearing a coupon rate of 10 % payable semi-annually will mature after 4 years.
 - (i) If the required rate of return on the bond is 8 % p.a., what is its value?
 - (ii) If the bond is currently selling at Rs. 1100, what is the approximate YTM per annum?

3. A Rs.100 par bond carrying a coupon rate of 10 percent and maturing after 4 years is selling for Rs. 102.
 - (i) What is the approximate YTM?
 - (ii) What will be the realised yield to maturity if the reinvestment rate is 8 percent?

4. A Rs. 1000 par value bond, bearing a coupon rate of 16 % payable semi-annually will mature after 3 years.
 - (i) If the required rate of return on the bond is 12 % p.a., what is its value?
 - (ii) If the bond is currently selling at Rs. 1050, what is the approximate YTM per annum?

5. A Rs.1,000 par bond carrying a coupon rate of 8 percent and maturing after 8 years is selling for Rs. 1,100.

What is the approximate YTM?

6. The risk-free rate is 6 percent and the expected return on the market portfolio is 15%. The beta of a stock is 1.8. Its dividends and earnings are expected to grow at a constant rate of 10 % per annum forever. The dividend paid just now is Rs.10.00. What should be the intrinsic value per share of the stock?

7. The following information is available for a bond.
 - Face Value Rs. 100
 - Coupon (interest rate) 12 percent payable annually
 - Term to maturity 8 years
 - Redemption value Rs. 100

- Current market price Rs. 108

- (i) What is the YTM of the bond? Use the approximate formula.
 - (ii) What is the duration of the bond? Use the approximate formula for calculating the yield to maturity.
 - (iii) If the yield on the bond decreases by 50 basis points, what will be the approximate change in the bond price?
8. The equity stock of a firm is currently selling for Rs. 200 per share. The expected dividend a year from now is Rs. 15.00. The investors' required rate of return on the stock is 25%. If the constant growth model applies to the firm, what is the expected growth rate?
9. The current dividend on an equity share of Max Limited is Rs. 6.00 on an earnings per share of Rs. 20.00.
- (i) Assume that the dividend per share will grow at the rate of 16 percent per year for the next 8 years. Thereafter, the growth rate is expected to fall and stabilise at 9 percent. Investors require a return of 13 percent from Max's equity shares. What is the intrinsic value of Max's equity share?
 - (ii) Assume that the growth rate of 16 percent will decline linearly over an 8 year period and then stabilise at 9 percent. What is the intrinsic value of Max's share if the investors' required rate of return is 13 percent?
10. The current dividend on an equity share of Zipro Limited is Rs.12.00 on an earnings per share of Rs. 60.00.
- (i) Assume that the dividend per share will grow at the rate of 25 percent per year for the next 6 years. Thereafter, the growth rate is expected to fall and stabilise at 15 percent. Investors require a return of 18 percent from Zipro's equity shares. What is the intrinsic value of Zipro's equity share?
 - (ii) Assume that the growth rate of 25 percent will decline linearly over a six year period and then stabilise at 15 percent. What is the intrinsic value of Omega's share if the investors' required rate of return is 18 percent?
 - (iii) Assume that the dividend is expected to grow at a rate of 16 percent annually forever from now on and investors require a return of 18 percent from Zipro's equity shares. What will be the retrospective price-earnings ratio (P_0/E_0) for Zipro?
11. The equity stock of a firm is currently selling for Rs. 200 per share. The expected dividend a year from now is Rs. 15.00. The investors' required rate of return on the stock is 25%. If the constant growth model applies to the firm, what is the expected growth rate?
12. The equity stock of Rajni Ltd. is currently selling for Rs. 280 per share. The expected dividend a year from now is Rs. 20.00. The investors' required rate of return on the stock is 25%. If the constant growth model applies to Rajni Ltd. what is the expected growth rate?

Chapter 8

RISK AND RETURN

1. The probability distribution of the rate of return on the equity shares of Levers Limited is as follows:

<i>Rate of Return</i>	<i>Probability</i>
20 %	0.7
50 %	0.1
30 %	0.2

- (i) What is the expected rate of return?
(ii) What is the standard deviation of the return?
2. The probability distribution of the rate of return on a company's stock is as follows:

<i>Rate of Return</i>	<i>Probability</i>
10 %	0.6
15 %	0.2
20 %	0.2

- (i) What is the expected rate of return?
(ii) What is the standard deviation of the return?
3. The probability distribution of the rate of return on a company's stock is as follows:

<i>Rate of Return</i>	<i>Probability</i>
20 %	0.3
30 %	0.3
40 %	0.4

- (i) What is the expected rate of return?
(ii) What is the standard deviation of the return?

Chapter 9

RISK AND RETURN: PORTFOLIO THEORY AND ASSET PRICING MODELS

1. A portfolio consists of two securities 1 and 2. The following information is available: $w_1 = 0.4$, $w_2 = 0.6$, $\sigma_1 = 0.3$, $\sigma_2 = 0.4$ and $\rho_{12} = 0.7$. What is the standard deviation of portfolio return?
2. A portfolio consists of two securities X and Y. The following information is available: $w_1 = 0.8$, $w_2 = 0.2$, $\sigma_1 = 0.4$, $\sigma_2 = 0.8$ and $\rho_{12} = 0.60$. What is the standard deviation of portfolio return?
3. A portfolio consists of two securities L and M. The following information is available: $w_1 = 0.3$, $w_2 = 0.7$, $\sigma_1 = 0.5$, $\sigma_2 = 0.2$ and $\rho_{12} = 0.60$. What is the standard deviation of portfolio return?
4. The risk-free rate is 9 percent and the expected return on the market portfolio is 12%. The beta of stock Premier Ltd. is 1.2. Its dividends and earnings are expected to grow at a constant rate of 8% per annum forever. The dividend paid just now is Rs. 15.00. What should be the intrinsic value per share of Premier stock?
5. After investing in mutual funds for nearly a decade, Dinesh Rao, a young software engineer was brimming with confidence on his abilities on making the right investment choices. He thought the time had come to venture directly into the exciting field of equities. So very recently he did some own research and invested Rs. 4 million in Amol Sugars, and Rs. 3 million each in Basera Realtors and Creative Systems. Unfortunately for him the markets decided to take a nap soon thereafter and Dinesh became restless. He has called on you, his friend and a promising financial consultant, for answers to the following doubts.
 - (a) What is the expected return and risk (standard deviation) of the portfolio?
 - (b) What is the scope for appreciation in market price of the three stocks - are they overvalued or undervalued?

You have already been tracking two of the stocks, viz. Amol Sugars and Basera Realtors -their betas being 1.8 and 2.3 respectively.

Further, you have obtained the following historical data on the returns of Creative Systems.

Period	Market return (%)	Return on Creative Systems (%)
-----	-----	-----
1	12	18
2	10	20
3	(5)	(12)
4	(2)	3
5	12	22
6	15	30

On the future returns of the three stocks, you are able to obtain the following forecast from a reputed firm of portfolio managers.

State of the Economy	Probability	Returns (in percentage)				
		Treasury Bills	Amol Sugars(A)	Basera Realtors (B)	Creative Systems (C)	Sensex (M)
Recession	0.2	8	-2	- 5	- 4	- 2
Normal	0.2	8	15	18	18	14
Boom	0.6	8	22	26	28	18

Required:

Prepare your detailed note answering the questions.

- The risk-free rate is 8 percent and the expected return on the market portfolio is 14%. The beta of a stock is 1.1. Its dividends and earnings are expected to grow at a constant rate of 12 % per annum forever. The dividend paid just now is Rs.15.00. What should be the intrinsic value per share of the stock?

Chapter 10
OPTIONS AND THEIR VALUATION

1. An equity share is currently selling for Rs. 180. In a year's time, it can rise by 10 percent or fall by 15 percent. The exercise price of a call option on this share is Rs. 190.
 - (i) What is the value of the call option if the risk-free rate is 8 percent? Use the option-equivalent method.
 - (ii) What is the value of the call option if the risk-free rate is 8 percent? Use the risk-neutral method.

2. An equity share is currently selling for Rs. 800. In a year's time, it can rise by 15 percent or fall by 20 percent. The exercise price of a call option on this share is Rs. 820.
 - (i) What is the value of the call option if the risk-free rate is 6 percent? Use the option-equivalent method.
 - (ii) What is the value of the call option if the risk-free rate is 8 percent? Use the risk-neutral method.

3. An equity share is currently selling for Rs. 100. In a year's time, it can rise by 20 percent or fall by 10 percent. The exercise price of a call option on this share is Rs. 105.
 - (i) What is the value of the call option if the risk-free rate is 7 percent? Use the option-equivalent method.
 - (ii) Calculate the value of the call option using the risk-neutral method.

4. Binomial Model An equity share is currently selling for Rs. 40. In a year's time, it can rise by 25 percent or fall by 15 percent. The exercise price of a call option on this share is Rs. 42.
 - (i) What is the value of the call option if the risk-free rate is 5 percent? Use the option-equivalent method.
 - (ii) Calculate the value of the call option using the risk-neutral method.

5. An equity share is currently selling for Rs. 560. In a year's time, it can rise by 30 percent or fall by 20 percent. The exercise price of a call option on this share is Rs. 600.
 - (i) What is the value of the call option if the risk-free rate is 8 percent? Use the option-equivalent method.

 - (ii) What is the value of the call option if the risk-free rate is 8 percent? Use the risk-neutral method.

6. Consider the following data for a certain share

- Price of the share now = $S_0 = \text{Rs. } 430$
- Exercise price = $E = \text{Rs. } 450$
- Standard deviation of continuously compounded annual return = $\sigma = 0.4$
- Expiration period of the call option = 3 months
- Risk-free interest rate = 8 percent

What is the value of the call option? Use the normal distribution table given along this booklet and resort to linear interpolation.

7. Consider the following data for a certain share

- Price of the share now = $S_0 = \text{Rs. } 50$
- Exercise price = $E = \text{Rs. } 54$
- Standard deviation of continuously compounded annual return = $\sigma = 0.2$
- Expiration period of the call option = 6 months
- Risk-free interest rate = 5 percent

What is the value of the call option? Use the normal distribution table given along with this booklet and resort to linear interpolation.

8. Option Valuation: Black-Scholes Model Consider the following data for a certain share

- Price of the share now = $S_0 = \text{Rs. } 90$
- Exercise price = $E = \text{Rs. } 100$
- Standard deviation of continuously compounded annual return = $\sigma = 0.4$
- Expiration period of the call option = 6 months
- Risk-free interest rate = 8 percent

What is the value of the call option? Use the normal distribution table given along this booklet and resort to linear interpolation.

9. Consider the following data for a certain share

- Price of the share now = $S_0 = \text{Rs. } 300$
- Exercise price = $E = \text{Rs. } 320$
- Standard deviation of continuously compounded annual return = $\sigma = 0.3$
- Expiration period of the call option = 3 months
- Risk-free interest rate = 8 percent

What is the value of the call option? Use the normal distribution table given along with this booklet and resort to linear interpolation.

10. Consider the following data for a certain share

- Price of the share now = $S_0 = \text{Rs. } 30$
- Exercise price = $E = \text{Rs. } 32$
- Standard deviation of continuously compounded annual return = $\sigma = 0.25$
- Expiration period of the call option = 3 months

- Risk-free interest rate = 6 percent

What is the value of the call option? Use the normal distribution table given along this booklet and resort to linear interpolation.

Chapter 11
TECHNIQUES OF CAPITAL BUDGETING

1. Deepak Industries is evaluating a project with an initial investment of 1100. The expected cash inflows are as follows

Year	1	2	3	4
Cash flow	200	500	600	250

The cost of capital for Deepak Industries is 15 percent.

- (i) What is the NPV of the project?
(ii) What is the IRR of the project?
2. Sarda Industries is evaluating a project with an initial investment of 5000. The expected cash inflows are as follows

Year	1	2	3	4
Cash flow	1000	2000	2500	2200

The cost of capital for Sarda Industries is 18 percent.

- (i) What is the NPV of the project?
(ii) What is the IRR of the project?
3. Pushkar Limited is evaluating a project whose expected cash flows are as follows:

<u>Year</u>	<u>Cash flow (Rs. in million)</u>
0	(600)
1	200
2	300
3	220
4	194

The cost of capital for Pushkar Limited is 14 percent.

- (i) What is the NPV of the project?
(ii) What is the IRR of the project?
4. Jeevan Industries is evaluating a project whose expected cash flows are as follows

<u>Year</u>	<u>Cash flow</u>
0	- 450,000
1	100,000
2	150,000
3	260,000
4	180,000

The cost of capital for Jeevan Industries is 15 percent.

- (i) What is the NPV of the project?
- (ii) What is the IRR of the project?

5. Bharat Limited is evaluating a project whose expected cash flows are as follows:

<u>Year</u>	<u>Cash flow (Rs. in million)</u>
5	(380)
6	100
7	200
8	150
9	100

The cost of capital for Bharat Limited is 15 percent.

- (i) What is the NPV of the project?
- (ii) What is the IRR of the project?

6. Vivek Limited is evaluating a project whose expected cash flows are as follows:

<u>Year</u>	<u>Cash flow (Rs. in million)</u>
10	(130)
11	30
12	80
13	60
14	20

The cost of capital for Vivek Limited is 16 percent.

- (i) What is the NPV of the project?
- (ii) What is the IRR of the project?

Chapter 12
ESTIMATION OF PROJECT CASH FLOWS

1. Minar Corporation is considering the manufacture of a new formulation to be named Liveon for which the following information has been gathered.

Liveon is expected to have a product life cycle of five years after which it will be withdrawn from the market. The sales from this product are expected to be as follows:

Year	1	2	3	4	5
Sales (Rs. in million)	600	1200	2000	1600	1000

- The capital equipment required for manufacturing Liveon costs Rs. 400 million and it will be depreciated at the rate of 25 percent per year as per the WDV method for tax purposes. The expected net salvage value after 5 years is Rs. 100 million.
- The working capital requirement for the project is expected to be 15 % of sales. Working capital level will be adjusted at the beginning of the year in relation to the sales for the year. At the end of five years, working capital is expected to be liquidated at par.
- The firm has estimated the cost of Liveon as follows:

Raw material cost	:	30 percent of sales
Variable manufacturing cost	:	20 percent of sales
Fixed annual operating and maintenance costs	:	Rs. 30 million
Variable selling expenses	:	25 percent of sales

- The tax rate for the firm is 33 percent.

Required:

- (a) Estimate the post-tax incremental cash flows for the project to manufacture Liveon.
 (b) What is the NPV of the project if the cost of capital is 14 percent?

2. Amar Enterprises is considering the manufacture of a new health drink to be named Amrit for which the following information has been gathered.

Amrit is expected to have a product life cycle of five years after which it will be withdrawn from the market. The sales from this product are expected to be as follows:

Year	1	2	3	4	5
Sales (Rs. in million)	200	500	600	400	200

- The capital equipment required for manufacturing Amrit costs Rs. 100 million and it will be depreciated at the rate of 20 percent per year as per the WDV method for tax purposes. The expected net salvage value after 5 years is Rs. 40 million.

- The working capital requirement for the project is expected to be 20% of sales. Working capital level will be adjusted at the beginning of the year in relation to the sales for the year. At the end of five years, working capital is expected to be liquidated at par.
- The firm has estimated the cost of Amrit as follows:

Raw material cost	: 40 percent of sales
Variable manufacturing cost	: 15 percent of sales
Fixed annual operating and maintenance costs	: Rs. 10 million
Variable selling expenses	: 25 percent of sales
- The tax rate for the firm is 30 percent.

Required:

- (a) Estimate the post-tax incremental cash flows for the project to manufacture Amrit.
- (b) What is the NPV of the project if the cost of capital is 15 percent?

3. Arogya Limited is a leader in the health drinks industry. It is considering manufacture of a new health drink called Liva.

You have recently joined Arogya as a finance officer and you report to the Vice President (Finance), who coordinates the capital budgeting activity. You have been asked to develop the financials for Liva.

After discussing with marketing, technical, and other personnel, you have gathered the following information.

The Liva project has an economic life of 5 years. It would generate a revenue of Rs.300 million in year 1 which will rise by Rs. 100 million per year for the following two years. Thereafter, revenues will decline by Rs.80 million per year for the remaining two years. Operating costs (costs before depreciation, interest, and taxes) will be 40 percent of revenues. Liva is expected to erode the revenues of an existing bulk drug. Due to this erosion there will be a loss of Rs.20 million per year by way of contribution margin for 5 years. While there may be some other impacts as well, they may be ignored in the present analysis.

Liva will require an outlay of Rs.200 million in plant and machinery right in the beginning. The same will be financed by equity and term loan in the ratio 2:3. The term loan will carry an interest of 15 percent per annum and will be repayable in 3 equal annual instalments, the first instalment falling due at the end of year 3.

For tax purposes, the depreciation rate will be 20 percent as per the written down value method. The net salvage value of plant and machinery after 5 years is expected to be Rs.50 million.

The net working capital requirement will be 20 percent of revenues. Assume that the investment in net working capital will be made right in the beginning of each year and the same will be fully financed by working capital advance carrying an interest rate of 14 percent per annum. At the end of 5 years the working capital is expected to be liquidated at par. The effective tax rate is 32%

Required

- (a) Estimate the net cash flows relating to explicit cost funds (investor claims) over the 5-year period.
 - (b) Estimate the net cash flows relating to equity over the 5-year period.
4. Mewar Industries is planning a project involving replacement of an old machine with a new machine. The old machine bought a few years ago has a book value of Rs. 100 lakhs and it can be sold to realise a post-tax salvage value of Rs. 50 lakhs. It has a remaining life of 5 years after which its net salvage value is expected to be Rs. 20 lakhs. It is being depreciated annually at a rate of 20 percent under WDV method.

The new machine costs Rs. 200 lakhs. It is expected to fetch a net salvage value of Rs. 80 lakhs after 5 years. The depreciation rate applicable to it is 20 percent under WDV method. The incremental working capital associated with this machine is Rs. 70 lakhs and it is expected to be recovered at its book value at the end of 5 years. The new machine is expected to bring a savings of Rs. 48 lakhs annually in manufacturing costs (other than depreciation). The tax rate applicable to the firm is 33 percent.

Estimate the cash flow associated with the replacement project.

5. Baxi Limited is a leader in the bulk drug industry. It is considering manufacture of a new bulk drug called BXI-4.

You have recently joined Baxi as a finance officer and you report to Yoshimoto, Vice President (Finance), who coordinates the capital budgeting activity. You have been asked to develop the financials for BXI-4.

After discussing with marketing, technical, and other personnel, you have gathered the following information.

The BXI-4 project has an economic life of 5 years. It would generate a revenue of Rs.200 million in year1 which will rise by Rs.20 million per year for the following two years. Thereafter, revenues will decline by Rs.10 million per year for the remaining two years. Operating costs (costs before depreciation, interest, and taxes) will be 50 percent of revenues. BXI-4 is expected to erode the revenues of an existing bulk drug. Due to this erosion there will be a loss of Rs.10 million per year by way of contribution margin for 5 years. While there may be some other impacts as well, they may be ignored in the present analysis.

BXI-4 will require an outlay of Rs.100 million in plant and machinery right in the beginning. The same will be financed by equity and term loan in the ratio 3:2. The term loan will carry an interest of 14 percent per annum and will be repayable in 4 equal annual instalments, the first instalment falling due at the end of year 2.

For tax purposes, the depreciation rate will be 15 percent as per the written down value method. The net salvage value of plant and machinery after 5 years is expected to be Rs.30 million.

The net working capital requirement will be 25 percent of revenues. Assume that the investment in net working capital will be made right in the beginning of each year and the same will be fully financed by working capital advance carrying an interest rate of 12 percent per annum. At the end of 5

years the working capital is expected to be liquidated at par. The effective tax rate is 30%

Required

- (a) Estimate the net cash flows relating to explicit cost funds (investor claims) over the 5-year period.
- (b) Estimate the net cash flows relating to equity over the 5-year period.

6. Swadisht Corporation is considering the manufacture of a new health drink for which the following information has been gathered.

The new product is expected to have a product life cycle of five years after which it will be withdrawn from the market. The sales from this product are expected to be as follows:

Year	1	2	3	4	5
Sales (Rs. in million)	1000	1400	1500	900	500

- The capital equipment required for manufacturing the new product costs Rs. 500 million and it will be depreciated at the rate of 20 percent per year as per the WDV method for tax purposes. The expected net salvage value after 5 years is Rs. 120 million.
- The working capital requirement for the project is expected to be 25% of sales. Working capital level will be adjusted at the beginning of the year in relation to the sales for the year. At the end of five years, working capital is expected to be liquidated at par.
- The accountant of the firm has provided the following estimates for the cost of the new product.

Raw material cost	:	40 percent of sales
Variable manufacturing cost	:	25 percent of sales
Fixed annual operating and maintenance costs	:	Rs. 20 million
Variable selling expenses	:	12 percent of sales

- The tax rate for the firm is 30 percent.

Required:

- (a) Estimate the post-tax incremental cash flows for the project to manufacture the new product.
- (b) What is the NPV of the project if the cost of capital is 20 percent?

Chapter 13
RISK ANALYSIS IN CAPITAL BUDGETING

1. A project requires an investment of Rs. 1000 million. The unit selling price is Rs.50 and the unit variable cost is Rs.30. Fixed costs other than depreciation will be Rs. 400 million per year. Depreciation will be Rs. 150 million per year for tax purposes. The life of the project is 8 years. The effective tax rate is 30 percent. The cost of capital is 16 percent. What is the financial break-even point?

2. A project requires an investment of Rs. 80 million. The unit selling price is Rs.1800 and the unit variable cost is Rs.1296. Fixed costs other than depreciation will be Rs. 20 million per year. Depreciation will be Rs. 12 million per year for tax purposes. The life of the project is 8 years. The effective tax rate is 30 percent. The cost of capital is 13 percent. What is the financial break-even point? Give your answer correct to the nearest million.

3. A project requires an investment of Rs. 200 million. The unit selling price is Rs.600 and the unit variable cost is Rs.450. Fixed costs other than depreciation will be Rs. 60 million per year. Depreciation will be Rs. 30 million per year for tax purposes. The life of the project is 6 years. The effective tax rate is 32 percent. The cost of capital is 15 percent. What is the financial break-even point?

Chapter 14
THE COST OF CAPITAL

1. The latest balance sheet of Karishma Ltd. is given below

(Rs. in lakhs)

Liabilities		Assets	
Equity capital	6,000	Fixed assets	13,000
Preference capital	800	Investments	1,000
Reserves and Surplus	4,000	Current assets, loans and advances	6,000
Debentures	4,500		
Working capital loan	2,500		
Current liabilities & Provisions	2,200		
	20,000		20,000

The target capital structure of Karishma Ltd. has 50 percent equity, 10 percent preference, and 40 percent debt. Karishma Ltd's preference capital has a post-tax cost of 13 percent. Karishma Ltd's debentures have a face value of Rs. 1000 each, residual maturity of 4 years and carry an annual coupon rate of 15 percent. The market price of these debentures is Rs. 1100. Working capital loan carries an interest rate of 14 percent. Karishma Ltd's equity stock is currently selling for Rs. 250 per share. Its last dividend was Rs. 6.00 per share and the dividend per share is expected to grow at a rate of 15 percent per year in future.

Karishma Ltd's equity beta is 1.5, the risk-free rate is 8 percent, and the market risk premium is 7 percent. Karishma Ltd's tax rate is 31 percent.

- (i) What is Karishma Ltd.'s average pre-tax cost of debt?
(Use the approximate yield formula)
- (ii) What is Karishma Ltd's cost of equity using the constant growth dividend discount model?
- (iii) What is Karishma Ltd's post tax weighted average cost of capital? Use the CAPM to estimate the cost of equity and employ the weights in the target capital structure.

2. The latest balance sheet of Vaibhav Ltd. is given below

(Rs. in lakhs)

Liabilities		Assets	
Equity capital	40,000	Fixed assets	80,000
Preference capital	5,000	Investments	18,000
Reserves and Surplus	60,000	Current assets, loans and advances	40,000
Debentures	15,000		
Working capital loan	10,000		
Current liabilities & Provisions	8,000		
	138,000		138,000

The target capital structure of Vaibhav Ltd. has 75 percent equity, 5 percent preference, and 20 percent debt. Vaibhav Ltd's preference capital has a post-tax cost of 12 percent. Vaibhav Ltd's debentures have a face value of Rs. 100 each, residual maturity of 4 years and carry an annual coupon rate of 10 percent. The market price of these debentures is Rs. 104. Working capital loan carries an interest rate of 14 percent. Vaibhav Ltd's equity stock is currently selling for Rs. 200 per share. Its last dividend was Rs. 2.00 per share and the dividend per share is expected to grow at a rate of 12 percent per year in future.

Vaibhav Ltd's equity beta is 1.4, the risk-free rate is 5 percent, and the market risk premium is 6 percent. Vaibhav Ltd's tax rate is 33 percent.

- (i) What is Vaibhav Ltd.'s average pre-tax cost of debt?
(Use the approximate yield formula)
- (ii) What is Vaibhav Ltd's cost of equity using the constant growth dividend discount model?
- (iii) What is Vaibhav Ltd's post tax weighted average cost of capital? Use the CAPM to estimate the cost of equity and employ the weights in the target capital structure.

3. The latest balance sheet of Uttam Ltd. is given below

(Rs. in lakhs)

Liabilities		Assets	
Equity capital	15,000	Fixed assets	32,000
Preference capital	2,000	Investments	2,800
Reserves and Surplus	10,300	Current assets, loans and advances	15,200
Debentures	11,200		
Working capital loan	6,400		
Current liabilities & Provisions	5,100		
	50,000		50,000

The target capital structure of Uttam Ltd. has 60 percent equity, 15 percent preference, and 25 percent debt. Uttam Ltd's preference capital has a post-tax cost of 12 percent. Uttam Ltd's debentures have a face value of Rs. 100 each, residual maturity of 5 years and carry an annual coupon rate of 14 percent. The market price of these debentures is Rs. 90. Working capital loan carries an interest rate of 13 percent. Uttam Ltd's equity stock is currently selling for Rs. 120 per share. Its last dividend was Rs. 3.00 per share and the dividend per share is expected to grow at a rate of 10 percent per year in future.

Uttam Ltd's equity beta is 0.8, the risk-free rate is 6 percent, and the market risk premium is 10 percent. Uttam Ltd's tax rate is 32 percent.

- (i) What is Uttam Ltd.'s average pre-tax cost of debt?
(Use the approximate yield formula)
 - (ii) What is Uttam Ltd's cost of equity using the constant growth dividend discount model?
 - (iii) What is Uttam Ltd's post tax weighted average cost of capital? Use the CAPM to estimate the cost of equity and employ the weights in the target capital structure.
4. You are looking at the valuation of a stable firm, Redrock Limited, done by an investment analyst. Based on an expected free cash flow of Rs. 42 million for the following year and an expected growth rate of 10 percent, the analyst has estimated the value of the firm to be Rs. 1200 million. However, he committed a mistake of using the book values of debt and equity. You do not know the book value weights employed by him but you know that the firm has a cost of equity of 16 percent and a post-tax cost of debt of 7 percent. The market value of equity is three times its book value, whereas the market value of debt is equal to its book value. What is the correct value of the firm?

Chapter 15

CAPITAL BUDGETING: EXTENSIONS

1. Joshila Corporation is evaluating a capital project requiring an outlay of Rs. 800 crores. It is expected to generate a net cash inflow of Rs. 220 crores per year for 6 years. The opportunity cost of capital is 16 percent. Joshila Corporation can raise a term loan of Rs. 500 crores for the project, carrying an interest rate of 15 percent per year payable annually. The principal amount will be repayable in 5 equal annual instalments commencing from the end of the second year of operations. The balance amount required for the project can be raised by issuing external equity. The issue cost is expected to be 3 percent. The effective tax rate for Joshila Corporation is 33 percent.
 - (i) What is the *base case* NPV?
 - (ii) What is the adjusted NPV if the adjustment is made only for the issue cost of external equity?
 - (iii) What is the present value of the tax shield?

2. BTM Limited is evaluating a capital project requiring an outlay of Rs. 1000 crores. It is expected to generate a net cash inflow of Rs. 400 crores per year for 5 years. The opportunity cost of capital is 12 percent. BTM Limited can raise a term loan of Rs. 600 crores for the project, carrying an interest rate of 10 percent per year payable annually. The principal amount will be repayable in 5 equal annual instalments commencing from the end of the first year of operations. The balance amount required for the project can be raised by issuing external equity. The issue cost is expected to be 6 percent. The effective tax rate for BTM Limited is 33 percent.
 - (i) What is the *base case* NPV?
 - (ii) What is the adjusted NPV if the adjustment is made only for the issue cost of external equity?
 - (iii) What is the present value of the tax shield?

3. Bright Limited is evaluating a capital project requiring an outlay of Rs. 500 crores. It is expected to generate a net cash inflow of Rs. 138 crores per year for 6 years. The opportunity cost of capital is 15 percent. Bright Limited can raise a term loan of Rs. 300 crores for the project, carrying an interest rate of 13 percent per year payable annually. The principal amount will be repayable in 6 equal annual instalments commencing from the end of the first year of operations. The balance amount required for the project can be raised by issuing external equity. The issue cost is expected to be 5 percent. The effective tax rate for Bright Limited is 31 percent.
 - (i) What is the *base case* NPV?
 - (ii) What is the adjusted NPV if the adjustment is made only for the issue cost of external equity?
 - (iii) What is the present value of the tax shield?

Chapter 20 to 22
CAPITAL STRUCTURE DECISION

1. The profit and loss account for year 1 (the year which has just ended) and the balance sheet at the end of year 1 for NTPL Limited are as follows.

<i>Balance Sheet</i>		Rs. in million	
<u>Sources of Funds</u>		<i>Profit and Loss Account</i>	
Shareholders' Funds	13,000	Sales	90,000
Paid up capital :		PBIT	28,000
(Par value of share Rs.5) :	9,000	Interest	2,000
Reserves and Surplus :	4,000	PBT	26,000
Loan Funds	20,000	Tax ($t_c = 31\%$)	8,060
	33,000	PAT	17,940
<u>Application of Funds</u>		Dividends (Rs. 6 per share)	10,800
Net fixed assets	23,000	Retained Earnings	7,140
Net current assets			
	10,000		
	33,000		

- (i) If $t_{pe} = 15\%$ and $t_{pd} = 25\%$, what is the tax advantage of a rupee of debt?
 (ii) What should have been the ROI for NTPL Limited for it to meet its target ROE of 25 percent? Note that the pre-tax cost of debt is 10 percent.
 (iii) NTPL Limited requires Rs. 4000 million of external financing for which it is

(iv) considering two alternatives:

Alternative A: Issue of 200 million equity shares of Rs. 5 par at Rs. 20 each.

Alternative B: Issue of Rs.4000 million of debentures carrying 12 percent interest rate.

What is the EPS-EBIT indifference point?

- (iv) What will be the expected dividend per share for year 2 if the expected EPS for year 2 is Rs. 12 and the target payout ratio and adjustment rates are 0.7 and 0.5 respectively? Assume that the Lintner model applies.
- (v) Given the net profit margin, dividend payout ratio, assets-to-equity ratio, and assets-to-sales ratio, as reflected in the financial statements of NTPL Limited, what rate of growth can be sustained with internal equity?
- (vi) Assume that investors expect a payoff of Rs. 260 a year from now from one share of NTPL Limited: Rs. 10 by way of dividend and Rs. 250 by way of share price. Dividend is taxed at the rate of 15 percent and capital appreciation is taxed at 10 percent. What will be the current price of NTPL Limited's share if investors expect a post-tax return of 30 percent?

2. The profit and loss account for year 1 (the year which has just ended) and the balance sheet at the end of year 1 for Aditi Limited are as follows.

<i>Balance Sheet</i>		Rs. in million	
<u>Sources of Funds</u>		<i>Profit and Loss Account</i>	
Shareholders' Funds	8,000	Sales	60,000
Paid up capital :		PBIT	9,000
(Par value of share Rs.5) :	1,000	Interest	1,320
Reserves and Surplus :	7,000	PBT	7,680
Loan Funds	12,000	Tax ($t_c = 30\%$)	2,304
	20,000	PAT	5,376
<u>Application of Funds</u>		Dividends (Rs. 10 per share)	2,000
Net fixed assets	12,000	Retained Earnings	3,376
Net current assets	8,000		
	20,000		

- (i) If $t_{pe} = 30\%$ and $t_{pd} = 20\%$, what is the tax advantage of a rupee of debt?
(ii) What should have been the ROI for Aditi Limited for it to meet its target ROE of 20 percent? Note that the pre-tax cost of debt is 11 percent.
(iii) Aditi Limited requires Rs. 800 million of external financing for which it is considering two alternatives:

Alternative A: Issue of 16 million equity shares of Rs. 5 par at Rs. 50 each.

Alternative B: Issue of Rs.800 million of debentures carrying 15 percent interest rate.

What is the EPS-EBIT indifference point?

- (iv) What will be the expected dividend per share for year 2 if the expected EPS for year 2 is Rs. 25 and the target payout ratio and adjustment rates are 0.5 and 0.4 respectively? Assume that the Lintner model applies.
- (v) Given the net profit margin, dividend payout ratio, assets-to-equity ratio, and assets-to-sales ratio, as reflected in the financial statements of Aditi Limited, what rate of growth can be sustained with internal equity?
- (vi) Assume that investors expect a payoff of Rs. 75 a year from now from one share of Aditi Limited: Rs. 12 by way of dividend and Rs. 63 by way of share price. Dividend is taxed at the rate of 20 percent and capital appreciation is taxed at 10 percent. What will be the current price of Aditi Limited's share if investors expect a post-tax return of 20 percent?

3. The profit and loss account for year 1 (the year which has just ended) and the balance sheet at the end of year 1 for Orient Ltd. are as follows.

<i>Balance Sheet</i>		Rs. in million	
<i>Balance Sheet</i>		<i>Profit and Loss Account</i>	
<u>Sources of Funds</u>			
Shareholders' Funds	5,000	Sales	25,000
Paid up capital :		PBIT	3,000
(Par value of share Rs.5) :	2,000	Interest	400
Reserves and Surplus :	3,000	PBT	2,600
Loan Funds		Tax ($t_c = 33\%$)	858
	4,000	PAT	1,742
	9,000	Dividends (Rs. 2 per share)	800
<u>Application of Funds</u>		Retained Earnings	942
Net fixed assets	7,000		
Net current assets	2,000		
	9,000		

- (i) If $t_{pe} = 30\%$ and $t_{pd} = 15\%$, what is the tax advantage of a rupee of debt?
(ii) What should have been the ROI for Orient Ltd for it to meet its target ROE of 18 percent? Note that the pre-tax cost of debt is 10 percent.
(iii) Orient Ltd requires Rs. 500 million of external financing for which it is considering two alternatives:

Alternative A: Issue of 25 million equity shares of Rs. 5 par at Rs. 20 each.

Alternative B: Issue of Rs.500 million of debentures carrying 12 percent interest rate.

What is the EPS-EBIT indifference point?

- (iv) What will be the expected dividend per share for year 2 if the expected EPS for year 2 is Rs. 6 and the target payout ratio and adjustment rates are 0.3 and 0.5 respectively? Assume that the Lintner model applies.
- (v) Given the net profit margin, dividend payout ratio, assets-to-equity ratio, and assets-to-sales ratio, as reflected in the financial statements of Orient Ltd, what rate of growth can be sustained with internal equity?
- (vi) Assume that investors expect a payoff of Rs. 43 a year from now from one share of Orient Ltd : Rs. 3 by way of dividend and Rs. 40 by way of share price. Dividend is taxed at the rate of 15 percent and capital appreciation is taxed at 10 percent. What will be the current price of Orient Ltd's share if investors expect a post-tax return of 18 percent?

4. Omax Limited's present capital structure consists of 20 million equity shares of Rs. 10 each. It requires Rs. 100 million of additional financing. It is considering two alternatives:

Alternative 1 : Issue of 3 million equity shares of Rs. 10 par at Rs. 20 each and 4 million preference shares of Rs.10 par, carrying a dividend rate of 10 percent.

Alternative 2 : Issue of 4 million equity shares of Rs. 10 par at Rs. 20 each and debentures for Rs. 20 million carrying an interest rate of 11 percent.

The company's tax rate is 33 percent? What is the EPS-EBIT indifference point?

5. Hindustan Limited's present capital structure consists of 80 million equity shares of Rs. 10 each. It requires Rs. 100 million of additional financing. It is considering two alternatives:

Alternative 1 : Issue of 5 million equity shares of Rs. 10 par at Rs. 16 each and 2 million preference shares of Rs.10 par, carrying a dividend rate of 10 percent.

Alternative 2 : Issue of 4 million equity shares of Rs. 10 par at Rs. 16 each and debentures for Rs. 36 million carrying an interest rate of 11 percent.

The company's tax rate is 33 percent? What is the EPS-EBIT indifference point?

Chapter 24

CASH AND LIQUIDITY MANAGEMENT

1. A firm requires Rs. 10 million in cash for meeting its transaction needs over the next four months, its planning horizon for liquidity decisions. It currently has the amount in the form of marketable securities that earn 15 percent annual yield. The cash payments will be made evenly over the planning period. The conversion of marketable securities into cash entails a fixed cost of Rs. 500 per transaction. What is the optimal conversion size as per Baumol model?
2. A firm requires Rs. 20 million in cash for meeting its transaction needs over the next four months, its planning horizon for liquidity decisions. It currently has the amount in the form of marketable securities that earn 12 percent annual yield. The cash payments will be made evenly over the planning period. The conversion of marketable securities into cash entails a fixed cost of Rs. 900 per transaction. What is the optimal conversion size as per Baumol model?
3. A firm requires Rs. 50 million in cash for meeting its transaction needs over the next three months, its planning horizon for liquidity decisions. It currently has the amount in the form of marketable securities that earn 8 percent annual yield. The cash payments will be made evenly over the planning period. The conversion of marketable securities into cash entails a fixed cost of Rs. 1000 per transaction. What is the optimal conversion size as per Baumol model?
4. Pyramid Corporation expects its cash flows to behave in a random manner, as assumed by the Miller and Orr model .The following information has been gathered.
 - Annual yield on marketable securities = 9 percent
 - The fixed cost of effecting a marketable securities transaction = Rs. 5,000
 - The standard deviation of the change in daily cash balance = Rs. 30,000
 - Minimum cash balance required to be maintained as per management policy = Rs. 400,000

What is the upper control point? Assume 360 days to a year

5. Jawan Corporation expects its cash flows to behave in a random manner, as assumed by the Miller and Orr model .The following information has been gathered.
 - Annual yield on marketable securities = 18 percent
 - The fixed cost of effecting a marketable securities transaction = Rs. 1,000
 - The standard deviation of the change in daily cash balance = Rs. 2,000
 - Minimum cash balance required to be maintained as per management policy = Rs. 500,000

(a) What is the upper control point? Assume 360 days to a year

Chapter 25
CREDIT MANAGEMENT

1. Kiran is wondering whether credit should be granted to a new customer who is expected to make a repeat purchase. On the basis of credit evaluation, he feels that the probability that the customer will pay is 0.75 and the probability that the customer will default is 0.25. Once the customer pays for the first purchase, the probability that he will pay for the repeat purchase increases to 0.90. The revenue from the sale will be Rs. 150,000 and the cost of the sale will be Rs. 100,000 – these figures apply to both the initial and the repeat purchase.

What is the expected payoff if the credit is granted?

2. You are wondering whether credit should be granted to a new customer who is expected to make a repeat purchase. On the basis of credit evaluation, you feel that the probability that the customer will pay is 0.72 and the probability that the customer will default is 0.28. Once the customer pays for the first purchase, the probability that he will pay for the repeat purchase increases to 0.92. The revenue from the sale will be Rs. 100,000 and the cost of the sale will be Rs. 70,000 – these figures apply to both the initial and the repeat purchase.

What is the expected payoff if the credit is granted?

3. You are wondering whether credit should be granted to a new customer who is expected to make a repeat purchase. On the basis of credit evaluation, you feel that the probability that the customer will pay is 0.6 and the probability that the customer will default is 0.4. Once the customer pays for the first purchase, the probability that he will pay for the repeat purchase increases to 0.95. The revenue from the sale will be Rs. 600,000 and the cost of the sale would be Rs. 400,000 – these figures apply to both the initial and the repeat purchase.

What is the expected payoff if the credit is granted?

4. Jesco Ltd. presently has an annual turnover of Rs. 800 million and an average collection period of 20 days. The marketing director of the company believes that a longer credit period will stimulate additional sales. Of course, it is likely to be accompanied by higher bad debts. Extending the credit period is expected to increase sales by Rs. 100 million, lengthen the average collection period to 30 days, and increase the bad debts percentage to 2% (from the current level of 1%). The selling price of the product is Rs. 200 per unit and the variable cost per unit is Rs. 150. Jesco Ltd. requires a return of 20 % on its investments. Assume that a year consists of 360 days. What will be the change in residual income if the credit period is extended?

5. Bahar Ltd presently has an annual turnover of Rs. 1000 million and an average collection period of 30 days. The marketing director of the company believes that a longer credit period will stimulate additional sales. Of course, it is likely to be accompanied by higher bad debts. Extending the credit period is expected to increase sales by Rs. 200 million, lengthen the average collection period to 45 days, and increase the bad debts percentage to 3% (from the current level of 2%). The selling price of the product is Rs. 150 per unit and the variable cost per unit is Rs. 120. Bahar Limited requires a return of 20 % on its investments. Assume that a year consists of 360 days. What will be the change in residual income if the credit period is extended?
6. Pioneer Ltd. presently has an annual turnover of Rs. 1000 million and an average collection period of 30 days. The marketing director of the company believes that a longer credit period will stimulate additional sales. Of course, it is likely to be accompanied by higher bad debts. Extending the credit period is expected to increase sales by Rs. 200 million, lengthen the average collection period to 45 days, and increase the bad debts percentage to 3% (from the current level of 2%). The selling price of the product is Rs. 500 per unit and the variable cost per unit is Rs. 400. Pioneer Ltd. requires a return of 30 % on its investments. Assume that a year consists of 360 days. What will be the change in residual income if the credit period is extended?
7. Super Sales Limited's current sales are Rs. 300 million, its average collection period is 25 days, its variable cost to sales ratio, V , is 0.73, and its cost of capital is 13 percent. Its tax rate is 32.8 percent.
 - (i) If Super Sales Limited relaxes its credit standards, its sales would increase by Rs. 60 million on which bad debt losses will be 5 percent. What will be the effect of relaxing the credit standards on residual income?
 - (ii) The present credit terms of Super Sales are 2/15, net 30. The proportion of sales on which customers currently take discount, is 0.2. Super Sales is considering relaxing its credit terms to 3/15, net 45. Such a relaxation is expected to increase sales by Rs.70 million, increase the proportion of discount sales to 0.3, and reduce the ACP to 20 days.

What will be the effect of this on residual income?

Chapter 26
INVENTORY MANAGEMENT

- 1 The finance department of Majestic Ltd. has gathered the following information:

Annual sales	=	100,000 units
Fixed cost per order	=	Rs. 8,000
Purchase price per unit	=	Rs. 60
Carrying cost	=	15 % of inventory value

What is the Economic Order Quantity?

2. The finance department of Hero Ltd. has gathered the following information:

Annual sales	=	600,000 units
Fixed cost per order	=	Rs. 30,000
Purchase price per unit	=	Rs. 500
Carrying cost	=	20% of inventory value

What is the Economic Order Quantity?

Chapter 27

WORKING CAPITAL FINANCING

1. The credit terms are 1/10, net 20. What is the cost of the trade credit?
2. The credit terms are 2/20, net 45 . What is the cost of the trade credit?

Chapter 23
WORKING CAPITAL POLICY

1. The following information is available for Jai Hind Limited.

Profit and Loss Account Data		Balance Sheet Data		
		<i>Beginning of</i>	20X9	<i>End of 20X9</i>
Sales	200,000	Inventory	6400	6100
Cost of goods sold	126,000	Accounts receivable	5500	5800
		Accounts payable	4300	4500

What is the duration of the cash cycle?

2. The following information is available for Apar Limited.

Profit and Loss Account Data		Balance Sheet Data		
		<i>Beginning of</i>	20X8	<i>End of 20X8</i>
Sales	20,000	Inventory	1800	160
Cost of goods sold	14,000	Accounts receivable	1000	1200
		Accounts payable	700	780

What is the duration of the cash cycle?

3. The following information is available for a firm.

Profit and Loss Account Data		Balance Sheet Data		
		<i>Beginning of</i>	2009	<i>End of 2009</i>
Sales	800,000	Inventory	20,000	24,000
Cost of goods sold	540,000	Accounts receivable	80,000	95,000
		Accounts payable	52,000	43,000

What is the duration of the cash cycle?

Chapter 28

WORKING CAPITAL MANAGEMENT: EXTENSIONS

1. You are the credit manager at Acme Home Needs, a large departmental store. You believe that net profit margin and debt equity are two good indicators that can be used to discriminate between good and bad accounts. A 'good' account is an account which pays within the stipulated credit period and a 'bad' account is an account which does not pay within the stipulated credit period. You have gathered information on 18 accounts, 10 'good' and 8 'bad', which is given below.

<i>Account Number</i>	<i>Good Accounts</i>		<i>Account Number</i>	<i>Bad Accounts</i>	
	<i>Net profit margin (%)</i>	<i>Debt equity ratio</i>		<i>Net profit margin</i>	<i>Debt equity ratio</i>
1	30	1.2	11	20	1.4
2	25	1.0	12	12	1.0
3	20	0.6	13	6	0.8
4	10	0.3	14	8	0.7
5	22	1.0	15	5	0.5
6	16	0.7	16	10	0.9
7	11	0.4	17	11	1.2
8	18	0.5	18	8	0.5
9	22	0.8			
10	15	0.4			

Derive the discriminant function which best discriminates between the 'good' and the 'bad' accounts?

2. You are the credit manager at R K Retail who believes that current ratio and interest coverage ratio are two good indicators that can be used to discriminate between good and bad accounts. A 'good' account is an account which pays within the stipulated credit period and a 'bad' account is an account which does not pay within the stipulated credit period. You have gathered information on 18 accounts, 10 'good' and 8 'bad', which is given below.

<i>Account Number</i>	<i>Good Accounts</i>		<i>Account Number</i>	<i>Bad Accounts</i>	
	Current ratio	Interest coverage ratio		Current ratio	Interest coverage ratio
1	1.45	8.2	11	0.81	4.1
2	1.38	7.4	12	0.80	3.5
3	1.25	5.6	13	1.15	3
4	1.15	6.5	14	0.98	2.8
5	1.10	7	15	1.20	2.5
6	1.00	5.8	16	1.10	2.1
7	0.96	6.2	17	1.00	1.8
8	0.92	8.5	18	1.06	1.2
9	0.90	7.5			
10	0.86	6.9			

Derive the discriminant function which best discriminates between the 'good' and the 'bad' accounts?

3. You are the credit manager at Super Mega Stores. From your past experience you believe that debt equity ratio and net profit margin are two good indicators that can be used to discriminate between good and bad accounts. A 'good' account is an account which pays within the stipulated credit period and a 'bad' account is an account which does not pay within the stipulated credit period. You have gathered information on 18 accounts, 10 'good' and 8 'bad', which is given below.

<i>Account Number</i>	<i>Good Accounts</i>		<i>Account Number</i>	<i>Bad Accounts</i>	
	Debt equity ratio	Net profit margin (%)		Debt equity ratio	Net profit margin
1	0.85	30	11	0.80	12
2	0.80	18	12	1.10	12
3	0.75	16	13	1.00	15
4	0.70	14	14	0.70	12
5	0.65	15	15	1.20	10
6	0.65	22	16	1.50	9
7	0.55	12	17	0.90	8
8	0.45	10	18	1.30	14
9	0.50	18			
10	0.30	8			

Derive the discriminant function which best discriminates between the 'good' and the 'bad' accounts?

Chapter 29
Debt Analysis and Management

1. Consider the following data for government securities:

<i>Face value</i>	<i>Interest rate</i>	<i>Maturity (years)</i>	<i>Current price</i>
Rs. 100,000	0	1	92,590
Rs. 100,000	8.5 %	2	98,800
Rs. 100,000	9.0 %	3	98,000

What is the forward rate for year 3(r_3)?

2. Consider the following data for government securities:

<i>Face value</i>	<i>Interest rate</i>	<i>Maturity (years)</i>	<i>Current price</i>
Rs. 100,000	0	1	Rs 93,800
Rs. 100,000	4 %	2	Rs 95,000
Rs. 100,000	5 %	3	Rs 97,000

What is the forward rate for year 3(r_3)?

3. Consider the following data for government securities:

<i>Face value</i>	<i>Interest rate</i>	<i>Maturity (years)</i>	<i>Current price</i>
Rs. 100,000	0	1	94,000
Rs. 100,000	5 %	2	96,500
Rs. 100,000	6 %	3	97,000

What is the forward rate for year 3(r_3)?

4. Mukund Corporation has a Rs. 2000 million, 14 percent (coupon rate) bond issue outstanding which has a residual maturity of 6 years. The bonds were issued 4 years ago at par for Rs. 2000 million and Mukund incurred floatation costs of Rs. 100 million which were being amortised for tax purposes at the rate of Rs. 10 million per year. If the bonds are called, the unamortised portion of the floatation costs (Rs. 60 million) can be deducted for tax purposes. Mukund's tax rate is 33 percent. Mukund can call the bonds for Rs. 2200 million. Assume that the call premium of Rs. 200 million can be treated as a tax-deductible expense.

Mukund has been advised by its merchant bankers that due to fall in interest rates, the firm can issue Rs. 2000 million of new debt at an interest rate of 10 percent and use the proceeds for refunding the old bonds. The new issue will have a maturity of 6 years and involve a floatation cost of Rs. 72 million, which can be amortised in 6 equal annual installments for tax purposes.

- (i) What will be the initial outlay?
- (ii) What will be the annual net cash savings?

(iii) What is the NPV of refunding the bond? Give the answer correct to the nearest million.

5. Radiant Ltd. has a Rs. 1000 million, 10 percent (coupon rate) bond issue outstanding which has a residual maturity of 3 years. The bonds were issued 4 years ago at par for Rs. 1000 million and Radiant incurred floatation costs of Rs. 35 million which were being amortised for tax purposes at the rate of Rs. 5 million per year. If the bonds are called, the unamortised portion of the floatation costs (Rs. 15 million) can be deducted for tax purposes. Radiant's tax rate is 33 percent. Radiant can call the bonds for Rs. 1100 million. Assume that the call premium of Rs. 100 million can be treated as a tax-deductible expense.

Radiant has been advised by its merchant bankers that due to fall in interest rates, the firm can issue Rs. 1000 million of new debt at an interest rate of 7 percent and use the proceeds for refunding the old bonds. The new issue will have a maturity of 3 years and involve a floatation cost of Rs. 18 million, which can be amortised in 3 equal annual installments for tax purposes.

- (i) What will be the initial outlay?
- (ii) What will be the annual net cash savings?
- (iii) What is the NPV of refunding the bond? Give the answer correct to the nearest million.

6. Acme Corporation has a Rs. 4000 million, 12 percent (coupon rate) bond issue outstanding which has a residual maturity of 5 years. The bonds were issued 3 years ago at par for Rs. 4000 million and Acme incurred floatation costs of Rs. 200 million which were being amortised for tax purposes at the rate of Rs. 25 million per year. If the bonds are called, the unamortised portion of the floatation costs (Rs. 125 million) can be deducted for tax purposes. Acme's tax rate is 32 percent. Acme can call the bonds for Rs. 4300 million. Assume that the call premium of Rs. 300 million can be treated as a tax-deductible expense.

Acme has been advised by its merchant bankers that due to fall in interest rates, the firm can issue Rs. 4000 million of new debt at an interest rate of 8 percent and use the proceeds for refunding the old bonds. The new issue will have a maturity of 5 years and involve a floatation cost of Rs. 250 million, which can be amortised in 5 equal annual installments for tax purposes.

- (i) What will be the initial outlay?
- (ii) What will be the annual net cash savings?
- (iii) What is the NPV of refunding the bond? Give the answer correct to the nearest million.

Chapter 30

LEASING, HIRE PURCHASE, AND PROJECT FINANCE

1. Deepak Associates has decided to go for a plant costing Rs. 100 million. They are considering two alternatives: (i) leasing the plant, and (ii) borrowing and purchasing the plant. Premier Leasing is willing to lease the plant to Deepak Associates for an annual lease rental of Rs. 30 million for 5 years, the lease rental being payable at the end of each year. There is a management fees of Rs. 0.5 million payable on signing the lease contract.

The tax relevant depreciation rate on the plant is 25 percent as per the WDV method. The net salvage value of the plant after five years is expected to be Rs.30 million. Deepak Associates has an effective tax rate of 32 percent and its post- tax cost of debt is 12 percent.

What is the net advantage of leasing (NAL) for Deepak Associates?

2. Techno Limited has decided to go for a machine costing Rs. 4 million. Techno is considering two alternatives: (i) leasing the machine, and (ii) borrowing and purchasing the machine. Comfort Leasing is willing to lease the machine to Techno for an annual lease rental of Rs. 1.2 million for 5 years, the lease rental being payable in arrears. There is a management fees of Rs. 0.16 million payable on signing the lease contract.

The tax relevant depreciation rate on the machine is 20 percent as per the WDV method. The net salvage value of the machine after five years is expected to be Rs.1 million. Techno has an effective tax rate of 30 percent and its post-tax cost of debt is 9 percent.

What is the net advantage of leasing (NAL) for Techno Limited?

3. Riyaz Limited has decided to go for a plant costing Rs. 60 million. Riyaz is considering two alternatives: (i) leasing the plant, and (ii) borrowing and purchasing the plant. Bright Leasing is willing to lease the plant to Riyaz for an annual lease rental of Rs. 18 million for 5 years, the lease rental being payable at the end of each year. There is a management fees of Rs. 0.1 million payable on signing the lease contract.

The tax relevant depreciation rate on the plant is 20 percent as per the WDV method. The net salvage value of the plant after five years is expected to be Rs.10 million. Riyaz has an effective tax rate of 33 percent and its post- tax cost of debt is 13 percent.

What is the net advantage of leasing (NAL) for Riyaz I Limited?

4. Vijay Limited has decided to go for a machine costing Rs. 10 million. Vijay is considering two alternatives: (i) leasing the machine, and (ii) borrowing and purchasing the machine. Mega Leasing is willing to lease the machine to Vijay for an annual lease rental of Rs. 3 million fo*-r 5 years, the lease rental being

payable in arrears. There is a management fees of Rs. 0.5 million payable on signing the lease contract.

The tax relevant depreciation rate on the machine is 25 percent as per the WDV method. The net salvage value of the machine after five years is expected to be Rs.3 million. Vijay has an effective tax rate of 32 percent and its post- tax cost of debt is 8 percent.

What is the net advantage of leasing (NAL) for Vijay Limited?

5. Bimal Limited has decided to go for a plant costing Rs. 10 million. Bimal is considering two alternatives: (i) leasing the plant, and (ii) borrowing and purchasing the plant. New Era Leasing is willing to lease the plant to Bimal for an annual lease rental of Rs. 3 million for 5 years, the lease rental being payable at the end of each year. There is a management fees of Rs. 0.15 million payable on signing the lease contract.

The tax relevant depreciation rate on the plant is 25 percent as per the WDV method. The net salvage value of the plant after five years is expected to be Rs.4 million. Bimal has an effective tax rate of 32 percent and its post- tax cost of debt is 12 percent.

What is the net advantage of leasing (NAL) for Bimal I Limited?

Chapter 32
CORPORATE VALUATION

1. The profit and loss account and balance sheet of a company for two years (1 and 2) are given below. Assume a tax rate of 32 percent for year 2.

Profit and Loss Account	1	2
• Net sales	35,000	39,000
• Income from marketable securities	800	860
• Non-operating income	500	650
• Total income	36,300	40,510
• Cost of goods sold	25,400	28,000
• Selling and administrative expenses	2,000	2,600
• Depreciation	3,200	3,000
• Interest expenses	600	680
• Total costs and expenses	31,200	34,280
• PBT	5,100	6,230
• Tax provision	1,632	1,994
• PAT	3,468	4,236
• Dividends	600	600
• Retained earnings	2,868	3,636
Balance Sheet		
• Equity capital	5,000	5,000
• Reserves and surplus	12,000	15,636
• Debt	8,000	8,800
	25,000	29,436
• Fixed Assets	12,000	12,236
• Investments (marketable securities)*	6,000	8,000
• Net current assets	7,000	9,200
	25,000	29,436
* All of this represents excess marketable securities		

- (i) What is the EBIT for year 2?
(ii) What is the tax on EBIT for year 2?
(iii) What is the FCF for year 2?
(iv) What is the break-up of the financing flow?

2. The profit and loss account and balance sheet of a company for two years (1 and 2) are given below. Assume a tax rate of 32 percent for year 2.

Profit and Loss Account	1	2
• Net sales	100,000	120,000
• Income from marketable securities	260	400
• Non-operating income	2,400	3,000
• Total income	102,660	123,400
• Cost of goods sold	62,000	76,000
• Selling and administrative expenses	13,000	15,000
• Depreciation	11,000	12,000
• Interest expenses	3,000	3,600
• Total costs and expenses	89,000	106,600
• PBT	13,660	16,800
• Tax provision	4,100	5,040
• PAT	9,560	11,760
• Dividends	2,000	1,500
• Retained earnings	7,560	10,260
Balance Sheet		
• Equity capital	13,000	13,000
• Reserves and surplus	38,000	48,260
• Debt	25,000	28,000
	76,000	89,260
• Fixed Assets	56,000	68,000
• Investments (marketable securities)*	1,000	1,000
• Net current assets	19,000	20,260
	76,000	89,260
* All of this represents excess marketable securities		

- (i) What is the EBIT for year 2?
(ii) What is the tax on EBIT for year 2?
(iii) What is the FCFF for year 2?
(iv) What is the break-up of the financing flow?
3. **Free Cash Flow to Firm** The profit and loss account and balance sheet of a company for two years (1 and 2) are given below. Assume a tax rate of 30 percent for year 2.

Profit and Loss Account	1	2
• Net sales	73,000	92,000
• Income from marketable securities	900	1,000
• Non-operating income	1,000	1,200
• Total income	74,900	94,200
• Cost of goods sold	43,800	55,000
• Selling and administrative expenses	9,200	11,000
• Depreciation	8,000	8,200
• Interest expenses	2,100	2,800
• Total costs and expenses	63,100	77,000
• PBT	11,800	17,200
• Tax provision	3,540	5,160
• PAT	8,260	12,040
• Dividends	1,000	1,000
• Retained earnings	7,260	11,040
Balance Sheet		
• Equity capital	9,200	9,200
• Reserves and surplus	27,000	38,040
• Debt	18,000	19,000
	54,200	66,240
• Fixed Assets	33,000	41,000
• Investments (marketable securities)*	7,600	8,030
• Net current assets	13,600	17,210
	54,200	66,240
* All of this represents excess marketable securities		

- (i) What is the EBIT for year 2?
- (ii) What is the tax on EBIT for year 2?
- (iii) What is the FCF for year 2?
- (iv) What is the break-up of the financing flow?

4. NRF Limited proposes to acquire the rubber division of Konkan Agro Limited at the end of the current year which is 2009. In the beginning of 2009, the rubber division was having an asset value of Rs. 160 million and the same is expected to grow at a rate of 25 percent for the first three years, 15 percent for the next two years and ten percent thereafter. The ratio of NOPAT each year to the asset value at the beginning of that year would be 0.3. The opportunity cost of capital for the proposed purchase is 20 %. What will be the value of this acquisition?

Round-off your answer to the nearest million.

5. It is the beginning of 2009 and Minar Exports is evaluating a project to acquire the rubber division of Malwa Tyres at the end of the year. At present the rubber division is having an asset value of Rs. 100 million and the same is

expected to grow at a rate of 25 percent for the first two years, 15 percent for the next two years and 10 percent thereafter. The ratio of NOPAT each year to the asset value at the beginning of that year would be 0.2. The opportunity cost of capital for the proposed purchase is 18 %. What will be the value of this acquisition?

Workout your answer correct to the nearest million.

6. It is the beginning of 2010 and Konkan Industries is evaluating a project to acquire the textile division of JP Corporation at the end of the year. At present the textile division is having an asset value of Rs. 400 million and the same is expected to grow at a rate of 30 percent for the first two years, 20 percent for the next two years and 8 percent thereafter. The ratio of NOPAT each year to the asset value at the beginning of that year would be 0.3. The opportunity cost of capital for the proposed purchase is 20 %. What will be the value of this acquisition?

Workout your answer correct to the nearest million.

7. Silverman Ltd, an investment banking firm, is engaged in valuing Brandz, a firm that specialises in manufacturing lifestyle garments. Brandz is poised to grow at a rapid rate for the next four years, thanks to some large orders received recently. Thereafter, the growth rate is expected to decline steadily for a few years settling down at a modest level.

As a financial analyst working at Silverman, you have been asked to value Brandz. After discussing with the management of Brandz and consulting several experts in the industry, you have assembled the following information.

<i>Base Year (Year 0) Information</i>	
• Revenues	= Rs. 600 crore
• EBIT (25% of revenues)	= Rs. 150 crore
• Capital expenditure	= Rs. 75 crore
• Depreciation and amortisation	= Rs. 60 crore
• Working capital as a percentage of revenues	= 20 percent
• Tax rate	= 32 percent (for all time to come)

<i>Inputs for the High Growth Period</i>	
• Length of the high growth period	= 4 years
• Growth rate in revenues, depreciation, EBIT, and capital expenditure	= 40 percent
• Working capital as a percentage of revenues	= 20 percent

• Cost of debt (pre-tax)	= 13 percent
• Debt-equity ratio	= 2:1
• Risk-free rate	= 8 percent
• Market risk premium	= 9 percent
• Equity beta	= 1.8

<i>Inputs for the Transition Period</i>	
• Length of the transition period	5 years
• Growth rate in revenues, depreciation, EBIT and capital expenditures will decline linearly from 40 percent in year 4 to 10 percent in year 9.	
• Working capital as a percentage of revenues	= 20 percent
• The cost of debt, debt-equity ratio, risk-free rate, market risk premium and equity beta will be the same as in high growth period	

<i>Inputs for the Stable Growth Period</i>	
• Growth rate in revenues, EBIT, capital expenditure and depreciation	= 10 percent
• Working capital as a percentage of revenues	= 20 percent
• The cost of debt, risk-free rate and market risk premium will be the same as in the previous stages.	
• Debt-equity ratio	= 1.4 : 1
• Equity beta	= 1.2

Required:

- What is the cost of capital in the three periods: high growth, transition, and stable?
- What value would you impute to Brandz using the DCF method?

8. Globinvest, an investment banking firm, is engaged in valuing Neo Fabs, a firm that specialises in manufacturing fashion garments. Neo is poised to grow at a rapid rate for the next five years, thanks to some large orders received recently. Thereafter, the growth rate is expected to decline steadily for a few years settling down at a modest level.

As a financial analyst working at Globinvest, you have been asked to value Neo. After discussing with the management of Neo and consulting several experts in the industry, you have assembled the following information.

<i>Base Year (Year 0) Information</i>	
• Revenues	= Rs. 800 crore
• EBIT (20% of revenues)	= Rs. 160 crore
• Capital expenditure	= Rs. 100 crore
• Depreciation and amortisation	= Rs. 80 crore
• Working capital as a percentage of revenues	= 30 percent
• Tax rate	= 32 percent (for all time to come)

<i>Inputs for the High Growth Period</i>	
• Length of the high growth period	= 4 years
• Growth rate in revenues, depreciation, EBIT, and capital expenditure	= 50 percent
• Working capital as a percentage of revenues	= 30 percent
• Cost of debt (pre-tax)	= 13.5 percent
• Debt-equity ratio	= 3:2
• Risk-free rate	= 6 percent
• Market risk premium	= 8 percent
• Equity beta	= 1.6

<i>Inputs for the Transition Period</i>	
• Length of the transition period	5 years
• Growth rate in revenues, depreciation, EBIT and capital expenditures will decline linearly from 50 percent in year 4 to 10 percent in year 9.	
• Working capital as a percentage of	= 30 percent

revenues	
<ul style="list-style-type: none"> The cost of debt, debt-equity ratio, risk-free rate, market risk premium and equity beta will be the same as in high growth period 	

<i>Inputs for the Stable Growth Period</i>	
<ul style="list-style-type: none"> Growth rate in revenues, EBIT, capital expenditure and depreciation 	= 10 percent
<ul style="list-style-type: none"> Working capital as a percentage of revenues 	= 30 percent
<ul style="list-style-type: none"> The cost of debt, risk-free rate and market risk premium will be the same as in the previous stages. 	
<ul style="list-style-type: none"> Debt-equity ratio 	= 1 : 1
<ul style="list-style-type: none"> Equity beta 	= 1.1

Required:

- What is the cost of capital in the three periods: high growth, transition, and stable?
- What value would you impute to Neo Fabs using the DCF method?

Chapter 33

VALUE BASED MANAGEMENT

1. The income statement for year 0 (the year which has just ended) and the balance sheet at the end of year 0 for Apex Ltd. are as follows

Income Statement		Balance Sheet			
• Sales	48,000	Equity	20,000	Fixed assets	15,000
• Gross margin (25%)	12,000				
• SG&A expenses (10%)	4,800				
• PBT	7,200			Current assets	5,000
• Tax	2,160				
• PAT	5,040		<u>20,000</u>		<u>20,000</u>

Apex Limited is debating whether it should maintain the status quo or adopt a new strategy. If it maintains the status quo:

- The sales will remain constant at 48,000
- The gross margin will remain at 25 % and the SG&A expenses will be 10% of sales.
- Depreciation charges will be equal to new investments.
- The asset turnover ratios will remain constant.
- The discount rate will be 17 percent.
- The income tax rate will be 30 percent.

If Apex Limited adopts a new strategy, its sales will grow at a rate of 15 percent per year for three years. The margins, the turnover ratios, the capital structure, the income tax rate, and the discount rate, however, will remain unchanged. Depreciation charges will be equal to 15 percent of the net fixed assets at the beginning of the year.

Required:

- (a) What is the value of the new strategy?
2. A company earns a return on equity of 40 percent. The dividend payout ratio is 60 percent. Equity shareholders of the company require a return of 28 percent. The book value per share is Rs. 400.

- (i) What is the market price per share, according to the Marakon model?
(ii) If the return earned on equity falls to 30 percent, what should be the payout ratio to ensure that the market price per share remains unchanged?
3. A company earns a return on equity of 25 percent. The dividend payout ratio is 20 percent. Equity shareholders of the company require a return of 22 percent. The book value per share is Rs. 80.
- (i) What is the market price per share, according to the Marakon model?
(ii) If the return earned on equity falls to 23 percent, what should be the payout ratio to ensure that the market price per share remains unchanged?
4. The balance sheet of Magna Ltd. as on 31/03/20X9 is given below:

<i>Equity and Liabilities</i>		<i>Assets</i>	
Equity	400	Fixed assets (net)	500
Debt	300	Net current assets	200
	<u>700</u>		<u>700</u>

The profit and loss account for the year 1/4/20X8 – 31/3/20X9 is given below:

Revenues	1000
Cost of goods sold	600
Gross profit	400
Operating expenses	100
PBIT	300
Interest	60
Profit before tax	240
Tax	70
Profit after tax	170

Magna's equity has a beta of 0.90. The risk free return is 8 percent and the market return is 15 percent. Magna's pre-tax cost of debt is 20%. The tax rate for Magna is 30 percent. What is the EVA for 20X8–20X9?

5. The balance sheet of Optima Corporation as on 31/03/20X9 is given below:

<i>Equity and Liabilities</i>		<i>Assets</i>	
Equity	180	Fixed assets (net)	150
Debt	100	Net current assets	130
	<u>280</u>		<u>280</u>

The profit and loss account for the year 1/4/20X8 – 31/3/20X9 is given below:

Revenues	360
Cost of goods sold	210
Gross profit	150
Operating expenses	70

PBIT	80
Interest	10
Profit before tax	70
Tax	20
Profit after tax	50

Optima's equity has a beta of 0.9. The risk free return is 8 percent and the market return is 12 percent. Optima's pre-tax cost of debt is 14%. The tax rate for Optima is 30 percent. What is the EVA for 20X8–20X9?

6. The balance sheet of Dharampal Ltd. as on 31/03/2010 is given below:

<i>Equity and Liabilities</i>		<i>Assets</i>	
Equity	900	Fixed assets (net)	1000
Debt	700	Net current assets	<u>600</u>
	<u>1600</u>		<u>1600</u>

The profit and loss account for the year 1/4/2009 – 31/3/2010 is given below:

Revenues	3000
Cost of goods sold	2000
Gross profit	1000
Operating expenses	300
PBIT	700
Interest	200
Profit before tax	500
Tax	200
Profit after tax	300

Dharampal Ltd.'s equity has a beta of 1.20. The risk free return is 7 percent and the market return is 14 percent. Dharampal Ltd.'s pre-tax cost of debt is 15%. The tax rate for Dharampal Ltd. is 32 percent. What is the EVA for 2009–2010?

7. A new plant entails an investment of Rs. 1,000 million (Rs. 600 million in fixed assets and Rs. 400 million in net working capital). The plant has an economic life of 10 years and is expected to produce a NOPAT of Rs. 140 million per year. After 10 years, the net working capital will be realised at par whereas fixed assets will fetch nothing. The cost of capital for the project is 15 percent. Assume that the straight line method of depreciation is used for tax as well as reporting purposes.

- (i) What will be the ROCE for year 3? Assume that the capital employed is measured at the beginning of the year.
- (ii) What will be the EVA for year 3?
- (iii) What will be the ROGI for year 3?
- (iv) What will be the CVA for year 3?
- (v) What will be the CFROI for year 3?

8. A new plant entails an investment of Rs. 9,000 million (Rs. 6,000 million in fixed assets and Rs. 3,000 million in net working capital). The plant has an economic life of 10 years and is expected to produce a NOPAT of Rs. 1,500 million per year. After 10 years, the net working capital will be realised at par whereas fixed assets will fetch nothing. The cost of capital for the project is 15 percent. Assume that the straight line method of depreciation is used for tax as well as reporting purposes.
- (i) What will be the ROCE for year 3? Assume that the capital employed is measured at the beginning of the year.
 - (ii) What will be the EVA for year 3?
 - (iii) What will be the ROGI for year 3?
 - (iv) What will be the CVA for year 3?
 - (v) What will be the CFROI for year 3?
9. A new plant entails an investment of Rs. 5,000 million (Rs. 3,400 million in fixed assets and Rs. 1,600 million in net working capital). The plant has an economic life of 10 years and is expected to produce a NOPAT of Rs. 900 million per year. After 10 years, the net working capital will be realised at par whereas fixed assets will fetch nothing. The cost of capital for the project is 16 percent. Assume that the straight line method of depreciation is used for tax as well as reporting purposes.
- (i) What will be the ROCE for year 3? Assume that the capital employed is measured at the beginning of the year.
 - (ii) What will be the EVA for year 3?
 - (iii) What will be the ROGI for year 3?
 - (iv) What will be the CVA for year 3?
 - (v) What will be the CFROI for year 3?

Chapter 34

MERGERS, ACQUISITIONS AND RESTRUCTURING

1. Global Infosystems Ltd. Company plans to acquire GCL Tech Ltd. The following information is available.

	Global Infosystems	GCL Tech
Total earnings, E	Rs. 2000 million	Rs. 500 million
Number of outstanding shares, S	Rs. 30 million	Rs. 20 million
Market price per share	Rs. 800	Rs. 250

- (i) What is the maximum exchange ratio acceptable to the shareholders of Global Infosystems if the PE ratio of combined entity is 14 and there is no synergy gain?
- (ii) What is the minimum exchange ratio acceptable to the shareholders of GCL Tech if the PE ratio of the combined entity is 20 and there is synergy benefit of 5 percent?
- (iii) Assuming that there is no synergy, at what level of PE multiple will the lines ER_1 and ER_2 intersect?
- (iv) Assume that there is an expected synergy gain of 8 percent. What exchange ratio will result in a post-merger EPS of Rs. 70?
- (v) Now assume that the merger is expected to generate gains which have a present value of Rs. 1000 million and the exchange ratio agreed to is 0.8. What is the true cost of the merger from the point of view of Global Infosystems?

2. Megasystems Ltd. plans to acquire Minitech Ltd. The following information is available.

	Megasystems Ltd	Minitech Ltd
Total earnings, E	Rs. 8000 million	Rs. 800 million
Number of outstanding shares, S	Rs. 220 million	Rs. 30 million
Market price per share	Rs. 400	Rs. 180

- (i) What is the maximum exchange ratio acceptable to the shareholders of Megasystems Ltd if the PE ratio of combined entity is 11 and there is no synergy gain?
- (ii) What is the minimum exchange ratio acceptable to the shareholders of Minitech Ltd if the PE ratio of the combined entity is 15 and there is synergy benefit of 10 percent?
- (iii) Assuming that there is no synergy, at what level of PE multiple will the lines ER_1 and ER_2 intersect?
- (iv) Assume that there is an expected synergy gain of 5 percent. What exchange ratio will result in a post-merger EPS of Rs. 40?
- (v) Now assume that the merger is expected to generate gains which have a present value of Rs. 600 million and the exchange ratio agreed to is 0.6.

What is the true cost of the merger from the point of view of Megasystems Ltd?

3. Indsoft Systems Ltd. plans to acquire RK Tech Ltd. The following information is available.

	Indsoft Systems	RK Tech
Total earnings, E	Rs. 120 million	Rs. 80 million
Number of outstanding shares, S	Rs. 16 million	Rs. 10 million
Market price per share	Rs. 100	Rs. 20

- (i) What is the maximum exchange ratio acceptable to the shareholders of Indsoft Systems if the PE ratio of combined entity is 10 and there is no synergy gain?
- (ii) What is the minimum exchange ratio acceptable to the shareholders of RK Tech if the PE ratio of the combined entity is 12 and there is synergy benefit of 6 percent?
- (iii) Assuming that there is no synergy, at what level of PE multiple will the lines ER_1 and ER_2 intersect?
- (iv) Assume that there is an expected synergy gain of 10 percent. What exchange ratio will result in a post-merger EPS of Rs. 10?
- (v) Now assume that the merger is expected to generate gains which have a present value of Rs. 80 million and the exchange ratio agreed to is 0.7. What is the true cost of the merger from the point of view of Indsoft Systems?

Chapter 37
INTERNATIONAL FINANCIAL MANAGEMENT

1. The following quotes are seen on the screen in a dealing room.

USD/CHF spot: 1.0580 / 85 3 months swap: 8/6

- (i) What is the outright USD/CHF 3 months rate?
- (ii) What is the annualised premium/discount on USD with respect to CHF?

2. The following quotes are seen on the screen in a dealing room.

GBP/SGD spot: 2.1038 / 2.1068 6 months swap: 26/31

- (i) What is the outright GBP/SGD 6 month's rate?
- (ii) What is the annualised premium/discount on GBP with respect to SGD?

3. A German firm has a USD 100 million 30-day payable. The market rates are:

EUR/USD spot : 1.4352/53 30-day swap : 10/ 12
USD interest rate : 1.50 /1.55 EUR interest rate : 2.20 /2.25

- (i) How much will it pay if it covers the payable forward?
- (ii) What will be the outflow after 30 days if it covers via money market?

4. An Swiss firm has a USD 500 million 30-day receivable. The market rates are:

USD/CHF spot : 1.0291/95 30-day swap : 4/ 3
USD interest rate : 0.28 /0.58 CHF interest rate : 0.09 /0.24

- (i) How much will it receive if it covers the receivable forward?
- (ii) What will be the inflow after 30 days if it covers via money market?
(Consider a year to consist of 360 days in both USA and Swiss money markets)

5. An Australian firm has a USD 800 million 60-day payable. The market rates are:

AUD/USD spot : 0.8954/60 60-day swap : 20/ 12
USD interest rate : 2.00 /2.50 AUD interest rate : 3.20 /3.70

- (i) How much will it pay if it covers the payable forward?
- (ii) What will be the outflow after 60 days if it covers via money market?
(Assume 360 days for an year in both USA and Australian money markets)

Chapter 40
CORPORATE RISK MANAGEMENT

1. The historical relationship between two steel stocks, A and B has been as follows.

Percentage change in A = $0.05 + 0.7$ (Percentage change in B)

If an investor owns Rs. 14 million of A, how should he create a zero value hedge?

2. **Risk Management** The historical relationship between two steel stocks, L and M has been as follows.

Percentage change in L = $0.08 + 0.9$ (Percentage change in M)

If an investor owns Rs. 1.8 million of L, how should he create a zero value hedge?

3. **Risk Management** The historical relationship between two steel stocks, A and B has been as follows.

Percentage change in A = $0.03 + 0.8$ (Percentage change in B)

If an investor owns Rs. 10 million of A, how should he create a zero value hedge?

