

PAPER – 2 : STRATEGIC FINANCIAL MANAGEMENT

Question No. 1 is compulsory. Answer any four questions from the rest. Working notes should form part of the answer.

Question 1

- (a) Consider a two year American call option with a strike price of Rs. 50 on a stock the current price of which is also Rs. 50. Assume that there are two time periods of one year and in each year the stock price can move up or down by equal percentage of 20%. The risk free interest rate is 6%. Using binominal option model, calculate the probability of price moving up and down. Also draw a two step binomial tree showing prices and payoffs at each node. (8 Marks)

- (b) Mr. X owns a portfolio with the following characteristics:

	Security A	Security B	Risk Free security
Factor 1 sensitivity	0.80	1.50	0
Factor 2 sensitivity	0.60	1.20	0
Expected Return	15%	20%	10%

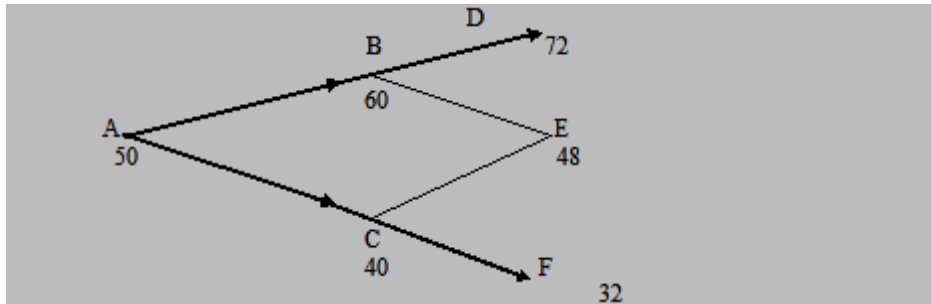
It is assumed that security returns are generated by a two factor model.

- (i) If Mr. X has Rs. 1,00,000 to invest and sells short Rs. 50,000 of security B and purchases Rs. 1,50,000 of security A what is the sensitivity of Mr. X's portfolio to the two factors?
- (ii) If Mr. X borrows Rs. 1,00,000 at the risk free rate and invests the amount he borrows along with the original amount of Rs. 1,00,000 in security A and B in the same proportion as described in part (i), what is the sensitivity of the portfolio to the two factors?
- (iii) What is the expected return premium of factor 2? (8 Marks)
- (c) The share of X Ltd. is currently selling for Rs. 300. Risk free interest rate is 0.8% per month. A three months futures contract is selling for Rs. 312. Develop an arbitrage strategy and show what your riskless profit will be 3 month hence assuming that X Ltd. will not pay any dividend in the next three months. (4 Marks)

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Answer

(a) Stock prices in the two step Binominal tree

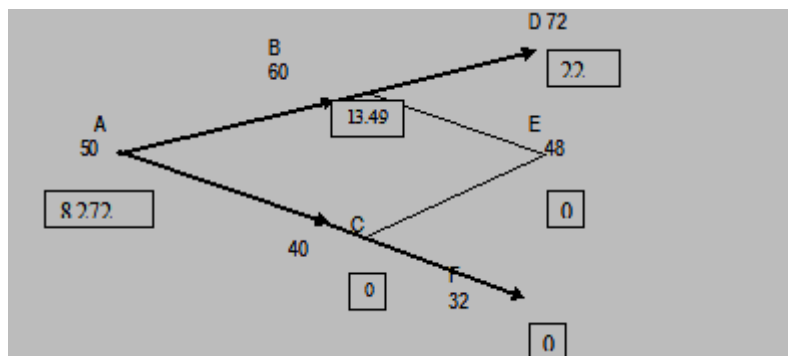


Using the single period model, the probability of price increase is

$$P = \frac{R - d}{u - d} = \frac{1.06 - 0.80}{1.20 - 0.80} = \frac{0.26}{0.40} = 0.65$$

therefore the p of price decrease = $1 - 0.65 = 0.35$

The two step Binominal tree showing price and pay off



The value of an American call option at nodes D, E and F will be equal to the value of European option at these nodes and accordingly the call values at nodes D, E and F will be 22, 0 and 0 using the single period binomial model the value of call option at node B is

$$C = \frac{C_u p + C_d (1 - p)}{R} = \frac{22 \times 0.65 + 0 \times 0.35}{1.06} = 13.49$$

At node B the payoff from early exercise will pay Rs. 10, which is less than the value calculated using the single period binomial model. Hence at node B, early exercise is not preferable and the value of American option at this node will be Rs. 13.49. If the value of

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an early exercise had been higher it would have been taken as the value of option. The value of option at node 'A' is

$$\frac{13.49 \times 0.65 + 0 \times 0.35}{1.06} = 8.272$$

- (b) (i) Mr. X's position in the two securities are +1.50 in security A and -0.5 in security B. Hence the portfolio sensitivities to the two factors:-

$$\text{b prop. 1} = 1.50 \times 0.80 + (-0.50 \times 1.50) = 0.45$$

$$\text{b prop. 2} = 1.50 \times 0.60 + (-0.50 \times 1.20) = 0.30$$

- (ii) Mr. X's current position:-

$$\text{Security A} \quad \text{Rs. 300000 / Rs. 100000} = 3$$

$$\text{Security B} \quad -\text{Rs. 100000 / Rs. 100000} = -1$$

$$\text{Risk free asset} -\text{Rs. 100000 / Rs. 100000} = -1$$

$$\text{b prop. 1} = 3.0 \times 0.80 + (-1 \times 1.50) + (-1 \times 0) = 0.90$$

$$\text{b prop. 2} = 3.0 \times 0.60 + (-1 \times 1.20) + (-1 \times 0) = 0.60$$

- (iii) The portfolio created in part (ii) is a pure factor 2 portfolio.

Expected return on the portfolio in part (b) is:

$$R_p = 3 \times 0.15 + (-1) \times 0.20 + (-1) \times 0.10$$

$$= 0.15 \text{ i.e. } 15\%$$

$$\therefore \text{Expected return premium} = 15\% - 10\%$$

$$= 5\%$$

- (c) The appropriate value of the 3 months futures contract is –

$$F_0 = \text{Rs. } 300 (1.008)^3 = \text{Rs. } 307.26$$

Since the futures price exceeds its appropriate value it pays to do the following:-

Action	Initial Cash flow	Cash flow at time T (3 months)
Borrow Rs. 300 now and repay with interest after 3 months	+ Rs. 300	- Rs.300 (1.008) ³ = - Rs. 307.26
Buy a share	- Rs. 300	ST
Sell a futures contract (F ₀ = 312/-)	<u>0</u>	<u>Rs. 312 – ST</u>
Total	<u>Rs. 0</u>	<u>Rs. 4.74</u>

Such an action would produce a risk less profit of Rs. 4.74.

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Question 2

- (a) An investor has two portfolios known to be on minimum variance set for a population of three securities A, B and C having below mentioned weights:

	WA	WB	WC
Portfolio X	0.30	0.40	0.30
Portfolio Y	0.20	0.50	0.30

It is supposed that there are no restrictions on short sales.

- (i) What would be the weight for each stock for a portfolio constructed by investing Rs. 5,000 in portfolio X and Rs. 3,000 in portfolio Y?.
- (ii) Suppose the investor invests Rs. 4,000 out of Rs. 8,000 in security A. How he will allocate the balance between security B and C to ensure that his portfolio is on minimum variance set? (6 Marks)
- (b) Calculate the value of share from the following information:

Profit of the company	Rs. 290 crores	
Equity capital of company	Rs. 1,300 crores	
Par value of share	Rs. 40 each	
Debt ratio of company	27	
Long run growth rate of the company	8%	
Beta 0.1; risk free interest rate	8.7%	
Market returns	10.3%	
Capital expenditure per share	Rs. 47	
Depreciation per share	Rs. 39	
Change in Working capital	Rs. 3.45 per share	(6 Marks)

- (c) The returns on stock A and market portfolio for a period of 6 years are as follows:

Year	Return on A (%)	Return on market portfolio (%)
1	12	8
2	15	12
3	11	11
4	2	-4
5	10	9.5
6	-12	-2

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You are required to determine:

- (i) Characteristic line for stock A
- (ii) The systematic and unsystematic risk of stock A. (8 Marks)

Answer

- (a) (i) Investment committed to each security would be:-

	<u>A</u>	<u>B</u>	<u>C</u>	<u>Total</u>
Portfolio X	Rs. 1,500	Rs. 2,000	Rs. 1,500	Rs. 5,000
Portfolio Y	Rs. 600	Rs. 1,500	Rs. 900	Rs. 3,000
Combined Portfolio	Rs. 2,100	Rs. 3,500	Rs. 2,400	Rs. 8,000
∴ Stock weights	0.26	0.44	0.30	

- (ii) The equation of critical line takes the following form:-

$$W_B = a + bW_A$$

Substituting the values of W_A & W_B from portfolio X and Y in above equation, we get

$$0.40 = a + 0.30b, \text{ and}$$

$$0.50 = a + 0.20b$$

Solving above equation we obtain the slope and intercept, $a = 0.70$ and $b = -1$ and thus, the critical line is

$$W_B = 0.70 - W_A$$

If half of the funds is invested in security A then,

$$W_B = 0.70 - 0.50 = 0.20$$

$$\text{Since } W_A + W_B + W_C = 1$$

$$W_C = 1 - 0.50 - 0.20 = 0.30$$

$$\begin{aligned} \therefore \text{Allocation of funds to security B} &= 0.20 \times 8,000 \\ &= \text{Rs. 1,600, and} \\ \text{Security C} &= 0.30 \times 8,000 \\ &= \text{Rs. 2,400} \end{aligned}$$

(b) $\text{No. of Shares} = \frac{1300}{40} = 32.5 \text{ Crores}$

$$\text{EPS} = \frac{\text{PAT}}{\text{No. of shares}}$$

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$$EPS = \frac{290}{32.5} = \text{Rs. } 8.923$$

$$FCFE = \text{Net income} - [(1-b) (\text{capex} - \text{dep}) + (1-b) (\Delta WC)]$$

$$\begin{aligned} FCFE &= 8.923 - [(1-0.27) (47-39) + (1-0.27) (3.45)] \\ &= 8.923 - [5.84 + 2.5185] \\ &= 0.5645 \end{aligned}$$

$$\begin{aligned} \text{Cost of Equity} &= R_f + \beta (R_m - R_f) \\ &= 8.7 + 0.1 (10.3 - 8.7) \\ &= 8.86\% \end{aligned}$$

$$P_0 = \frac{FCFE(1+g)}{K_e - g} = \frac{0.5645(1.08)}{0.0886 - .08} = \frac{0.60966}{0.0086} = \text{Rs. } 70.89$$

(c) Characteristic line is given by

$$\alpha_i + \beta_i R_m$$

$$\beta_i = \frac{\sum xy - n \bar{x} \bar{y}}{\sum x^2 - n(\bar{x})^2}$$

$$\alpha_i = \bar{y} - \beta \bar{x}$$

Return on A (Y)	Return on market (X)	xy	x ²	(x - $\bar{x}$)	(x - $\bar{x}$) ²	(y - $\bar{y}$)	(y - $\bar{y}$) ²
12	8	96	64	2.25	5.06	5.67	32.15
15	12	180	144	6.25	39.06	8.67	75.17
11	11	121	121	5.25	27.56	4.67	21.81
2	-4	-8	16	-9.75	95.06	-4.33	18.75
10	9.5	95	90.25	3.75	14.06	3.67	13.47
<u>-12</u>	<u>-2</u>	<u>24</u>	<u>4</u>	<u>-7.75</u>	<u>60.06</u>	<u>-18.33</u>	<u>335.99</u>
38	34.5	508	439.25		240.86		497.34

$$\bar{y} = \frac{38}{6} = 6.33$$

$$\bar{x} = \frac{34.5}{6} = 5.75$$

$$\beta_i = \frac{\sum xy - n \bar{x} \bar{y}}{\sum x^2 - n(\bar{x})^2} = \frac{508 - 6(5.75)(6.33)}{439.25 - 6(5.75)^2} = \frac{508 - 218.385}{439.25 - 198.375}$$

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$$= \frac{289.615}{240.875} = 1.202$$

$$\alpha = \bar{y} - \beta \bar{x} = 6.33 - 1.202 (5.75) = -0.58$$

Hence the characteristic line is $-0.58 + 1.202 (R_m)$

$$\text{Total Risk of Market} = \sigma_{m^2} = \frac{\sum(x - \bar{x})^2}{x - 1} = \frac{240.86}{5} = 48.17(\%)$$

$$\text{Total Risk of Stock} = \frac{497.34}{5} = 99.47 (\%)$$

$$\text{Systematic Risk} = \beta^2 \sigma_{m^2} = (1.202)^2 \times 48.17 = 69.59(\%)$$

$$\begin{aligned} \text{Unsystematic Risk is} &= \text{Total Risk} - \text{Systematic Risk} \\ &= 99.47 - 69.59 = 29.88(\%) \end{aligned}$$

Question 3

- (a) M/s Gama & Co. is planning of installing a power saving machine and are considering buying or leasing alternative. The machine is subject to straight-line method of depreciation. Gama & Co. can raise debt at 14% payable in five equal annual instalments of Rs. 1,78,858 each, at the beginning of the year. In case of leasing, the company would be required to pay an annual end of year rent of 25% of the cost of machine for 5 years.

The Company is in 40% tax bracket. The salvage value is estimated at Rs. 24,998 at the end of 5 years.

Evaluate the two alternatives and advise the company by considering after tax cost of debt concept under both alternatives.

P.V. factors 0.9225, 0.8510, 0.7851, 0.7242, 0.6681 respectively for 1 to 5 years.

(12 Marks)

- (b) ABC Ltd. has Rs. 300 million, 12 per cent bonds outstanding with six years remaining to maturity. Since interest rates are falling, ABC Ltd. is contemplating of refunding these bonds with a Rs. 300 million issue of 6 year bonds carrying a coupon rate of 10 per cent. Issue cost of the new bond will be Rs. 6 million and the call premium is 4 per cent. Rs. 9 million being the unamortized portion of issue cost of old bonds can be written off no sooner the old bonds are called off. Marginal tax rate of ABC Ltd. is 30 per cent. You are required to analyse the bond refunding decision. (6 Marks)
- (c) Mr. X earns 10% on his investments in equity shares. He is considering a recently floated scheme of a Mutual Fund where the initial expenses are 6% and annual recurring

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expensed are expected to be 2%. How much the Mutual Fund scheme should earn to provide a return of 10% to Mr. X? (2 Marks)

Answer

(a)

CALCULATION OF COST OF THE MACHINE

Year	Cl. Balance at the beginning	Installment	Interest	Principal component
5	0	1,78,858	21,965	1,56,893
4	1,56,893	1,78,858	41,233	1,37,625
3	2,94,518	1,78,858	58,134	1,20,724
2	4,15,242	1,78,858	72,960	1,05,898
1	5,21,140	1,78,858	0	<u>1,78,858</u>
		Total		<u>6,99,998</u>

Cost of the machine is Rs. 6,99,998

Buying Option

Depreciation p.a. = Rs. 6,99,998- Rs. 24,998

5

Depreciation p.a. = Rs. 1,35,000

Tax Saving on interest & Depreciation

Year	Interest (Rs.)	Dep. (Rs.)	Total (Rs.)	Tax Saving (Rs.)
1	72,960	1,35,000	2,07,960	83,184
2	58,134	1,35,000	1,93,134	77,254
3	41,233	1,35,000	1,76,233	70,493
4	21,965	1,35,000	1,56,965	62,786
5	0	1,35,000	1,35,000	54,000

P.V. Out flow

Year	Installment (Rs.)	Tax Saving (Rs.)	Net outflow (Rs.)	PV @8.4%	P.V. (Rs.)
0	1,78,858	0	1,78,858	1.000	1,78,858.00
1	1,78,858	83,184	95,674	0.9225	88,259.00
2	1,78,858	77,254	1,01,604	0.851	86,465.00
3	1,78,858	70,493	1,08,365	0.7851	85,077.00
4	1,78,858	62,786	1,16,072	0.7242	84,059.00

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5	54,000	-54,000	0.6681	<u>-36,077.00</u>
				4,86,641.00
	Salvage Value	24,998	0.6681	<u>16,701.00</u>
	P.V. of Outflow			<u>4,69,940.00</u>

Leasing Option

Lease Rent 25% of Rs. 6,99,998 i.e. Rs. 1,74,999.50 app. Rs. 1,75,000

Lease Rent payable at the end of the year

Year	Lease Rental (Rs.)	Tax Saving (Rs.)	Net outflow (Rs.)	PV @8.4%	P.V. (Rs.)
1-5	1,75,000	70,000	1,05,000	3.9509	4,14,844.50

Decision – The company is advised to opt for leasing as the total PV of cash outflow is lower by Rs. 55,095.50

(b)

1. Calculation of initial outlay:-

	Rs. (million)
a. Face value	300
Add:-Call premium	<u>12</u>
Cost of calling old bonds	312
b. Gross proceed of new issue	300
Less: Issue costs	<u>6</u>
Net proceeds of new issue	294
c. Tax savings on call premium and unamortized cost 0.30 (12 + 9)	6.3
∴ Initial outlay = Rs. 312 million – Rs 294 million – Rs. 6.3 million	
= Rs. 11.7 million	

2. Calculation of net present value of refunding the bond:-

	Rs. (million)
Saving in annual interest expenses	
[300 x (0.12 – 0.10)]	6.00
Less:- Tax saving on interest and amortization	
0.30 x [6 + (9-6)/6]	<u>1.95</u>

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Annual net cash saving	<u>4.05</u>
PVIFA (7%, 6 years)	4.766
∴ Present value of net annual cash saving	= Rs. 19.30 million
Less:- Initial outlay	= <u>Rs. 11.70 million</u>
Net present value of refunding the bond	<u>Rs. 7.60 million</u>

Decision: The bonds should be refunded

(c) $r_2 = \frac{1}{1 - \text{initial exp}} \times r_1 + \text{recurring exp.}$

The rate of return the mutual fund should earn;

$$= \frac{1}{1 - 0.06} \times 0.1 + 0.02$$

$$= 0.1264 \text{ or } 12.64\%$$

Question 4

- (a) Your forex dealer had entered into a cross currency deal and had sold US \$ 10,00,000 against EURO at US \$ 1 = EUR 1.4400 for spot delivery.

However, later during the day, the market became volatile and the dealer in compliance with his management's guidelines had to square – up the position when the quotations were:

Spot US \$ 1	INR 31.4300/4500
1 month margin	25/20
2 months margin	45/35
Spot US \$ 1	EURO 1.4400/4450
1 month forward	1.4425/4490
2 months forward	1.4460/4530

What will be the gain or loss in the transaction?

(6 Marks)

- (b) On 19th April following are the spot rates

Spot EUR/USD 1.20000 USD/INR 44.8000

Following are the quotes of European Options:

Currency Pair	Call/Put	Strike Price	Premium	Expiry date
EUR/USD	Call	1.2000	\$ 0.035	July 19
EUR/USD	Put	1.2000	\$ 0.04	July 19

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USD/INR	Call	44.8000	Rs. 0.12	Sep. 19
USD/INR	Put	44.8000	Rs. 0.04	Sep. 19

- (i) A trader sells an at-the-money spot straddle expiring at three months (July 19).
Calculate gain or loss if three months later the spot rate is EUR/USD 1.2900.
- (ii) Which strategy gives a profit to the dealer if five months later (Sep. 19) expected spot rate is USD/INR 45.00. Also calculate profit for a transaction USD 1.5 million.

(8 Marks)

- (c) You have following quotes from Bank A and Bank B:

	Bank A	Bank B
SPOT	USD/CHF 1.4650/55	USD/CHF 1.4653/60
3 months	5/10	
6 months	10/15	
SPOT	GBP/USD 1.7645/60	GBP/USD 1.7640/50
3 months	25/20	
6 months	35/25	

Calculate :

- (i) How much minimum CHF amount you have to pay for 1 Million GBP spot?
- (ii) Considering the quotes from Bank A only, for GBP/CHF what are the Implied Swap points for Spot over 3 months?

(6 Marks)

Answer

- (a) 1 The amount of EUR bought by selling USD
 $10,00,000 \times 1.4400 = \text{EUR } 14,40,000$
- 2 The amount of EUR sold for buying USD
 $10,00,000 \times 1.4450 = \underline{\text{EUR } 14,45,000}$
- 3 Net Loss in the Transaction = EUR 5,000

To acquire EUR 5,000 from the market @

(a) USD 1 = EUR 1.4400 &

(b) USD1 = INR 31.4500

Cross Currency buying rate of EUR/INR is

Rs. 31.4500 / 1.440 i.e. Rs. 21.8403

Loss in the Transaction Rs. 21.8403 * 5000 = Rs. 1,09,201.50

- (b) (i) Straddle is a portfolio of a CALL & a PUT option with identical Strike Price. A trader sells Straddle of At the Money Straddle will be selling a Call option & a put option with Strike Price of USD per EUR.

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He will receive premium of \$ 0.035 + \$ 0.040 = \$ 0.075

At the expiry of three months Spot rate is 1.2900 i.e. higher than Strike Price Hence, Buyer of the Call option will exercise the option, but buyer of Put option will allow the option to lapse.

Profit or Loss to a trader is

Premium received	\$0.075
Loss on call option exercised $1.2900 - 1.2000$	\$0.090
Net Loss of	\$ 0.015 per EUR

(ii) BUY Strategy i.e. either Call or Put

Price is expected to go up then call option is beneficial.

On 19th April to pay Premium 15,00,000 @ Rs. 0.12 i.e. INR 1,80,000

On 19th September exercise call option to gain 15,00,000 @ Rs. 0.20 INR 3,00,000

INR 1,20,000

(c) (i) To BUY 1 Million GBP Spot against CHF

1. First to BUY USD against CHF at the cheaper rate i.e. from Bank A.

1 USD = CHF 1.4655

2. Then to BUY GBP against USD at a cheaper rate i.e. from Bank B

1 GBP = USD 1.7650

By applying chain rule Buying rate would be

1 GBP = 1.7650×1.4655 CHF

1 GBP = CHF 2.5866

Amount payable CHF 2.5866 Million or CHF 25,86,600

(ii) Spot rate Bid rate GBP 1 = CHF 1.4650×1.7645 = CHF 2.5850

Offer rate GBP 1 = CHF 1.4655×1.7660 = CHF 2.5881

GBP / USD 3 months swap points are at discount

Outright 3 Months forward rate GBP 1 = USD $1.7620 / 1.7640$

USD / CHF 3 months swap points are at premium

Outright 3 Months forward rate USD 1 = CHF $1.4655 / 1.4665$

Hence

Outright 3 Months forward rate GBP 1 = CHF $2.5822 / 2.5869$

Spot rate GBP 1 = CHF $2.5850 / 2.5881$

Therefore 3 month swap points are at discount of 28/12.

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Question 5

The following information relating to the acquiring Company Abhiman Ltd. and the target Company Abhishek Ltd. are available. Both the Companies are promoted by Multinational Company, Trident Ltd. The promoter's holding is 50% and 60% respectively in Abhiman Ltd. and Abhishek Ltd. :

	Abhiman Ltd	Abhishek Ltd.
Share Capital (Rs.)	200 lakh	100 lakh
Free Reserve and Surplus (Rs.)	800 lakh	500 lakh
Paid up Value per share (Rs.)	100	10
Free float Market Capitalisation (Rs.)	400 lakh	128 lakh
P/E Ratio (times)	10	4

Trident Ltd. is interested to do justice to the shareholders of both the Companies. For the swap ratio weights are assigned to different parameters by the Board of Directors as follows:

Book Value	25%
EPS (Earning per share)	50%
Market Price	25%

- (a) What is the swap ratio based on above weights?
- (b) What is the Book Value, EPS and expected Market price of Abhiman Ltd. after acquisition of Abhishek Ltd. (assuming P.E. ratio of Abhiman Ltd. remains unchanged and all assets and liabilities of Abhishek Ltd. are taken over at book value).
- (c) Calculate:
- Promoter's revised holding in the Abhiman Ltd.
 - Free float market capitalization.
 - Also calculate No. of Shares, Earning per Share (EPS) and Book Value (B.V.), if after acquisition of Abhishek Ltd., Abhiman Ltd. decided to :
 - Issue Bonus shares in the ratio of 1 : 2; and
 - Split the stock (share) as Rs. 5 each fully paid.
- (20 Marks)

Answer

(a) Swap Ratio	Abhiman Ltd.	Abhishek Ltd.
Share Capital	200 Lakh	100 Lakh
Free Reserves	<u>800 Lakh</u>	<u>500 Lakh</u>
Total	<u>1000 Lakh</u>	<u>600 Lakh</u>
No. of Shares	2 Lakh	10 Lakh
Book Value per share	Rs. 500	Rs. 60

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Promoter's holding	50%	60%
Non promoter's holding	50%	40%
Free Float Market Cap. i.e. relating to Public's holding	400 Lakh	128 Lakh
Hence Total market Cap.	800 Lakh	320 Lakh
No. of Shares	2 Lakh	10 Lakh
Market Price	Rs. 400	Rs. 32
P/E Ratio	10	4
EPS	40	8

Calculation of Swap Ratio

Book Value	1 : 0.12 i.e.	0.12 x 25%	0.03
EPS	1 : 0.2	0.20 x 50%	0.10
Market Price	1 : 0.08	0.08 x 25%	<u>0.02</u>
		Total	<u>0.15</u>

Swap ratio is for every one share of Abhishek Ltd., to issue 0.15 shares of Abhiman Ltd.
Hence total no. of shares to be issued

$$10 \text{ Lakh} \times 0.15 = 1.50 \text{ lakh shares}$$

(b) Book Value , EPS & Market Price

Total No of Shares	2 Lakh + 1.5 Lakh = 3.5 Lakh
Total Capital	Rs. 200 Lakh + Rs. 150 Lakh = Rs. 350 Lakh
Reserves	Rs. 800 Lakh + Rs. 450 Lakh = Rs. 1,250 Lakh
Book Value	<u>Rs. 350 Lakh + Rs. 1,250 Lakh</u> = Rs. 457.14 per share 3.5 Lakh

$$\text{EPS} = \frac{\text{Total Profit}}{\text{No. of Share}} = \frac{\text{Rs.80 Lakh} + \text{Rs.80 Lakh}}{3.5 \text{ Lakh}} = \frac{\text{Rs.160 Lakh}}{3.5} = \text{Rs. 45.71}$$

$$\text{Expected Market Price} = \text{EPS (Rs. 45.71)} \times \text{P/E Ratio (10)} = \text{Rs. 457.10}$$

(c) (1) Promoter's holding

Promoter's Revised Holding	Abhiman 50% i.e.	1.00 Lakh shares
	Abhishek 60% i.e.	<u>0.90 Lakh shares</u>
	Total	<u>1.90 Lakh shares</u>

$$\text{Promoter's \%} = 1.90/3.5 \times 100 = 54.29\%$$

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(2) Free Float Market Capitalisation

Free Float Market = (3.5 Lakh – 1.9 Lakh) x Rs. 457.10
Capitalisation = Rs. 731.36 Lakh

(3) (i) & (ii)

Revised Capital Rs. 350 Lakh + Rs. 175 Lakh = Rs. 525 Lakh
No. of shares before Split (F.V Rs. 100) 5.25 Lakh
No. of Shares after Split (F.V. Rs 5) 5.25 x 20 = 105 Lakh
EPS 160 Lakh / 105 Lakh = 1.523
Book Value Cap. Rs. 525 Lakh + Rs. 1075 Lakh
No. of Shares = 105 Lakh
= Rs.15.238 per share

Question 6

- (a) Consider two bonds, one with 5 years to maturity and the other with 20 years to maturity. Both the bonds have a face value of Rs. 1,000 and coupon rate of 8% (with annual interest payments) and both are selling at par. Assume that the yields of both the bonds fall to 6%, whether the price of bond will increase or decrease? What percentage of this increase/decrease comes from a change in the present value of bond's principal amount and what percentage of this increase/decrease comes from a change in the present value of bond's interest payments? (8 Marks)
- (b) Consider a bond selling at its par value of Rs. 1,000, with 6 years to maturity and a 7% coupon rate (with annual interest payment), what is bond's duration? (6 Marks)
- (c) If the YTM of the bond in (b) above increases to 10%, how it affects the bond's duration? And why? (3 Marks)
- (d) Why should the duration of a coupon carrying bond always be less than the time to its maturity? (3 Marks)

Answer

- (a) If the yield of the bond falls the price will always increase. This can be shown by following calculation.

IF YIELD FALLS TO 6%

Price of 5yr. bond

Rs. 80 (PVIFA 6%, 5yrs.) + Rs. 1000 (PVIF 6%, 5yrs.)

Rs. 80 (4.212) + Rs. 1000 (0.747)

Rs. 336.96 + Rs. 747 = Rs. 1,083.96

FINAL EXAMINATION : JUNE, 2009

Increase in 5 year's bond price = Rs. 83.96

Current price of 20 year bond

Rs. 80 (PVIFA 6%, 20) + Rs. 1,000 (PVIF 6%, 20)

Rs. 80 (11.47) + Rs. 1,000 (0.312)

Rs. 917.60 + Rs. 312.00 = Rs. 1229.60

So increase in bond price is Rs. 229.60

PRICE INCREASE DUE TO CHANGE IN PV OF PRINCIPAL

5 yrs. Bond

Rs. 1,000 (PVIF 6%, 5) – Rs. 1,000 (PVIF 8%, 5)

Rs. 1,000 (0.747) – Rs. 1,000 (0.681)

Rs. 747.00 – Rs. 681.00 = Rs. 66.00

& change in price due to change in PV of Principal

$(Rs. 66 / Rs. 83.96) \times 100 = 78.6\%$

20 yrs. Bond

Rs. 1,000 (PVIF 6%, 20) – Rs. 1,000 (PVIF 8%, 20)

Rs. 1,000 (0.312) – Rs. 1,000 (0.214)

Rs. 312.00 – Rs. 214.00 = Rs. 98.00

& change in price due to change in PV of Principal

$(Rs. 98 / Rs. 229.60) \times 100 = 42.68\%$

PRICE CHANGE DUE TO CHANGE IN PV OF INTEREST

5 yrs. Bond

Rs. 80 (PVIFA 6%, 5) – Rs. 80 (PVIFA 8%, 5)

Rs. 80 (4.212) – Rs. 80 (3.993)

Rs. 336.96 – Rs. 319.44 = Rs. 17.52

% change in price $\frac{Rs.17.52}{Rs.83.96} \times 100 = 20.86\%$

20 yrs. Bond

Rs. 80 (PVIFA 6%, 20) – Rs. 80 (PVIFA 8%, 20)

Rs. 80 (11.47) – Rs. 80 (9.82)

Rs. 917.60 – Rs. 785.60 = Rs. 132

& change in price = $\frac{Rs.132}{Rs.229.60} \times 100 = 57.49\%$

PAPER – 2 : STRATEGIC FINANCIAL MANAGEMENT

(b) Duration in the average time taken to recollect back the investment

Years (A)	Coupon Payments (Rs.)	Redemption (Rs.)	Total (B) (Rs.)	PVIF @ 7% (C) (Rs.)	(A)x(B)x (C) (Rs.)
1	70	-	70	0.935	65.45
2	70	-	70	0.873	122.22
3	70	-	70	0.816	171.36
4	70	-	70	0.763	213.64
5	70	-	70	0.713	249.55
6	70	1000	1070	0.666	<u>4,275.72</u>
				Σ ABC	<u>5,097.94</u>

$$\text{Duration} = \frac{\Sigma ABC}{\text{Purchase Price}}$$

$$\frac{\text{Rs.}5097.94}{\text{Rs.}1000} = 5.098 \text{ years}$$

(c) If YTM goes up to 10% , current price of the bond will decrease to

$$\text{Rs. } 70 \times \text{PVIFA} (10\%,6) + \text{Rs. } 1000 \text{ PVIF} (10\%,6)$$

$$\text{Rs. } 304.85 + \text{Rs. } 564.00 = \text{Rs. } 868.85$$

Year (A)	Inflow (Rs.) (B)	PVIF @ 10% (C)	(A)x(B)x (C) (Rs.)
1	70	0.909	63.63
2	70	0.826	115.64
3	70	0.751	157.71
4	70	0.683	191.24
5	70	0.621	217.35
6	1070	0.564	<u>3,620.88</u>
		Σ ABC	<u>4,366.45</u>

$$\text{New Duration Rs. } 4,366.45 / \text{Rs. } 868.85 = 5.025 \text{ years}$$

The duration of bond decreases, reason being the receipt of slightly higher portion of one's investment on the same intervals.

(d) Duration is nothing but the average time taken by an investor to collect his/her investment. If an investor receives a part of his/her investment over the time on specific intervals before maturity, the investment will offer him the duration which would be lesser than the maturity of the instrument. Higher the coupon rate, lesser would be the duration.