

PAPER –2 : MANAGEMENT ACCOUNTING AND FINANCIAL ANALYSIS

QUESTIONS

Swap

- Suppose you are a treasurer of XYZ plc in the UK. XYZ have two overseas subsidiaries, one based in Amsterdam and one in Switzerland. The Dutch subsidiary has surplus Euros in the amount of 7,25,000 which it does not need for the next three months but which will be needed at the end of that period (91 days). The Swiss subsidiary has a surplus of Swiss Francs in the amount of 9,98,077 that, again, it will need on day 91. The XYZ plc in UK has a net balance of £75,000 that is not needed for the foreseeable future.

Given the rates below, what is the advantage of swapping Euros and Swiss Francs into Sterling?

Spot Rate €/£ 0.6858- 0.6869

91 day Pts 0.0037 0.0040

Spot Rate £/CHF 2.3295- 2.3326

91 day Pts 0.0242 0.0228

Interest rates for the Deposits

Amount of Currency	91 day Interest Rate % pa		
	£	€	CHF
0 – 100,000	1	$\frac{1}{4}$	0
100,001 – 500,000	2	$1\frac{1}{2}$	$\frac{1}{4}$
500,001 – 1,000,000	4	2	$\frac{1}{2}$
Over 1,000,000	5.375	3	1

Merger and Acquisition

- Cool-cool Ltd.. makes thermal clothing for winter sports and outdoor work, and is considering acquiring Sking Shell Ltd. which manufactures and sells ski clothing. Sking Shell is about one quarter of Frozen's size and manufactures its entire product line in a small rented factory on a mountaintop in Manali. It costs about Rs.10,00,000 a year in overhead to operate in the factory. Cool-cool Ltd. produces its output in a less popular in North but more popular north-east locations. Its factory has at least 50% excess capacity. Cool-cool's plan is to acquire Sking Shell, and combine production operations in its north-eastern factory, but otherwise run the companies separately.

Sking Shell's beta is 2.0, Treasury bills currently yield 5% and the Nifty Index is yielding 9%. The corporate income tax rate for both firms is 40%. Because Sking Shell will no longer be maintaining its own production facilities, it can be assumed that only a minimal amount of cash will have to be reinvested to keep its equipment current and for future

growth. This amount is estimated at Rs. 1,00,000 per year. Selected financial information for Sking Shell is as follows:

Revenue Rs. 1,25,00,000

EAT Rs. 13,00,000

Depreciation Rs. 6,00,000

- (a) Calculate the appropriate discount rate for evaluating the Sking Shell acquisition.
 - (b) Determine the annual cash flow expected by Cool-cool Ltd. from Sking Shell if the acquisition is made (don't forget to include the synergy).
 - (c) Calculate the value of the acquisition to Cool-cool Ltd. assuming the benefits last for (1) five years, (2) 10 years, and (3) 15 years.
 - (d) Sking Shell has 2,50,000 shares of stock outstanding. Calculate the maximum price Cool-cool Ltd. should be willing to pay per share to acquire the firm under the three assumptions in part c.
 - (e) If Cool-cool Ltd. is willing to assume the benefits of the Sking Shell acquisition will last indefinitely but not grow, what should it be willing to pay per share?
3. In above question, assume that the cash flow from the Sking Shell acquisition grows at 10% from its initial value for one year and then grows at 5% indefinitely (starting in the third year). Calculate the value of the firm and the implied stock price under these conditions. Use a terminal value at the beginning of the period of 5% growth. What price premium is implied in dollars and as a percent of market price if Sking Shell's stock is currently selling at Rs. 62?

Corpoarte Restructing

4. The Nishan Ltd. has 35,000 shares of equity stock outstanding with a book value of Rs.20 per share. It owes debt Rs.15,00,000 at an interest rate of 12%. Selected financial results are as follows.

Income and Cash Flow		Capital	
EBIT	Rs. 80,000	Debt	Rs.1,500,000
Interest	<u>1,80,000</u>	Equity	<u>7,00,000</u>
EBT	(Rs.1,00,000)		Rs.2,200,000
Tax	<u>0</u>		
EAT	(Rs.1,00,000)		
Depreciation	Rs. 50,000		
Principal repayment	<u>(Rs. 75,000)</u>		
Cash Flow	<u>(Rs.1,25,000)</u>		

Restructure the financial line items shown assuming a composition in which creditors agree to convert two thirds of their debt into equity at book value. Assume Nishan will

pay tax at a rate of 15% on income after the restructuring, and that principal repayments are reduced proportionately with debt. Who will control the company and by how big a margin after the restructuring?

Bond Valuation

5. Given a five-year, 8% coupon bond with a face value of Rs.1,000 and coupon payments made annually, determine its values given it is trading at the following yields: 8%, 6%, and 10%. Comment on the price and yield relation you observe. What are the percentage changes in value when the yield goes from 8% to 6% and when it goes from 8% to 10%?
6. Given a two-year, 8% annual coupon bond with a face value of Rs. 1,000 and with annual coupon payments that is fully taxable and selling at par, and an identical bond that is tax free, what would the yield and price on the tax-free bond have to be for an investor in a 35% tax bracket to be indifferent between the two bonds?

Lease Evaluation

7. Mr. Lee wants to acquire a mechanized feed spreader that cost €80,000. He intends to operate the equipment for 5 years, at which time it will need to be replaced. However, it is expected to have a salvage value of €10,000 at the end of the fifth year. The asset will be depreciated on a straight-line basis (€16,000 per year) over the 5 years, and Lee is in a 30 percent tax bracket. Two means for financing the feed spreader are available. A lease arrangement calls for lease payments of €19,000 annually, payable in advance. A debt alternative carries an interest of €19,000 annually, payable in advance. A debt alternative carries an interest cost of 10 percent. Debt payments will be at the start of each of the 5 years using mortgage type of debt amortization.
 - (a) Using the present-value method, determine the best alternative.
 - (b) Using the internal-rate-of-return method, which is the best alternative? Does your answer differ from that to part a ?

Right Issue

8. The stock of the Soni plc is selling for £50 per common stock. The company then issues rights to subscribe to one new share at £40 for each five rights held.
 - (a) What is the theoretical value of a right when the stock is selling rights-on?
 - (b) What is the theoretical value of one share of stock when it goes ex-rights?
 - (c) What is the theoretical value of a right when the stock sells ex-rights at £50?
 - (d) John Speculator has £1,000 at the time Soni plc goes ex-rights at £50 per common stock. He feels that the price of the stock will rise to £60 by the time the rights expire. Compute his return on his £1,000 if he (1) buys Soni plc stock at £50, or (2) buys the rights as the price computed in part c, assuming his price expectations are valid.

Business Valuation

9. PQR Ltd. is a management consultancy firm in the industry for the last 10 year. It got listed its equity share 4 years ago at a Recognized Stock Exchange. The company has pursued a policy of aggressive growth and specializes in providing services to the entities in high technology and high growth sectors. The company has no leverage element in their capital structure and financed by equity shares of Rs.50 Crores of Rs.2 per share (par value).

The company's result for the year ending 31 March 2009, have just announced. Profit before tax were Rs.12.66 Crores. As per Chairman cum Managing Director's statement (included in the forecast column of company's Annual Report for the year ending 31 March 2009) earnings might be expected to rise by 4% which is lower than annual rate than in the recent years. This is due to global recession especially in US Economy.

XYZ Ltd. is another company, in the same business but has been established much longer. It sources more to traditional business sectors and its earning track record has been erratic. In most of the daily newspaper poor management have been blamed for poor performance of company and due to this stock of the company in market had lost its value for sometimes. The current earning forecast of XYZ Ltd is also 4% for the foreseeable future. The capital structure of the company consists of Rs.18 crores equity share capital of Rs.1 (par value). The Profit before tax of the company for the year ending 31 March 2009 is Rs.11.25 Crores.

PQR Ltd. has recently approached the shareholders of XYZ Ltd with a bid of five new share in PQR Ltd for every six shares in XYZ Ltd. Otherwise shareholders can accept a cash payment @Rs.3.45 per share.

Following the announcement of this bid, the market price of PQR Ltd. shares fell by 10% whereas the price of Shares of XYZ Ltd. rose up by 14%. The P/E ratio and dividend yield of these two companies and other two companies in same industry immediately prior to bid announcement is as follows:

Company	Share Price (Rs.)		P/E Ratio	Dividend yield (%)
	High	Low		
PQR Ltd	4.25	3.25	11	2.4
XYZ Ltd	3.50	2.85	7	3.1
LMN Ltd.	1.87	1.22	9	5.2
DEF Ltd.	2.30	1.59	16	2.4

The Corporate Tax Rate is 30%. PQR Ltd is post tax cost of equity is 13% and XYZ Ltd's cost of equity is 11%.

Evaluate, whether the proposed share-for-share offer's likely to be beneficial to shareholders in both PQR Ltd and XYZ Ltd. Please use the information and merger terms available above.

You may make appropriate assumption to forecast post merger values.

Dividend Theory

10. Zumo & Co. is a watch manufacturing company and is all equity financed and has paid up capital Rs.10,00,000 (Rs.10 per shares)

The other data related to the company is as follows:

Year	EPS (Rs.)	Net Dividend per share (Rs.)	Share Price (Rs.)
2004	4.20	1.70	25.20
2005	4.60	1.80	18.40
2006	5.10	2.00	25.50
2007	5.50	2.20	27.50
2008	6.20	2.50	37.20

Zumo & Co. has hired one management consultant, Vidal Consultants to analyze the future earnings and other related item for the forthcoming years.

As per Vidal Consultants's report

- (1) The earnings and dividend will grow at 25% for the next two years.
- (2) Earnings are likely at rate of 10% from 3rd year and onwards.
- (3) Further if there is reduction in earnings growth occurs dividend payout ratio will increase to 50%

Assuming the tax rate as 33% (not expected to change in the foreseeable future) calculate the estimated share price and P/E Ratio which analysts now expect for Zumo & Co., using the dividend valuation model.

You may further assume that post tax cost of capital is 18%.

Financial Services

11. The following financial information related to Norwason India Ltd.:

	2008	2007
	Rs. 000	Rs. 000
Sales (all on credit)	37,400	26,720
Cost of sales	<u>34,408</u>	<u>23,781</u>
Operating profit	2,992	2,939
Finance costs (interest payments)	<u>355</u>	<u>274</u>
Profit before taxation	<u>2,637</u>	<u>2,665</u>

	<u>2008</u>	<u>2007</u>
	Rs. 000	Rs. 000
Non-current assets	13,632	12,750

Current assets		
Inventory	4,600	2,400
Trade receivables	<u>4,600</u>	<u>2,200</u>
	9,200	4,600
Current liabilities		
Trade payables	4,750	2,000
Overdraft	<u>3,225</u>	<u>1,600</u>
	7,975	3,600
Net current assets	<u>1,225</u>	<u>1,000</u>
	14,857	13,750
8% Bonds	<u>2,425</u>	<u>2,425</u>
	<u>12,432</u>	<u>11,325</u>
Capital and reserves		
Share capital	6,000	6,000
Reserves	<u>6,432</u>	<u>5,325</u>
	12,432	11,325

The average variable overdraft interest rate in each year was 5%. The 8% bonds are redeemable in ten years' time.

A factor has offered to take over the administration of trade receivables on a non-recourse basis for an annual fee of 3% of credit sales. The factor will maintain a trade receivables collection period of 30 days and Norwason India Ltd will save Rs.1,00,000 per year in administration costs and Rs. 3,50,000 per year in bad debts. A condition of the factoring agreement is that the factor would advance 80% of the face value of receivables at an annual interest rate of 7%.

Evaluate whether the proposal to factor trade receivables is financially acceptable.

Foreign Exchange Management

12. On 30th June 2009 when a forward contract matured for execution you are asked by an importer customer to extend the validity of the forward sale contract for US\$ 10,000 for a further period of three months.

Contracted Rate US\$1 = Rs.41.87

The US Dollar quoted on 30.6.2009

Spot	40.4800/40.4900
Premium July	0.1100/0.1300
Premium August	0.2300/0.2500
Premium September	0.3500/0.3750

Calculate the cost for your customer in respect of the extension of the forward contract. Rupee values to be rounded off to the nearest Rupee.

Margin 0.080% for Buying Rate

Margin 0.25% for Selling Rate

13. You sold € 1 million value spot to your customer at € 1= Rs.54.60 and covered yourself in Singapore market on the same day when the exchange rate were as under:

Spot US\$ 1 = € 0.7373/0.7375

Local inter bank US\$ 1 = Rs.40.1850/40.1950

(Brokerage paid Rs.2,000)

Calculate the cross rate nearest to the fourth decimal and ascertain profit or loss in the transaction to the nearest Rupee.

Decision Tree

14. MCL Technologies is evaluating new software for ERP. The software will have a 3-year life and cost €1,000 thousands. Its impact on cash flows is subject to risk . Management estimates that there is a 50-50 chance that the software will either save the company €1,000 thousands in the first year or save it nothing at all. If nothing at all, savings in the last 2 years would be zero. Even worse, in the second year an additional outlay of €300 thousands may be required to convert back to the original process, for the new software may result in less efficiency. Management attaches a 40 percent probability to this occurrence, given the fact that the new software “ failed” in the first year. If the software proves itself, second-year cash flows may be either €1,800 thousands, €1,400 thousands, or €1,000 thousands, with probabilities of 0.20, 0.60, and 0.20, respectively. In the third year, cash, inflows are expected to be €200 thousands greater or €200 thousands less than the cash flow in period 2, with an equal chance of occurrence. (Again, these cash flows depend on the cash flow in period 1 being €1,000 thousands.) All the cash flows are after taxes.

- (a) Set up a probability tree to depict the foregoing cash-flow possibilities.
- (b) Calculate a net present value for each three-year possibility, using a risk-free rate of 5 percent.
- (c) What is the risk of the project?

Derivatives

15. From the following data compute value of call option using the Black-Scholes Option Pricing Model (OPM).

Stock Price = Rs. 27.00.

Strike Price = Rs. 25.00

Time to expiration = 6 Months.

Risk-Free Rate = 6.0%.

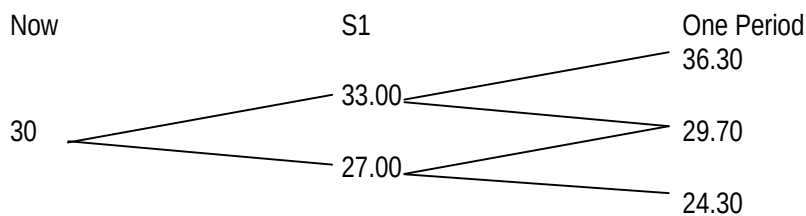
Stock Return Variance = 0.11.

16. The following information is available for a call option:

Time to expiration (months)	3
Risk free rate	8%
Exercise price	€60
Stock price	€70
Call price	€14

What is the value of a put option if the time to expiration is 3 months, risk free rate is 8%, exercise price is €60 and the stock price is €70?

17. Following is a two-period tree for a share of stock in CAB Ltd.:



Using the Binomial model, calculate the current fair value of a regular call option on CAB Stock with the following characteristics : X = Rs. 28, Risk Free Rate = 5 percent (per sub period). You should also indicate the composition of the implied riskless hedge portfolio at the valuation date.

18. In March, a derivatives dealer offers you the following quotes for June British pound option contracts (expressed in U.S. dollars per GBP):

Contract	Strike Price	MARKET PRICE OF	
		Bid	Offer
Call	USD 1.40	0.0642	0.0647
Put		0.0255	0.0260
Call	1.44	0.0417	0.0422
Put		0.0422	0.0427
Call	1.48	0.0255	0.0260
Put		0.0642	0.0647

- (a) Assuming each of these contracts specifies the delivery of GBP 31,250 and expires in exactly three months, complete a table similar to the following (expressed in dollars) for a portfolio consisting of the following positions:

- (1) Long a 1.44 call

- (2) Short a 1.48 call
- (3) Long a 1.40 put
- (4) Short a 1.44 put

June USD/GBP	Net Initial Cost	Call 1.44 Profit	Call 1.48 Profit	Put 1.40 Profit	Put 1.44 Profit	Net Profit
1.36	—	—	—	—	—	—
1.40	—	—	—	—	—	—
1.44	—	—	—	—	—	—
1.48	—	—	—	—	—	—
1.52	—	—	—	—	—	—

- (b) Graph the total net profit (i.e., cumulative profit less net initial cost, ignoring time value considerations) relationship using the June USD/GBP rate on the horizontal axis (be sure to label the breakeven point(s)). Also, comment briefly on the nature of the currency speculation represented by this portfolio.
 - (c) If in exactly one month (i.e., in April) the spot USD/GBP rate falls to 1.385 and the effective annual risk-free rates in the United States and England are 5 percent and 7 percent, respectively, calculate the equilibrium price differential that should exist between a long 1.44 call and a short 1.44 put position.
19. In mid-May, there are two outstanding call option contracts available on the stock of MGH Co.:

Call #	Exercise Price	Expiration Date	Market Price
1	€50	August 19	€8.40
2	€60	August 19	€3.34

- (a) Assuming that you form a portfolio consisting of one Call #1 held long and two Calls #2 held short, complete the following table showing your intermediate steps. In calculating net profit, be sure to include the net initial cost of the options.

Price of MGH Stock at Expiration	Profit on Call #1 Position	Profit on Call #2 Position	Net Profit on Total Position
€40	—	—	—
€45	—	—	—
€50	—	—	—
€55	—	—	—
€60	—	—	—

€65	—	—	—
€70	—	—	—
€75	—	—	—

- (b) Graph the net profit relationship in Part a, using stock price on the horizontal axis. What is (are) the breakeven stock price(s)? What is the point of maximum profit?
- (c) Under what market conditions will this strategy (which is known as a call ratio spread) generally make sense? Does the holder of this position have limited or unlimited liability?

Futures

20. The following information about copper scrap is given:

- Spot price : \$10,000 per ton
- Futures price : \$10,800 for a one year contract
- Interest rate : 12 %
- PV (storage costs) : \$500 per year

What is the PV (convenience yield) of copper scrap?

Portfolio Management

21. The following data are available to you as a portfolio manager.

Security	Expected Return	Beta	Standard Deviation
O	0.32	1.70	0.50
P	0.30	1.40	0.35
Q	0.25	1.10	0.40
R	0.22	0.95	0.24
S	0.20	1.05	0.28
T	0.14	0.70	0.18
Composite Index	0.12	1.000	0.20
T-bills	0.08	0.00	0.00

- (a) In terms of a security market line (SML) , which of the securities listed above are undervalued? Why?
- (b) Assume that a portfolio is constructed using equal portions of the six stocks listed above.
- (i) Why is the expected return of such a portfolio?
- (ii) What would the expected return if this portfolio was increased by 40% through borrowed funds with the cost of borrowing at 12%?
22. Mr. Nirmal Kumar has categorized all the available stock in the market into the following types:
- (i) Small cap growth stocks
- (ii) Small cap value stocks

(iii) Large cap growth stocks

(iv) Large cap value stocks

Mr. Nirmal Kumar also estimated the weights of the above categories of stocks in the market index. Further more, the sensitivity of returns on these categories of stocks to the three important factor are estimated to be:

Category of Stocks	Weight in the Market Index	Factor I (Beta)	Factor II (Price Book)	Factor III (Inflation)
Small cap growth	25%	0.80	1.39	1.35
Small cap value	10%	0.90	0.75	1.25
Large cap growth	50%	1.165	2.75	8.65
Large cap value	15%	0.85	2.05	6.75
Risk Premium		6.85%	-3.5%	0.65%

The rate of return on treasury bonds is 4.5%

Required:

- Using Arbitrage Pricing Theory, determine the expected return on the market index.
- Using Capital Asset Pricing Model (CAPM), determine the expected return on the market index.
- Mr. Nirmal Kumar wants to construct a portfolio constituting only the 'small cap value' and 'large cap growth' stocks. If the target beta for the desired portfolio is 1, determine the composition of his portfolio.

Mutual Fund

23. Consider the following information about the return on Classic Mutual Fund, the market return and the T-bill returns:

Year	Classic Mutual Fund	Market Index	T-bills
1994	17.1	10.8	5.4
1995	-14.6	-8.5	6.7
1996	1.7	3.5	6.5
1997	8.0	14.1	4.3
1998	11.5	18.7	4.1
1999	-5.8	-14.5	7.0
2000	-15.6	-26.0	7.9
2001	38.5	36.9	5.8
2002	33.2	23.6	5.0
2003	-7.0	-7.2	5.3
2004	2.9	7.4	6.2
2005	27.4	18.2	10.0

2006	23.0	31.5	11.4
2007	-0.6	-4.9	14.1
2008	21.4	20.4	10.7

The following additional information is available regarding the comparative performance of five mutual funds:

	Return (%)	Standard Deviation (%)	Beta	
Alpha	1.95	20.03	0.983	0.819
Beta	11.57	18.33	0.971	0.881
Gama	8.41	22.92	1.169	0.816
Rho	9.05	24.04	1.226	0.816
Theta	7.86	15.46	0.666	0.582

From the above information, calculate all the inputs required for determining the Sharpe's Ratio, Treynor's ratio and Jensen's ratio.

24. Risk appetite, risk aversion and risk premium are sometimes used interchangeably. Explain this statement. How investor's expectation vary with the variation in the level of risk appetite.
25. Write Short Notes on
 - (i) What is relationship between EVA and MVA?
 - (ii) Explain the term "Balance Transfer".
 - (iii) 'Stack hedging' and 'Strip hedging'

SUGGESTED ANSWERS/HINTS

1. Individual Basis

Holland	Total
$\text{€ } 7,25,000 \times 0.02 \times 91/360 = \text{€ } 3,665.28$	$\text{€ } 7,28,665.28 = \text{£ } 5,03,434.84$ (728,665.28x0.6909)
Switzerland	
$\text{CHF } 9,98,077 \times 0.005 \times 91/360 = \text{CHF } 1,261.46$	$\text{CHF } 9,99,338.46 = \text{£ } 4,33,496.05$ (9,99,338.46÷2.3053)
UK	
$\text{£ } 75,000 \times 0.01 \times 91/365 = \text{£ } 186.99$	<u>£ 75,186.99</u>
Total GBP at 91 days	<u>£ 10,12,117.88</u>

Swap to Sterling

Sell € 7,25,000 (Spot at 0.6869) buy £	£ 4,98,002.50
Sell CHF 9,98,077(Spot at 2.3295) buy £	£ 4,28,451.16
Independent GBP amount	<u>£ 75,000.00</u>
	£ 1,001,453.66
Interest (1,001,453.66 x 0.05375 x 91/365)	<u>£ 13,420.16</u>
Total GBP at 91 days	£ 1,014,873.82
Less: Total GBP at 91 days as per individual basis	<u>£ 1,012,117.88</u>
Net Gain	<u>£ 2,755.94</u>

2. (a) $k_{SS} = k_{RF} + (k_M - k_{RF}) \beta_{SS}$
 $= 5\% + (9\% - 5\%) 2.0$
 $= 13\%$

(b) Cash Flow:	(Rs.000)
EAT	1,300
Depreciation	<u>600</u>
Operating cash flow	1,900
Savings on factory operation after tax	600
Less reinvested cash	<u>(100)</u>
	<u>2,400</u>

(c) Value of Sking Shell Acquisition

Planning Horizon

	5 yrs	10 yrs	(Rs.000) 15 yrs
Yearly cash flow	Rs.2,400	Rs.2,400	Rs.2,400
× PVFA _{13,n}	<u>3.5172</u>	<u>5.4262</u>	<u>6.4624</u>
Value of acquisition	Rs.8,441	Rs.13,023	Rs.15,510
(d) Divide by # shares	250,000	250,000	250,000
Offer price	Rs. 33.76	Rs. 52.09	Rs. 62.04
(e) Rs.24,00,000/0.13 = Rs.1,84,62,000			
Rs.1,84,62,000/2,50,000 = Rs.73.85			

3.			(Rs. 000)
Year	1	2	3
Cash flow	Rs. 2,400	Rs. 2,640	Rs. 2,772

$$\text{Value at end of year 2} = \frac{\text{Rs. 2,772}}{0.13 - 0.05} = \text{Rs. 34,650}$$

$$\begin{aligned} \text{PV} &= \text{Rs. 2,400}[\text{PVF}_{13,1}] + \text{Rs. 2,640}[\text{PVF}_{13,2}] + \text{Rs. 34,650}[\text{PVF}_{13,2}] \\ &= \text{Rs. 2,400}(0.8850) + \text{Rs. 2,640}(0.7831) + \text{Rs. 34,650}(0.7831) \\ &= \text{Rs. 2,124} + \text{Rs. 2,067} + \text{Rs. 27,134} \\ &= \text{Rs. 31,325} \end{aligned}$$

$$\text{Price per share} = \frac{\text{Rs. 31,325,000}}{\text{Rs. 2,50,000}} = \text{Rs. 125.30}$$

$$\text{Premium} = \text{Rs. 125.30} - \text{Rs. 62} = \text{Rs. 63.30},$$

Premium is $(\text{Rs. 63.30}/\text{Rs. 62}) = 102.10\%$ of market price.

4. Creditors would convert Rs.10,00,000 in debt to equity by accepting Rs.1,000,000/Rs.20= 50,000 shares of stock.

The remaining Rs.500,000 of debt would generate interest of

$$\text{Rs. 500,000} \times 0.12 = \text{Rs. 60,000}$$

Repayment of principal would be reduced by two thirds to Rs.25,000 per year.

The result is as follows

Income and Cash Flow		Capital	
EBIT	Rs. 80,000	Debt	Rs. 500,000
Interest	<u>60,000</u>	Equity	<u>Rs. 1,700,000</u>
EBT	Rs. 20,000		<u>Rs. 2,200,000</u>
Tax	<u>3,000</u>		
EAT	Rs. 17,000		
Depreciation	50,000		
Principal repayment	<u>(25,000)</u>		
Cash Flow	<u>Rs. 42,000</u>		

After the restructuring there will be a total of $(35,000+50,000)$ 85,000 shares of equity stock outstanding. The original shareholders will still own 35,000 shares (approximately 41%), while the creditors will own 50,000 shares (59%). Hence the creditors will control the company by a substantial majority.

5.

$$V_0 = \sum_{t=1}^5 \frac{80}{(1.08)^t} + \frac{1000}{(1.08)^5} = 80 \left[\frac{1 - (1/1.08)^5}{0.08} \right] + \frac{1000}{(1.08)^5} = \text{Rs. } 1,000$$

$$V_0 = \sum_{t=1}^5 \frac{80}{(1.06)^t} + \frac{1000}{(1.06)^5} = 80 \left[\frac{1 - (1/1.06)^5}{0.06} \right] + \frac{1000}{(1.06)^5} = \text{Rs. } 1,084.25$$

$$V_0 = \sum_{t=1}^5 \frac{80}{(1.10)^t} + \frac{1000}{(1.10)^5} = 80 \left[\frac{1 - (1/1.10)^5}{0.10} \right] + \frac{1000}{(1.10)^5} = \text{Rs. } 924.18$$

The answer shows the inverse relationship that exists between the price of a bond and its rate of return.

From 8% to 6%, the percentage change in value is 8.425%; from 8% to 10%, the percentage change in value is -7.582%.

6. For the investor to be indifferent, the tax-free bond's yield would have to be equal to the taxable bond's after-tax yield. Given a 35% tax rate, the taxable bond's after-tax yield is 5.2%:

$$\text{ATY} = (1 - 0.35)0.08 = 0.052$$

Thus, the tax-free bond would have to yield 5.2% for the investor to be indifferent. Given a 5.2% discount rate, the price of the tax-free bond would have to be Rs. 1,051.92:

$$P_0 = \frac{80}{(1.052)} + \frac{80 + 1000}{(1.052)^2} = 1051.92$$

7. (a) Lease Alternative:

	(1)	(2)	(3)		(4)
End of Year	Lease Payment (€)	Tax Shield (1) x 0.30 (€)	Cash Out Flow (1) - (2) (€)	PVF @ 7 %*	PV of Cash Outflows (€)
0	19,000	0	19,000	1	19,000
1-4	19,000	5,700	13,300	3.3872	45,050
5		5,700	(5,700)	0.713	(4,064)
					<u>€59,986</u>

* 10% (1-0.30)

The present value of cash outflows is €59,986.

(b) Debt Alternative:

Annual debt repayments are:

Let X be the annual installment for loan repayment

Then $€80,000 = X + 3.1699X$ ($3.1699 = \text{PV factor for 4-year annuity at 10\%}$)

$$X = €80,000/4.1699$$

$$X = €19,185$$

End of Year	Debt Payment (€)	Principal Amount Owing (€)	Annual Interest (€)
0	19,185	60,815	0
1	19,185	47,712	6,082
2	19,185	33,298	4,771
3	19,185	17,443	3,330
4	19,187	0	1,774

The principal amount of €80,000 is reduced by the amount of the first payment of €19,185 to give €60,815 at time 0. The last debt payment is slightly higher due to rounding.

Statement showing the Cash Outflows (Debt Alternative)

End of Year	(1) Debt Repayment (€)	(2) Interest (€)	(3) Depreciation (€)	(4) Tax Shield $0.30 \times [(2)+(3)]$ (€)	(5) Out-flows (1) - (4) (€)	PV @ 7%	(6) PV Cash of Out flows (€)
0	19,185	0	0	0	19,185	1	19,185
1	19,185	6,082	16,000	6,625	12,560	0.9346	11,738
2	19,185	4,771	16,000	6,231	12,954	0.8734	11,315
3	19,185	3,330	16,000	5,799	13,386	0.8163	10,927
4	19,187	1,774	16,000	5,332	13,855	0.7629	10,570
5	0	0	16,000	4,800	(4,800)	0.7130	(3,422)
5					(7,000)†	0.7130	(4,991)
							<u>55,322</u>

†Residual value $\times (1 - 0.30)$

Conclusion: As the present value of cash outflows under the debt alternative is lower i.e. €55,322 versus €59,986, hence debt option would be preferred.

(b) Schedule of Cash Flows: IRR Analysis of Lease

End of Year	(1) Cost (€)	(2) Lease Payment (€)	(3) Depreciation (€)	(4) Excess Tax Shield 0.30x (L-D) (€)	(5) Post tax Residual Value (€)	(6) Net cash Flows (€)
0	80,000	19,000	0	0		61,000
1		19,000	16,000	900		(18,100)
2		19,000	16,000	900		(18,100)
3		19,000	16,000	900		(18,100)
4		19,000	16,000	900		(18,100)
5		0	16,000	900	7,000	(6,100)

Solving for the internal rate of return for the last column, we find it to 10.11 percent. The after tax cost of borrowing of 7 percent is lower, and it dominates. The answer is the same as in the present value method of analysis, as we would expect.

8. (a) $R_0 = \frac{P_0 - S}{N+1} = \frac{£50 - £40}{5+1} = £1.67$

(b) $P_x = \frac{(P_0 \times N) + S}{N+1} = \frac{ (£50 \times 5) + £40 }{6} = £48.33$

(c) $R_x = \frac{P_x - S}{N} = \frac{£50 - £40}{5} = £2.00$

(d) (1) $£1,000 / £50 = 20 \text{ shares} \times £60 = £1,200$
 $£1,200 - £1,000 = £200$

(2) $£1,000 / £2 = 500 \text{ rights} \times £4^* = £2,000$
 $£2,000 - £1,000 = £1,000$
 $*R_x = (£60 - £40) / 5 = £4$

9. Working Notes:

	PQR Ltd.	XYZ Ltd	Total
Profit before tax (Rs.crore)	12.66	11.25	23.91
Tax @ 30%	3.80	3.38	7.18
Profit After tax	8.86	7.87	16.73
No. of Shares (Crores)	25	18	40
Earning Per share (Rs.)	0.3544	0.437	0.4183
PE Ratio before Bid	11	7	

Pre Bid Price of share (Rs.)	3.90	3.06	
Market value of company (Rs. Crore)	97.50	55.08	152.058
No. of new shares (Post Bid) (Crores)	25	15	40
% of Combined Entity owned (%)	62.50	37.50	100
Value of original shareholders	95.36	57.22	152.58
Price Per share/Post Bid Price announcement	3.81	3.18	
	(95.36/25)	(57.22/18)	

Thus from above it can be said that in absence of any synergy benefit arising from such merger there will be a transfer of wealth from PQR Ltd. to XYZ Ltd. based on the terms of this offers.

In reality, the price of XYZ Ltd 5 shares is likely to be influenced by the value of cash alternative and the price that will be observed in the market is likely to be below Rs.3.45 per share.

The major question here is what will be P/E Ratio after the merger. If director of PQR Ltd. expect there own pre-bid P/E ratio to be applied to the combined earnings. In such case the market value and share price would be.

Market Value. Rs. 16.73Crores × 11 = Rs. 184.03 Crores.

$$\text{Share Price} = \frac{\text{Rs.184.03}}{40 \text{ crores}} = \text{Rs.4.60 Per share}$$

Calculation of Gain/Loss

- (a) As PQR Ltd. Shareholder's have exactly the same number of shares as they did before the merger. Their share would have rise by 18% as calculated below.

$$\frac{\text{Rs.4.60} - \text{Rs.3.90}}{\text{Rs.3.90}} \times 100$$

- (b) XYZ Ltd's shareholders have five-sixth the number of their old shares. Their share value might therefore be expected to rise by 25% as calculated below.

$$\frac{\text{Rs.3.83}^* - \text{Rs.3.06}}{\text{Rs.3.06}} \times 100$$

$$^* 4.60 \times \frac{5}{6}$$

The shareholders of XYZ Ltd are taking more gain from merger in share exchange because cash alternative is lower and unlikely to be accepted, although it is an assured amount. The cash offer the premium only to 12.7% calculated as follows.

$$\left(\frac{\text{Rs.3.45} - \text{Rs.3.06}}{\text{Rs.3.06}} \right) \times 100 = 12.7\%$$

Alternative Method.

We can also use the Dividend Valuation Model by using Gordon's Model the price of Share of PQR Ltd. will be

$$= \frac{\text{EPS}}{K_e - g} = \frac{0.3544 \times 1.04}{13\% - 4\%} = \text{Rs. 4.09}$$

Using the same assumption the value of XYZ Ltd. would be:

$$= \frac{\text{EPS}}{K_e - g} = \frac{0.437 \times 1.04}{11\% - 4\%} = \text{Rs. 6.49}$$

On the basis of above alternative model share of PQR Ltd is under valued slightly. Whereas the share of XYZ Ltd is substantially undervalued, may be market is doubtful about growth prospects due to previous disappointments. If we believe PQR Ltd.'s forecast the PQR Ltd. are getting XYZ Ltd's share cheap and especially so if any XYZ's share holders accept the cash offer Rs. 3.45 per share

10. (a) The formula for the Dividend valuation Model is

$$P_0 = \frac{D_1}{K_e - g}$$

K_e = Cost of Capital

g = Growth rate

D_1 = Dividend at the end of year 1

On the basis of the information given, the following projection can be made:

Year	DPS (Rs.)	PVF @18%	PV of DPS (Rs.)
2009	3.13	0.847	2.65
2010	3.91	0.718	2.81
2011	5.33*	0.609	<u>3.25</u>
			<u>8.71</u>

*Payout Ratio changed to 50%.

After 2011, the perpetuity value assuming 10% constant annual growth, is:

$$D_1 = \text{Rs. } 5.33 \times 110\% = \text{Rs. } 5.863$$

Therefore P_0 from the end of 2011

$$\frac{\text{Rs. } 5.863}{0.18 - 0.10} = \text{Rs. } 73.29$$

This must be discounted back to the present value, using the 3 year discount factor after 18%.

	Rs.
Present Value of P_0 (Rs. 73.29 × 0.609)	44.63
Add: Dividends 2009 to 2011	<u>8.71</u>
Expected Market Price of Share	<u>53.34</u>

(b) P/E Ratio

$$\begin{aligned} \text{P E Ratio} &= \frac{\text{Expected Market Price of Share (P}_1\text{)}}{\text{Earning Per Share}} \\ &= \frac{\text{Rs. 53.34}}{\text{Rs. 6.20}} = 8.60 \end{aligned}$$

11.

Current receivables	Rs.46,00,000
Receivables under factor (Rs. 3,74,00,000 × 30/365)	Rs.30,74,000
Reduction in receivables (Rs. 46,00,000 – Rs. 30,74,000)	Rs.15,26,000

Computation of Net Cost of Factoring

	(Rs.)
Reduction in finance cost (Rs. 15,26,000 × 0.05) per year	(76,300)
Administration cost savings per year	(1,00,000)
Bad debt savings per year	(3,50,000)
Factor's annual fee (3,74,00,000 × 0.03) per year	11,22,000
Extra interest cost on advance	
Rs. 30,74,000 × 80% × (7% – 5%) per year	<u>49,184</u>
Net cost of factoring	<u>6,44,884</u>

The factor's offer cannot be recommended, since the evaluation shows no financial benefit arising.

12. This extension of forward Contract involves following steps

1. Cancel the contract at TT buying rate.
2. Rebook the contract for three months at the current rate of exchange.

Accordingly

Step 1: Cancel the contract at TT buying rate on 30.6.2009

	Rs.
Spot US\$ 1	40.4800
Less: Margin 0.080%	<u>0.0324</u>
	<u>40.4476</u>

Hence TT buying rate Rs.40.45 (Rounded off)

US\$ 10,000 @ Rs.40.45 Rs.4,04,500/-

US\$ 10,000 @ Rs.41.87 Rs.4,18,700/-

Difference in favour of the bank Rs. 14,200/-.

Step 2: New contract to be booked at the appropriate forward rate.

Three months forward rate is as under:

US\$ 1 Rs.40.4900 Spot Selling

Add: September Premium Rs. 0.3750

Rs. 40.8650

Add: Margin (0.25%) Rs. 0.1022

Rs. 40.9672

Forward rate to be quoted to the customer is US\$ 1 = Rs. 40.97

Thus cost to customer Rs. 14,200/-.

13. Our cost of 1 million €

Cross rate Rs. 40.1950/0.7373 = Rs. 54.5165

1 Million € @ 54.5165 Rs. 5,45,16,500

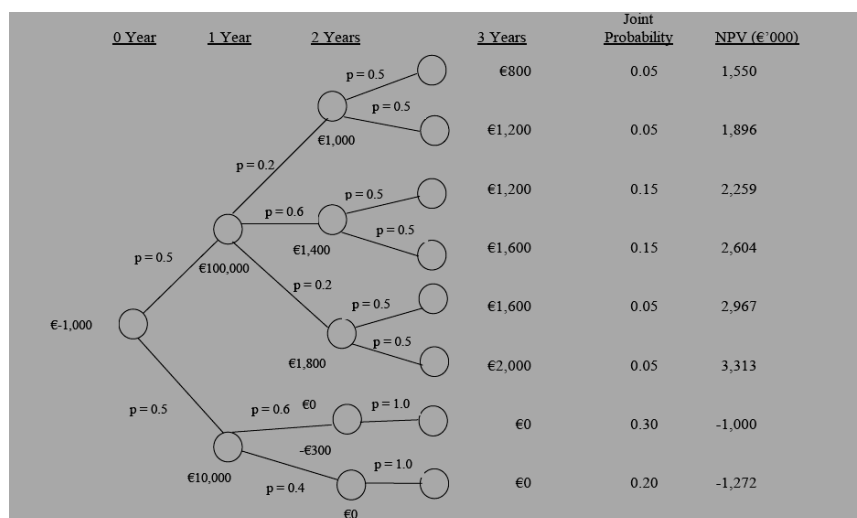
Brokerage Rs. 2,000

Rs. 5,45,18,500

Proceeds of sale to customer @ Rs.54.6000 Rs. 5,46,00,000

Profit Rs. 81,500

14. (a)



Tabular Presentation

Period 0 Cash Flow Thousands €	Period 1 Prob.	Cash Flow Thousands €	Period 2 Cond. Prob.	Cash Flow Thousands €	Period 3 Cond. Prob.	Cash Flow Thousands €	Joint Prob	Overall Present Value Thousands €
-1,000	0.5	0	0.4	-€300	1.0	0	0.2	-€1,272
			0.6	0	1.0	0	0.3	-€1,000
		€1,000	0.2	€1,000	0.5	€800	0.05	€1,550
					0.5	€1,200	0.05	€1,896
	0.5	€1,000	0.6	€1,400	0.5	€1,200	0.15	€2,259
					0.5	€1,600	0.15	€2,604
			0.2	€1,800	0.5	€1,600	0.05	€2,967
					0.5	€2,000	0.05	€3,313

(b) The expected value of net present value of the project is found by multiplying together the last two columns above and totaling them as follows.

(c) The standard deviation is :

$$[0.2(-1,272-661)^2 + 0.3(-1,000-661)^2 + 0.05(1,550-661)^2 + 0.05(1,896-661)^2 + 0.15(2,259-661)^2 + 0.15(2,604-661)^2 + 0.05(2,967-661)^2 + 0.05(3,313-661)^2]^{1/2} = €1,805 \text{ thousands}$$

Thus, the dispersion of the probability distribution of possible net present values is very wide. In turn, this is due to 50 percent probability of a zero outcome or less.

15. The input variables are:

S = Rs.27.00; X = Rs. 25.00; r_{RF} = 6.0%; t = 6 months = 0.5 years; and σ^2 = 0.11

Now, we proceed to use the OPM:

$$V = Rs.27[N(d_1)] - Rs.25e^{-(0.06)(0.5)}[N(d_2)]$$

$$d_1 = \frac{\ln\left(\frac{S}{X}\right) + \left(r + \frac{\sigma^2}{2}\right)T}{\sqrt{T}} \text{ and } d_2 = d_1 - \sqrt{T}$$

$$d_1 = \frac{\ln(Rs. 27/Rs. 25) + [(0.06 + 0.11/2)](0.5)}{(0.3317)(0.7071)}$$

$$= \frac{0.0770 + 0.0575}{0.2345} = 0.5736.$$

$$d_2 = d_1 - (0.3317)(0.7071) = d_1 - 0.2345$$

$$= 0.5736 - 0.2345 = 0.3391.$$

$$N(d_1) = N(0.5736) = 0.5000 + 0.2168 = 0.7168.$$

$$N(d_2) = N(0.3391) = 0.5000 + 0.1327 = 0.6327.$$

Therefore,

$$V = \text{Rs. } 27(0.7168) - \text{Rs. } 25e^{-0.03}(0.6327) = \text{Rs. } 19.3536 - \text{Rs. } 25(0.97045)(0.6327)$$

$$= \text{Rs. } 19.3536 - \text{Rs. } 15.3500 = \text{Rs. } 4.0036 \approx \text{Rs. } 4.00.$$

Thus, under the OPM, the value of the call option is about Rs. 4.00.

16. According to put-call parity theorem

$$P_0 = C_0 + \frac{E}{e^{rt}} - S_0$$

$$= \text{€}14 + \frac{60}{e^{.08 \times .25}} - \text{€}70$$

$$= \text{€}14 + \frac{60}{1.0202} - \text{€}70 = \text{€}2.812$$

$$17. \quad u = 33.00/30.00 = 36.30/33.00 = 1.10 \quad d = 27.00/30.00 = 24.30/27.00 = 0.90$$

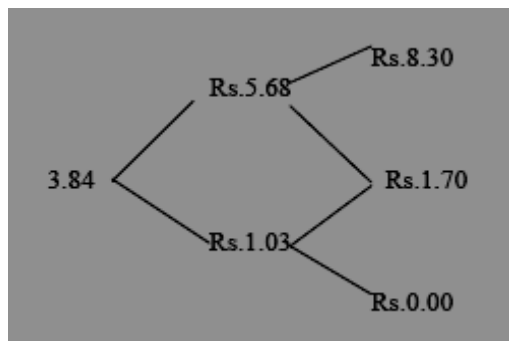
$$r = (1 + .05)^{1/2} = 1.0247$$

$$p = \frac{r-d}{u-d} = \frac{1.0247-0.90}{1.10-0.90} = 0.1247/0.20 = 0.6235$$

$$C_{uu} = \text{Max } [0, 36.30 - 28] = 8.30$$

$$C_{ud} = \text{Max } [0, 29.70 - 28] = 1.70$$

$$C_{dd} = \text{Max } [0, 24.30 - 28] = 0$$



$$C_U = \frac{(0.6235)(8.30) + (0.3765)(1.70)}{1.025} = \frac{5.175 + 0.64}{1.025} = 5.815/1.025 = \text{Rs. } 5.675$$

$$C_U = \frac{(0.6235)(1.70) + (0.3765)(0.00)}{1.025} = \frac{1.05995}{1.025} = \text{Rs. } 1.0340$$

$$C_U = \frac{(0.6235)(5.675) + (0.3765)(1.0340)}{1.025} = \frac{3.538 + 0.3895}{1.025} = \text{Rs. } 3.83$$

$$h = (33.00 - 27.00) / (5.68 - 1.03) = 6.00 / 4.65 = 1.29$$

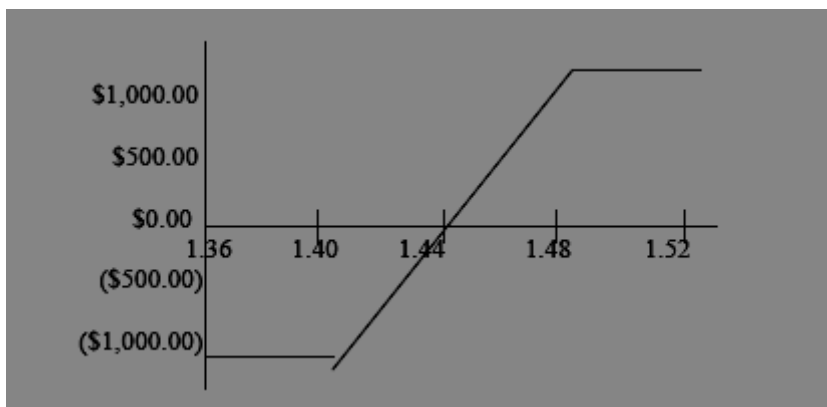
18. (a) Initial Cost

	<u>Cost/Contract</u>	<u>x 31,250</u>
long 1.44 Call	0.0422	(\$1,318.75)
short 1.48 Call	0.0255	\$ 796.88
long 1.40 Put	0.0260	(\$ 812.50)
short 1.44 Put	0.0422	<u>\$1,318.75</u>
		<u>(\$ 15.62)</u>

June	Net Initial	Long Call	Short Call	Long Put	Short Put	Total Net
USD/GBP	Cost	1.44 Profit	1.48 Profit	1.40 Profit	1.44 Profit	Profit
1.36	(\$15.62)	0	0	1250	-2500	(\$1,265.62)
1.40	(\$15.62)	0	0	0	-1250	(\$1,265.62)
1.44	(\$15.62)	0	0	0	0	(\$15.62)
1.48	(\$15.62)	1250	0	0	0	\$1,234.38
1.52	(\$15.62)	2500	-1250	0	0	\$1,234.38

Example: Long Call 1.44 profit = $(1.48 - 1.44) \times 31,250 = \1250

(b)



This position resembles a bull vertical spread. The purchaser of this portfolio is probably moderately bullish on the exchange rate. We see this from the willingness to give up the extreme upside in exchange for limiting the downside.

(c) This is a simple application of put-call parity

$$C - P = R * \exp(-rf * dt) - X * \exp(-rd * dt)$$

where R is the exchange rate (1.385), X is the exercise price (1.44)

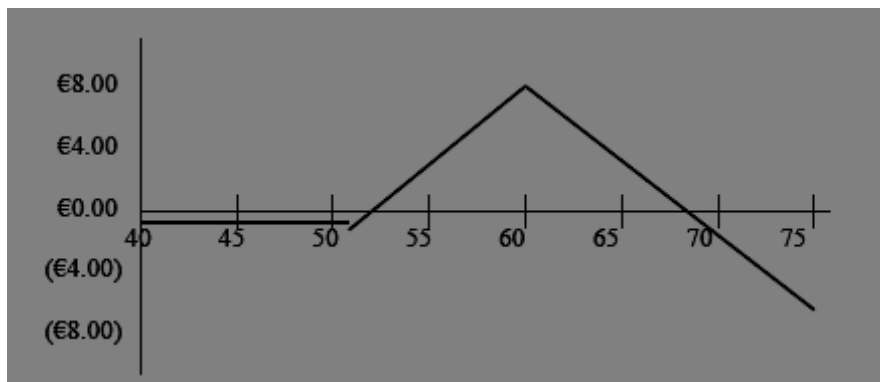
rd (rf) is the domestic (foreign) risk-free rate,

dt is the time to expiration.

$$C - P = 1.385 * \exp(-.07 * .1667) - 1.44 * \exp(-.05 * .1667) = (\$0.0591)$$

19. (a)	Price of MGH Stock at Expiration	Initial Cost	Profit on Call #1 Position	Profit on Call #2 Position	Net Profit on Total Position
	40	(€1.72)	€0.00	€0.00	(€1.72)
	45	(€1.72)	€0.00	€0.00	(€1.72)
	50	(€1.72)	€0.00	€0.00	(€1.72)
	55	(€1.72)	€5.00	€0.00	€3.28
	60	(€1.72)	€10.00	€0.00	€8.28
	65	(€1.72)	€15.00	(€10.00)	€3.28
	70	(€1.72)	€20.00	(€20.00)	(€1.72)
	75	(€1.72)	€25.00	(€30.00)	(€6.72)

(b)



Breakeven points are \$51.72 and \$68.28. Maximum profit occurs at \$60.

Maximum profit occurs when the short calls are at-the-money; at prices above \$60, the losses on the short calls reduce profit.

Breakeven on the low side occurs at the long call strike price (\$50) plus sufficient stock price increase to cover the position's cost (\$1.72). This equals \$51.72.

Breakeven on the high side occurs with the position's cost (\$1.72), profit on the call (P-\$50), and loss of the short calls 2(\$60-P) equal zero: (P-\$50) + 2(\$60-P) - \$1.72 = 0 which occurs when price = \$68.28

- (c) The user of this position is betting on low volatility (that prices will stay between breakeven points). The holder has limited liability for substantial price declines and unlimited liability for substantial price increases.

$$20. \frac{\text{Futures price}}{(1 + \text{Risk-free rate})^1} = \frac{\text{Spot price} + \text{Present value of storage costs} - \text{Present value of convenience yield}}{1}$$

$$\frac{10,800}{(1.12)^1} = 10,000 + 500 - \text{Present value of convenience yield}$$

Hence the present value of convenience yield is \$857.14 per ton.

21. (a)

Security	Expected Return	Beta (β)	Required Return = 0.08 + 0.04β	Under Valued Security
O	0.32	1.70	0.148	UVS
P	0.30	1.40	0.136	UVS
Q	0.25	1.10	0.124	UVS
R	0.22	0.95	0.118	UVS
S	0.20	1.05	0.122	UVS
T	0.14	0.70	0.108	UVS

UVS = Under Valued Security

All the securities listed above are undervalued because their expected returns plot above the SML.

(b) (i) Expected return on the portfolio

$$= \frac{1}{6} (0.32 + 0.30 + 0.25 + 0.22 + 0.20 + 0.14) = 0.2383$$

(ii) Expected return on the portfolio

$$R_P = X R_M - (X - 1) R_P$$

$$= (1.4) (0.2383) - (0.4) (0.12) = 0.33362 - 0.048 = 0.28562$$

22. (a) Method I

Portfolio's return

$$\text{Small cap growth} = 4.5 + 0.80 \times 6.85 + 1.39 \times (-3.5) + 1.35 \times 0.65 = 5.9925\%$$

$$\text{Small cap value} = 4.5 + 0.90 \times 6.85 + 0.75 \times (-3.5) + 1.25 \times 0.65 = 8.8525\%$$

$$\text{Large cap growth} = 4.5 + 1.165 \times 6.85 + 2.75 \times (-3.5) + 8.65 \times 0.65 = 8.478\%$$

$$\text{Large cap value} = 4.5 + 0.85 \times 6.85 + 2.05 \times (-3.5) + 6.75 \times 0.65 = 7.535\%$$

Expected return on market index

$$0.10 \times 8.8525 + 0.25 \times 5.9925 + 0.15 \times 7.535 + 0.50 \times 8.478 = 7.7526\%$$

Method II

Expected return on the market index

$$= 4.5\% + [0.1 \times 0.9 + 0.25 \times 0.8 + 0.15 \times 0.85 + 0.50 \times 1.165] \times 6.85 + [(0.75 \times 0.10 + 1.39 \times 0.25 + 2.05 \times 0.15 + 2.75 \times 0.5)] \times (-3.5) + [(1.25 \times 0.10 + 1.35 \times 0.25 + 6.75 \times 0.15 + 8.65 \times 0.50)] \times 0.65$$

$$= 4.5 + 6.85 + (-7.3675) + 3.77 = 7.7525\%.$$

(b) Using CAPM,

$$\text{Small cap growth} = 4.5 + 6.85 \times 0.80 = 9.98\%$$

$$\text{Small cap value} = 4.5 + 6.85 \times 0.90 = 10.665\%$$

$$\text{Large cap growth} = 4.5 + 6.85 \times 1.165 = 12.48\%$$

$$\text{Large cap value} = 4.5 + 6.85 \times 0.85 = 10.3225\%$$

Expected return on market index

$$= 0.10 \times 10.665 + 0.25 \times 9.98 + 0.15 \times 10.3225 + 0.50 \times 12.45 = 11.33\%$$

(c) Let us assume that Mr. Nirmal will invest $X_1\%$ in small cap value stock and $X_2\%$ in large cap growth stock

$$X_1 + X_2 = 1$$

$$0.90 X_1 + 1.165 X_2 = 1$$

$$0.90 X_1 + 1.165(1 - X_1) = 1$$

$$0.90 X_1 + 1.165 - 1.165 X_1 = 1$$

$$0.165 = 0.265 X_1$$

$$\frac{0.165}{0.265} = X_1$$

$$0.623 = X_1, X_2 = 0.377$$

62.3% in small cap value

37.7% in large cap growth.

23.

Classic (R_i)	Market Index (R_m)	T-bills (R_p)	$R_i - R_p$	$R_m - R_p$
17.1	10.8	5.4	11.70	5.4
-14.6	-8.5	6.7	-21.30	-15.20
1.7	3.5	6.5	-4.8	-3.00
8.0	14.1	4.3	3.7	9.8
11.5	18.7	4.1	7.4	14.6
-5.8	-14.5	7.0	-12.8	-21.5
-15.6	-26.0	7.9	-23.5	-33.9

38.5	36.9	5.8	32.7	31.1
33.2	23.6	5.0	28.2	18.6
-7.0	-7.2	5.3	-12.3	-12.5
2.9	7.4	6.2	-3.3	1.2
27.4	18.2	10.0	17.4	8.2
23.0	31.5	11.4	11.6	20.1
-0.6	-4.9	14.1	-14.7	-19.0
21.4	20.4	10.7	10.7	9.7
Average 9.406	Average 8.267	Average 7.36		
Standard	Standard Deviation	Standard		
Deviation 16.40	17.126	Deviation 2.815		

Sharpe's measure index

$$S = R_p - R_f/\sigma_p$$

Where,

R_p = Average Return on portfolio

R_f = Risk-free rate of return

σ_p = Standard deviation of portfolio

Classic Mutual Fund- $S_p = R_p - R_f/\sigma_p = 9.407 - 7.360/16.4 = 0.125$

Market Index- $S_p = R_m - R_f/\sigma_m = 8.267 - 7.360/17.126 = 0.053$

Classic Mutual Fund is better on the basis of the Sharpe's measure.

Treynor's measure

$$T = R_p - R_f/\beta_p$$

β_p = Beta value of portfolio.

Using regression technique to find Beta

$$b = \frac{\sum xy - n\bar{x}\bar{y}}{\sum x^2 - n\bar{x}^2}$$

After making calculation by taking Market Index as (x) and Classic Mutual Fund as (y) the values are

Market Index (x)	(x) ²	Classic (y)	(y) ²	(xy)
10.8	116.64	17.1	292.41	184.68
-8.5	72.25	-14.6	213.16	124.1
3.5	12.25	1.7	2.89	5.95
14.1	198.81	8.0	64.00	112.8
18.7	349.69	11.5	132.25	215.05
-14.5	210.25	-5.8	33.64	84.1

-26.0	676.00	-15.6	243.36	405.6
36.9	1361.61	38.5	1482.25	1420.65
23.6	556.96	33.2	1102.24	783.52
-7.2	51.84	-7.0	49.00	50.4
7.4	54.76	2.9	8.41	21.46
18.2	331.24	27.4	750.76	498.68
31.5	992.25	23.0	529.00	724.5
-4.9	24.01	-0.6	0.36	2.94
20.4	416.16	21.4	457.96	436.56

$\Sigma x^2 = 5424.72$	$\bar{y} = 9.406$
$\Sigma y = 141.1$	$\bar{x} = 8.267$
$\Sigma y^2 = 5361.69$	$n=15$
$\Sigma xy = 5070.99$	

Substituting values in the above equation

$$b = \frac{5070.99 - 15 \times 9.406 \times 8.267}{5424.72 - 15 \times (8.267)^2} = \frac{3904.59}{4399.57} = 0.88$$

$$a = \bar{y} - b\bar{x} = 9.406 - 0.88 \times 8.267 = 2.13.$$

From above calculation Beta value of security = 0.88

Treynor's measure of Classic Mutual Fund - $T_1 = 9.407 - 7.360/0.88 = 2.32$

Treynor's measure of Market Index- $T_m = 8.267 - 7.360/1.00 = 0.907$

Jensen's performance measure

$$\bar{R}_{jt} - R_{it} = \alpha_j + \beta_j (\bar{R}_{mt} - R_{it})$$

Where,

$\bar{R}_{jt}$ = Average return on portfolio j for period t

R_{it} = Risk less rate of interest for period t

α_j = Intercept that measures the forecasting ability of the portfolio manager

β_j = A measure of systematic risk

$\bar{R}_{mt}$ = Average return of a market portfolio for period t.

Substituting values in the above equation = $9.406 - 7.360 = \alpha_j + 0.88 (8.267 - 7.360)$

$$\alpha_i = 2.046 - 0.798 = 1.248$$

24. Risk appetite, risk aversion and risk premium are sometimes used interchangeably. They are, however, distinctly different. Risk aversion is an intrinsic attribute of investors that leads to the tendency to avoid risk unless adequately compensated. In simple terms, it is the degree to which investors abhor uncertainty surrounding their investment.

Risk appetite is the willingness to bear risk. It consists of two components. One is the degree to which investors dislike the associated uncertainty and the other component is the level of that uncertainty.

Risk premium is the reward for holding a risky investment rather than a risk-free one. It measures the additional returns that investors require to hold assets whose returns are more variable than those of low risk ones.

When investors are unwilling to tolerate risk, they require higher returns for bearing risk. An uncontrollable surge in investor risk appetite can plunge the financial markets into crisis. On the other hand, collapse of investor appetite for risk will dampen the markets. When investor risk appetite increases and shifts towards riskier assets, their prices shoot up, as compared to the less risky ones. One can observe a price rise in low risk assets relative to riskier investments when sentiments across the market are of diminishing risk appetite.

Investors with a high risk appetite will invest in aggressive equity instruments in high risk/high reward sectors. The probability of losing money is as high as is the probability of reaping rewards. Those with a low risk appetite opt for debt instruments. Between the two extremes is the category of investors who take moderate risk. Balanced funds or a mix of equity and debt in their portfolio is best-suited for them.

Sharpe ratio characterises how well the returns of an asset compensates the investor for the risk he takes. It is the ratio of a portfolio's total returns minus the risk-free rate divided by standard deviation of the portfolio. It is a measure of performance of the portfolio in return for bearing risk. Hence, a higher Sharpe ratio implies greater rewards for taking additional risks. The ratio measures a portfolio's risk-return trade-off, and helps the investor decide if the investment is worth the risk.

25. (i) Although EVA is used primarily for evaluating management performance, it also is being used by external analysts to evaluate management with the belief that superior internal performance should be reflected in a company's stock performance. Several studies have attempted to determine the relationship between the two variables (EVA and MVA), and the results have not been encouraging. Although the stock of firms with positive EVAs has tended to outperform the stocks of negative EVA firms, the differences are typically insignificant and the relationship does not occur every year. This poor relationship may be due to the timing of the analysis (how fast EVA is reflected in stocks) or because the market values (MVAs) are affected by factors other than EVA—for example, MVA can be impacted by market interest rates and by changes in future expectations for a firm not considered by EVA—that is, it appears that EVA does an outstanding job of evaluating management's past performance in terms of adding value. While one would certainly hope that superior past performance will continue, there is nothing certain about this relationship.

- (ii) Home loan repayments are huge commitments that most families face. Sometimes, there is a huge difference in interest rate between what the borrower currently pays his bank and what another lender offers. In such a scenario, people consider either prepaying their loan or switching the lender. Switching to another lender offering better rates is called balance transfer.

Expenses involved

A balance transfer of the outstanding loan from one bank to another can result in savings of a few thousand rupees, month after month in your EMIs. Borrowers must exert due diligence before exploring the balance transfer option. The existing lender charges a penalty for prepayment and the new lender may seek processing fees. These expenses must be taken into account while weighing the benefits of a balance transfer. Some lenders may levy additional switching charges that must be taken into account as well.

When it works well for you

It makes sense to go ahead with a balance transfer if your net gain is more than one percent. This is after factoring in the prepayment penalty of two percent and loan processing charge of 0.5 to one percent. Since lower rates are applicable for a new borrower (rather than existing borrowers) shop for competitive rates and a good lender. After the switching exercise, you shouldn't get a rude jolt that the new lender has increased the rates. So find out if any rate hike is on the cards before switching.

- (iii) For longer –term hedging programmes, such as a two-year loan with three-monthly rollover dates, more complicated strategies can be adopted, such as 'stack hedging' and 'strip hedging'.

With a stack hedge, the total number of contract needed to hedge the loan are purchased for the month of the first rollover date. At that date, the remaining, number of contracts necessary are purchased for the next rollover date, and so on.

A strip hedge, on the other hand, treats each three-month segment of the loan as separate entity, and futures contracts are purchased for each rollover date at the outset of the loan.