# CA FINAL

## STRATEGIC FINANCIAL MANAGEMENT

### SUPER 100 PART 1

### Answers

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## Question 1.

a. Merger will be viable firm Aif –

($P_{AB}$> $P_A$)

Probability of ($P_{AB}$ > 22) should be >70%

($P_{AB}$ = Price after merger)

$\Rightarrow (P/E)_{AB} \times EPS_{PB}$ = 22 at least

$\Rightarrow (P/E)_{AB} \times 3$ = 22 at least

$(P/E)_{AB}$ ratio should be $\geq \frac{22}{3} \geq 7.33$

$$Z = \frac{x-u}{\sigma} = \frac{7.33-8}{2} = -0.34$$

Area in one tail (left tail) = .3632

∴Required Probability = 1 - .3632 $\Rightarrow$ .6368 = 64% (approx)

There is 64% chance price after merger will be > 22

but needed 70%

∴ Merger not acceptable.

b. Post merger EPS = [(120 + 45)/(35 + 2 × 10)] = 3
P/E ratio = 8
Post merger price = 24
Y is getting 2 shares which means it is getting 2×24 = 48 which is more than it's adjusting Price of 35. So, merger is viable for Y

c. As calculated above, Post-Merger Price = 24
NPV i.e. Gain to Y = (48 - 35) × 10 = 130cr

**Note : Extra Knowledge -**

NPV to x = $\left(1320 \times \frac{35}{55}\right) - (35 \times 22) = 70\text{cr}$

also as (24-22) × 35 = 70 cr
Value of synergy = 130 + 70 = 200 cr

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## Question 2.

a. A borrows floating at PLR + 3% and lends them to B at PLR + 3% and borrows from B at fixed 8.5%.
B borrows fixed at 10% and lends them to A at 8.5% and borrows floating from A at PLR + 3%.

b. Cost of funds to A = PLR + 3% – (PLR + 3%) + 8.5 = 8.5% .
Cost of funds to B = 10% – 8.5% + PLR + 3% = PLR + 4.5%.
Assuming expectations theory holds good. Cost of funds to B can be calculated as follows :

| Year | Expected annual PLR rates | Loading | Effective rates | Effective rate under cap |
|---|---|---|---|---|
| 1 | 5.0% | 4.5 | 9.5 | 9.50 |
| 2 | $[(1.055)^2 \div (1.05)] - 1 = 6.00\%$ | 4.5 | 10.5 | 10.50 |
| 3 | $[(1.065)^3 \div (1.055)^2] - 1 = 8.5\%$ | 4.5 | 13.0 | 11.25 |
| 4 | $[(1.07)^4 \div (1.065)^3] - 1 = 8.5\%$ | 4.5 | 13.0 | 11.25 |

Effective cost = $[1.095 \times 1.105 \times (1.1125)^2]^{1/4} - 1 = 0.1062$ i.e., 10.62% per annum.

## Question 3.

### Income Statement Projection

| | Current Figures | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | 5+ |
|---|---|---|---|---|---|---|---|
| Sales | 500.0 | 550.0 | 605.0 | 665.6 | 732.1 | 805.3 | 805.3 |
| Gross Margin (25%) | 125 | 137.5 | 151.3 | 166.4 | 183.0 | 201.3 | 201.3 |
| Selling & General Administrative (15%) | 75.0 | 82.5 | 90.8 | 99.8 | 109.8 | 120.8 | 120.8 |
| Profit before tax (10%) | 50.0 | 55.0 | 60.5 | 66.6 | 73.2 | 80.5 | 80.5 |
| Income tax (30%) | 15.0 | 16.5 | 18.2 | 20.0 | 22.0 | 24.2 | 24.2 |
| Net profit | 35.0 | 38.5 | 42.3 | 46.6 | 51.2 | 56.3 | 56.3 |

### Balance Sheet Projection

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Fixed Assets | 175 | 192.5 | 211.8 | 232.9 | 256.2 | 281.8 | 281.8 |
| Current Assets | 75 | 82.5 | 90.8 | 99.8 | 109.8 | 120.8 | 120.8 |
| Total Assets | 250 | 275.0 | 302.6 | 332.7 | 366.0 | 402.6 | 402.6 |

### Cash flow Projection

| Particulars | 1 | 2 | 3 | 4 | 5 | 5+ |
|---|---|---|---|---|---|---|
| a. NOPAT i.e. PAT | 38.5 | 42.3 | 46.6 | 51.2 | 56.3 | 56.3 |
| b. Capital Spending - Depreciation | 17.5 | 19.3 | 21.1 | 23.3 | 25.6 | 0 |
| c. Increase in Current Assets | 7.5 | 8.3 | 9 | 10 | 11 | 0 |
| d. FCFF (a - b - c) | 13.5 | 14.7 | 16.5 | 17.9 | 19.7 | 56.3 |

### Present value calculation

| | | | | | | |
|---|---|---|---|---|---|---|
| a. PV factor at 20% | 0.833 | 0.694 | 0.579 | 0.482 | 0.402 | - |
| b. PV | 13.5 × 0.833 =11.25 | 14.7 × 0.694 =10.20 | 16.5 × 0.579 = 9.55 | 17.9 × 0.482 = 8.63 | 19.7 × 0.402 = 7.92 | |
| c. Horizon value at the end of 5 years | | | | | 56.3/0.2 =281.5 | |

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So, PV of first 5 years = 47.55.

PV of horizon value = 113.13

Therefore, Post Strategy Value = 160.68

Pre Strategy Value = 35/0.2 = 175.

Value of the Strategy = 160.68 – 175 = (14.32)

Hence, the strategy is not viable.

## Question 4.

a. The value of the company Quantum Jump under both cases can be calculated as follows:

Rs.mn

| Year | | 1 | 2 | 3 | 4 | 5 | Total |
|---|---|---|---|---|---|---|---|
| Before Merger | Cash flows | 15.6 | 17.2 | 18.8 | 22.6 | 24.9 | |
| | C.V. | - | - | - | - | 239.9* | |
| After Merger | Cash flows | 20.3 | 24.4 | 29.6 | 35.9 | 42.8 | |
| | C.V. | - | - | - | - | 513.6** | |
| | PVIF @ 17% | 0.855 | 0.731 | 0.624 | 0.534 | 0.456 | |
| PV of CFs and C.V. | Before Merger | 13.34 | 12.57 | 11.73 | 12.07 | 120.75 | 170.46 |
| | After Merger | 17.36 | 17.84 | 18.47 | 19.17 | 253.72 | 326.56 |

* C.V. = 24.9 (1.06) / (0.17 – 0.06) = 239.9

** C.V. = 42.8 (1.08) / (0.17 – 0.08) = 513.6

The desired PV of cash flows to the management of M/s. Quantum Jump Ltd = Rs.170.46 × 1.2 = Rs.204.55 mn

Therefore, the ownership position required by shareholders of M/s. Quantum Jump Ltd. in the merged entity: i.e., OP = 204.55 / 326.56 = 0.6264.

Hence the maximum exchange ratio which will be acceptable to the shareholders of M/s. Quantum Jump Ltd. will be.

$$0.6264 = \frac{N_Q}{N_Q + ERN_U} = 20 / (20 + ER \times 10) \Rightarrow ER = 1.193$$

i.e., ER = 1.2 i.e., 6 shares of Quantum Jump for every 5 shares of Unique Products Ltd.

b. Ownership position of Unique Products Ltd: 1 – 0.6264 = 0.3736

Hence value of ownership = 0.3736 × 326.56 = Rs.122.003 mn

Since, it is less than Rs.125 mn which was before merger. Therefore, the merger proposition offered by Quantum Jump will not be acceptable to Unique Products.

## Question 5.

a.

i. Computation of tax rate

EBIT = 245 crore

Interest = 218.125 crore

PBT = 26.875 crore

PAT = 17.2 crore

Tax paid = 9.675 crore

Tax rate = 9.675 /26.875 = 0.36 =36%

ii. Computation for increase in working capital

Working capital (2000) = 44 crore

Increase in 2001 = $44 \times 0.08 = 3.52$ crore

It will continue to increase @ 8% per annum.

iii. Weighted average cost of capital

Present debt = 1934 core

Interest cost = 218.125 crore / 1934 = 11.28 %

Equity capital = 75 crore × Rs. 66 = 4950 crore

$$Kc = \frac{4950}{1934+4950} \times 16\% + \frac{1934}{1934+4950} \times 11.28(1-0.36)$$

$$= 11.51 + 2.028 = 13.54$$

iv. As capital expenditure and depreciation are equal, they will not influence the free cash flows of the company.

v. Computation of free cash flows upto 2003

| Year | 2001 | 2002 | 2003 | 2004 | 2005 |
|---|---|---|---|---|---|
| EBIT (1-t) | 169.344 crore | 182.89 crore | 197.52 crore | 213.32 crore | 230.39 crore |
| Increase in working capital | 3.52 crore | 3.80 crore | 4.11 crore | 4.43 crore | 4.79 crore |
| Debt repayment | – | – | – | – | 1934 × 0.30 =580.2 crore |
| Free cash flows | 165.824 crore | 179.09 crore | 193.41 crore | 208.89 crore | –354.6 crore |
| PV of free cash flow @ 13.54% | 146.10 crore | 138.97 crore | 132.10 crore | 125.75 crore | -187.93 crore |

Present value of free cash flows upto 2005 = 354.99 crore

vi. Cost of capital

Debt = 0.7 · 1934 = 1353.8 crore

Equity = 4950 crore

$$Kc = \frac{4950}{4950+1353.8}\times 16\% + \frac{1353.8}{4950+1353.8}\times 13.54(1-0.36)$$

$$= 12.56 + 1.86 = 14.42\ \%$$

vii. Continuing value

$$= \frac{240.336}{0.1442-0.06}\times (1/1.1354)^5$$

$$= 1512.735 \text{ crore}$$

Value of the firm = PV of free cash flows upto 2005 + continuing value – Market value of outstanding debt

= 354.99 crore + 1512.735 – 1353.8 = 513.925 crore

b. Value per share = 513.925 / 75 = 6.852 < Rs. 66 (present market price)

Therefore, the share price is overvalued in the market.

## Question 6.

a. Purchase price premium

Purchase price premium

= Offer price for target company stock/target company market price per share

= Rs.85.50/ Rs. 75.30

= 1.1354 or 13.54% (i.e., 1.1354-1)

b. Exchange ratio

Price per share offered for the target company /market price per share for the acquiring company = Rs. 85.50/Rs. 65.50 = 1.305

So CDE issues 1.305 of stock for each share of RZB's stock.

c. Post merger EPS of the united company

New shares issued by the CDE Ltd.

= Exchange ratio × shares of RZB (target company)

= 1.305 × 25,000 = 32,625 Total shares outstanding of the combined company

= 1,20,000+32,625 = 1,52,625

Post merger EPS of the combined companies

= [20.50+15.65 = 36.15 lakh] / 1,52,625 = Rs. 23.685

d. Post merger share price

Premerger EPS of CDE Ltd. = 20.5 lakh/1,20,000 = Rs.17.083

Premerger P/E = Premerger price per share / premerger earning per share

= Rs. 65.50/ Rs.17.083 = Rs. 3.834

Post merger share price = Post merger EPS × Premerger P/E

= 23.685 × 3.834 = Rs.90.81

e. Post merger equity ownership distribution

| | | |
|---|---|---|
| RZB Ltd. | 32,625/1,52,625 | 21.376% |
| CDE Ltd. | 100 – 21.376% | 78.624% |
| | | 100% |

## Question 7.

| Year | Cash Flows (Amount in lakh) | Discount Rate (%) | Present Value (Amount in lakh) |
|---|---|---|---|
| 1 | (-) 7.5 | $1.15^{1}$ | (-) 6.52 |
| 2 | (-) 4 | $1.15^{2}$ | (-) 3.02 |
| 3 | 6 | $1.15^{3}$ | 3.95 |
| 4 | 8 | $1.15^{4}$ | 4.57 |
| 5 | 10 | $1.15^{5}$ | 4.97 |
| | | Total | 3.95 |

$$\text{Terminal value} = \frac{[10\text{ lakh} \times (1+0.04)]/[0.10-0.04]}{1.15^5} = 10.4 / (0.06 \times 1.15^5)$$

= 86.177 lakh

Minimum price = 86.177 + 3.95 = 90.127lakh

Maximum price = 90.127 + 18 = 108.127 lakh

## Question 8.

BPS = [Total assets – Total liabilities – Goodwill]/ No. of outstanding shares

Total assets = 30 + 120 = 150 lakh

Total liabilities = 45 + 20 = 65 lakh

BPS = [150 – 65 – 20] / 5.1

= 12.745 lakh

So the Implied Market Value Per Share = 12.745 · 4 = 50.98 lakh

## Question 9.

**Estimation of Cost of Acquisition (Payment basis)**

| | | |
|---|---|---|
| Debentures | | 4,40,000 |
| Current Liabilities: | | 1,25,000 |
| Cash | 11 x 50,000 | 5,50,000 |
| Shares | 12 x 50,000 | 6,00,000 |
| Payment of Good Will | | 2,00,000 |
| Dissolution expenses (50000/2) | | 25,000 |
| | | 19,40,000 |
| Less: Realization | | |
| Inventories | 2,00,000 | |
| Debtors | 1,00,000 | |
| Cash | 75,000 | 3,75,000 |
| | | 15,65,000 |

**Determination on Net Present Value**

| Year | Cash Flows | PV Factor @12% | Total PV |
|---|---|---|---|
| 1-5 | 2,50,000 | 3.605 | 9,01,250 |
| 6 | 16,50,000 | 0.507 | 8,36,550 |
| | | | 17,37,800 |
| Less: Cost of Acquisition | | | 15,65,000 |
| Net Present Value | | | 1,72,800 |

Since the net present value is positive it is advisable to go ahead with the acquisition proposal.

## Question 10.

a. Total market value = Rs.40,00,000 + Rs.45,00,000 = Rs.85,00,000
Total earnings = 4,50,000 + 5,25,000 = Rs.9,75,000
Earnings per share of the merged firm is Rs.3.5
Therefore, the number of shares outstanding 9, 75,000/ 3.5 = 2,78,570
The market price per share is Rs 30.51 i.e. (85,00,000 / 2,78,570)
P/E of Alpha = 40/2.5 = 16
P/E of Beta = 36/ 4 = 9
P/E ratio of the merged firm = 8.72 i.e. (30.51/3.5)

(Rs.)

| | Alpha Inc. | Beta Inc. | Merged firm |
|---|---|---|---|
| Earnings per share | 2.5 | 4 | 3.5 |
| Price per share | 40 | 36 | 30.51 |
| Price-earnings ratio | 16 | 9 | 8.72 |
| Total earnings | 4,50,000 | 5,25,000 | 9,75,000 |
| Total market value | 40,00,000 | 45,00,000 | 85,00,000 |

b. Number of shares outstanding = Total Earnings / Earnings per share
Alpha Inc. = 4,50,000 / 2.5 = 1,80,000
Beta = 5,25,000/ 4 = 1,31,250
Merged Firm = 9,75,000/3.5 = 2,78,570
Alpha Inc. had issued 98,570 i.e. (2,78,570 – 1,80,000) additional shares in order to takeover Beta Inc.
which had 1,31,250 shares outstanding.
Thus, Rate of exchange of shares = 98,570 /1,31,250 = 0.75 i.e
0.75 shares of Alpha Inc. were exchanged for each share of Beta Inc.
Thus the exchange ratio = 0.75

c. Alpha paid a total of Rs.30,07,370 i.e. (98,570 x 30.51) for something that was worth Rs.28,00,000.
Thus, the cost of acquisition is 30,07,370 – 28,00,000 = Rs.2,07,370.

## Question 11.

| | Aqua | Indigo | Pacific | Average |
|---|---|---|---|---|
| Market value/ Replacement value | 0.833 | 0.727 | 0.92 | 0.827 |
| Market value / sales | 1 | 0.769 | 0.766 | 0.845 |
| Market value/ Book value | 1.25 | 1 | 1.533 | 1.261 |
| Market to after tax EBIT | 13.89 | 12.5 | 16.43 | 14.27 |

Application of ratios of the comparable firms to Atlantic

| | Atlantic | Average | Indicated Value of Equity |
|---|---|---|---|
| Revenues | 275 | 0.845 | 232.38 |
| BV to Equity | 200 | 1.261 | 252.20 |
| Net income | 15 | 14.27 | 214.05 |
| Replacement Cost | 250 | 0.827 | 206.75 |
| | | Average | 226.34 |

Market value of equity of Atlantic ltd according to comparable company method = Rs.226.34 lakhs.

## Question 12.

| | Green | Blue | No. Synergy | With Synergy |
|---|---|---|---|---|
| Revenues | 3,281 | 4,620 | 7,901 | 7,901 |
| – COGS | 2,920 | 4,043 | 6,963 | 6,795 |
| – Dep | 74 | 200 | 274 | 274 |
| = EBIT | 287 | 378 | 664 | 832 |
| EBIT (1 – t) | 187 | 245 | 432 | 541 |
| – Change in WC | 16 | 22 | 38 | 38 |
| FCFF | 171 | 223 | 394 | 503 |
| Cost of Equity | 12.50% | 12.50% | 12.50% | 12.50% |
| Cost of Debt | 5.53% | 5.53% | 5.53% | 5.53% |
| WACC | 11.38% | 11.98% | 11.73% | 11.73% |
| Firm Value | 2,681 | 3,199 | 5,879 | 7,479 |

Synergy Gain = 7479 -5879 = 1,600

Note: Firm Value = FCFF1 / (WACC – g)

## Question 13.

To find the value of X's equity shares, subtract the debt of Rs.42 lakh from the total value.

| X | Recession | Slow growth | Rapid growth |
|---|---|---|---|
| Equity | (4) | 10 | 30 |
| Debt | 42 | 42 | 42 |
| Total | 38 | 52 | 72 |

There is a negative value of equity in recession, which is not possible because the shares have limited liability. Hence, we will assume that the shares are zero value and the debt has declined to Rs.38 lakhs because of bankruptcy risk. Therefore the expected value of equity and debt can be calculated as follows:

| X | Recession | Prob | Slow growth | Prob | Rapid growth | Prob | Expected value |
|---|---|---|---|---|---|---|---|
| Equity | 0 | 0.20 | 10 | 0.55 | 30 | 0.25 | 13.0 |
| Debt | 38 | 0.20 | 42 | 0.55 | 42 | 0.25 | 41.2 |
| Total | 38 | 0.20 | 52 | 0.55 | 72 | 0.25 | 54.2 |

To find the value of Y Ltd's equity shares subtract debt of Rs.8 lakhs from the total value.

| X | Recession | Prob | Slow growth | Prob | Rapid growth | Prob | Expected value |
|---|---|---|---|---|---|---|---|
| Equity | 52 | 0.20 | 67 | 0.55 | 107 | 0.25 | 74 |
| Debt | 8 | 0.20 | 8 | 0.55 | 8 | 0.25 | 8 |
| Total | 60 | 0.20 | 75 | 0.55 | 115 | 0.25 | 82 |

When the two companies merge we have to add the economic values of equity and debt together. Since the bankruptcy risk is disappeared by combining with a low geared company the negative Rs.4 lakhs also has to used while calculating the combined firm's expected value.

| X | Recession(0.2) | Slow growth(0.55) | Rapid growth(0.25) | Expected value |
|---|---|---|---|---|
| Equity | 48 | 77 | 137 | 86.2 |
| Debt | 50 | 50 | 50 | 50.0 |
| Total | 98 | 127 | 187 | 136.2 |

| Expected equity values | | Expected debt values | |
|---|---|---|---|
| X | 13 | X | 41.2 |
| Y | 74 | Y | 8.0 |
| Total | 87 | Total | 49.2 |
| Combined firm loss in capital | 0.8 | Increase in debt | 0.8 |

After the combination, in the absence of synergy, the total economic value of the business remains at Rs.136.2 lakhs but the expected value or debt has increased by 0.8 lakhs at the expense of equity. Because, under the recession there is no longer a bankruptcy risk for the debt holders of X Ltd.

The cash flows of the combined company may reduce in volatility because of the portfolio effect and this may further reduce the cost of debt, increasing its value.

## Question 14.

Earnings of Venus Ltd.

a. Before the acquisition of Mercury ltd.

$$\text{Earnings per share} = \frac{7,50,000}{1,00,000} = 7.5$$

$$\text{Assets per share} = \frac{12,50,000}{1,00,000} = 12.5$$

b. Mercury ltd's EPS

$$= \frac{2,00,000}{50,000} = \text{Rs.4}$$

The company is being bought at Rs.20 per share. If otherwise mean that, the company is being bought on a multiple of $5\left(\text{PE} = \frac{\text{MPS}}{\text{EPS}} = \frac{20}{4}\right)$. As the takeover consideration is being satisfied by shares,

Venus ltd's earnings will be diluted because it is valuing Mercury Ltd on a higher multiple of earnings than itself. Venus will have to issue 33,333 shares valued at Rs.30 each (MPS= EPS x 4 = 7.5 x 4) to satisfy the 10, 00,000 consideration

$$\text{EPS} = \frac{7,50,000+2,00,000}{1,00,000+33,333}$$

$$= \frac{9,50,000}{1,33,333} = 7.125$$

$$\text{APS} = \frac{30,00,000}{1,33,333} = 22.5$$

c. The shareholders of Mercury Ltd would receive 33,333 share in Venus ltd in exchange for 50,000 shares, i.e. $\left(\text{exchange ratio} = \frac{33,333}{50,000} = \frac{2}{3}\right)$ two shares in Venus for every three shares currently held.

| | |
|---|---|
| (i) Earnings | |
| Three shares in Mercury earn (3 × 4) | 12 |
| Two shares in Venus will earn (2 × 7.125) | 14.25 |
| Increase in earnings per three shares held in Mercury | 2.25 |
| (ii) Assets | |
| Three shares in Mercury have an asset backing of (3 × 35) | 105 |
| Two shares in Venus will have an asset backing (2 × 22.5) | 45 |
| Loss in asset backing per three shares help in Mercury | 60 |

The shareholders in Mercury Ltd would be trading asset backing for an increase in earnings.

## Question 15.

a.

**i. Post merger share price = Post merger EPS × Premerger P/E.**

$$\text{Exchange Ratio} = \frac{\text{Price per share offered for Target Company}}{\text{Market Price per share of the acquiring company}}$$

$$= \frac{\text{Rs.}84.30}{\text{Rs.}56.25} = 1.5$$

Acquiring company issues 1.5 shares of stock for each share of target company stock.

New shares issued by Acquiring Company = Shares of Target Company · Exchange Ratio = 18750 · 1.5 = 28,125.

Total shares outstanding of the combined companies = Acquiring company shares + New shares of Target Company

112000 + 28125 = 140125.

Post merger EPS of the combined companies

$$= \frac{\text{Earnings available for common stock of acquiring company} + \text{Earning available of target company}}{\text{Total shares outstanding of combined companies after acquisition}}$$

$$= \frac{\text{Rs.}281500 + \text{Rs.}62500}{140125}$$

$$= \frac{\text{Rs.}344000}{140125} = \text{Rs.}2.46.$$

Premerger EPS of Escorts Multimedia =

$$\frac{\text{Earnings of company}}{\text{No. of shares of acquiring company}} = \frac{\text{Rs.}281500}{112000} = \text{Rs.}2.51.$$

$$\text{Premerger P/E} = \frac{\text{Premerger Price Per Share}}{\text{Premerger Earnings Per Share}}$$

$$= \frac{\text{Rs.}56.25}{\text{Rs.}2.51} = 22.4$$

Post merger share price = Post merger EPS · Premerger P/E

= Rs.2.46 × 22.4 = Rs.55.10

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**ii. Post merger equity ownership distribution**

Ownership of Prudential Advertising

$$\text{List} = \frac{\text{New shares received}}{\text{Total No. of shares outstanding of the combined companies}}$$

$$= \frac{28125}{140125} = 20.1\%$$

Ownership of acquiring company = (100 – 20.1%) = 79.9%.

**iii. Purchase price premium**

$$= \frac{\text{Offer price for target company stock}}{\text{Target company market price per share}}$$

$$= \frac{\text{Rs.84.30}}{\text{Rs.62.50}} = 1.35 \text{ or } 35\% \text{ (i.e., } 1.35 - 1.00)$$

b. The acquisition results in Rs.1.15 (Rs.56.25 – Rs.55.10) reduction in the share price of the acquiring company due to a Rs.0.05 (Rs.2.51 – Rs.2.46) decline in EPS of the combined companies. (Recall that acquiring company assumed no gains in earnings of the combined companies due to synergy) whether the acquisition is a poor decision depends upon what happens to the earnings of the combined companies over time. If the combined companies earnings grow more rapidly than the acquiring company's earnings would have in the absence of the acquisition, the acquisition may contribute to the market value of the acquiring company.

## Question 16.

a. Maximum exchange ratio from the point of the shareholders of Harrison corporation

$$ER_1 = \frac{-S_1}{S_2} + \frac{PE_{12}(E_{12})}{P_1 S_2}$$

$$= \frac{-20}{10} + \frac{12 \times 70}{30 \times 10} = 0.80$$

b. Minimum exchange ratio from the point of the shareholders of Erricson Corporation

$$ER_2 = \frac{P_2 S_1}{(PE_{12})(E_{12}) - P_2 S_2}$$

$$= \frac{20 \times 20}{11 \times (70 \times 1.05) - 20 \times 10}$$

$$= \frac{400}{808.5 - 200} = 0.657.$$

c. Assuming that there is no synergy gain, the lines ER1 and ER2 will intersect at the weighted average of the two P/E multiples, wherein the weights correspond to the respective earnings of the two firms.

$$PE_{12} = \frac{50}{70} PE_1 + \frac{20}{70} PE_2$$

$$= \frac{50}{70} \times 12 + \frac{20}{70} \times 10 = 11.43.$$

## Question 17.

a. **Step 1 - Deleveraging :**

Asset Beta = 1.10/(1+(25/75)×0.8) = 0.868

**Step 2 - Releveraging**

$\beta_L$ =0.868[1 + (1 - 0.4)(0.4 / 0.6)] = 1.215

$k_e$ = 5.6% + 1.215(12% - 5.6%) = 13.376%

b. $CF_1$ = Rs.12,00,000

$CF_2$ = Rs.14,00,000

$CF_3$ = Rs.16,50,000

$CF_4$ = Rs.18,00,000

TV = $\frac{\text{Rs.18,00,000 } 1.05}{0.13376-0.05}$ = Rs. 22,564,469.91 at t = 4

I = 13.376%

PV of CF = Rs. 1,80,25,702.86

c. Maximum offering price

= Rs.1,80,25,702.86 / 12,00,000 = Rs.15.02.

Obviously, if the tender offer is accepted at this price, EST has paid the maximum amount that could've been paid such that NPV of the acquisition for EST = 0. Hence, EST share price will not be affected. However, if EST can negotiate a lower price, we can expect EST share price to rise.

## Question 18.

a. The value of the company M/s Gillete Financial Services Ltd., under both cases can be calculated as follows:

(Rs. in lakhs)

| Year | | 1 | 2 | 3 | 4 | 5 | Total |
|---|---|---|---|---|---|---|---|
| Before merger | Cash flows | 22.6 | 23.4 | 23.9 | 24.6 | 25.2 | |
| | CV | – | – | – | – | 299.60* | |
| After merger | Cash flows | 23.1 | 24.0 | 24.8 | 25.3 | 26.2 | |
| | CV | – | – | – | – | 407.97** | |
| PV of CFs and CV | PVIF@16% | 0.862 | 0.743 | 0.641 | 0.552 | 0.476 | |
| | Before Merger | 19.48 | 17.39 | 15.32 | 13.58 | 154.61 | 220.38 |
| | After Merger | 19.91 | 17.83 | 15.90 | 13.97 | 206.66 | 274.27 |

* $CV = \frac{25.2(1.07)}{(0.16-0.07)} = \frac{26.964}{0.09} = 299.60$

** $CV = \frac{26.2(1.09)}{0.16-0.09} = \frac{28.558}{0.07} = 407.97$

The desired PV of cash flows to the management of Gillete Financial Services Ltd., = Rs220.38 × 1.17 = Rs.257.84

Therefore the ownership position required by shareholder of Gillete Financial Services Ltd., in the merged equity i.e.

$$\frac{Rs.257.84}{Rs.274.27} = Rs.0.9401$$

Hence the maximum exchange ratio which will be acceptable to the shareholders of Gillete Financial Services Ltd., will be

$$0.9401 = \frac{N_Q}{N_Q + ERXN_U} = \frac{18,00,000}{(18,00,000 + ER \times 7,00,000)}$$

$$ER = 0.1638$$

b. Ownership position of Elbit Chartered Ltd = 1 - 0.9401 = 0.0599

Hence, value of ownership = 0.0599 × 274.27 = Rs.16.43 lakhs

Since, it is less than Rs.105 lakh which was before merger.

Therefore, the merger proposition offered by Gillete Financial Services Ltd. will not be acceptable to Elbit Chartered Ltd.

## Question 19.

a. Unlevered beta for firms in same business

= 1.30/(1 + 0.65 × 0.2) = 1.15

Debt/equity ratio = Debt/Estimated market value of equity = $\frac{10}{30} = 33.33\%$

New levered beta for similar firms = 1.15 × (1 + 0.65 × 0.3333)

= 1.40 New cost of equity = 5.5% + (1.40 × 5.5%) = 13.2%

b. Pre-tax cost of debt = 10%

After tax cost of debt = 10% (1 - 0.35) = 6.5%

Cost of capital = 6.5% (0.25) + 13.2% (0.75) = 11.53%

c.

**i. Using the firm approach**

(Rupees in lakhs)

| Particulars | 1 | 2 | 3 | 4 | 5 | Terminal year |
|---|---|---|---|---|---|---|
| EBIT | 2.40 | 2.88 | 3.46 | 4.15 | 4.98 | 5.23 |
| – EBIT (1 – Tax rate) | 1.56 | 1.872 | 2.249 | 2.6975 | 3.237 | 3.3995 |
| – (Cap Ex-Depreciation) | 0.60 | 0.72 | 0.86 | 1.04 | 1.24 | 0.00 |
| FCFF | 0.96 | 1.152 | 1.389 | 1.6575 | 1.997 | 3.3995 |
| Terminal value | -- | -- | -- | -- | 52.06* | -- |

* Terminal value = $\frac{3.3995}{(0.1153-0.05)}$ = Rs.52.06 lakhs

Present value (Value of firm) @ 11.53% = $\frac{0.96}{1.1153}+\frac{1.152}{1.1153^2}+\frac{1.389}{1.1153^3}+\frac{1.6575}{1.1153^4}+\frac{1.997}{1.1153^5}$

$$= \frac{0.96}{1.1153}+\frac{1.152}{1.70}+\frac{1.389}{2.42}+\frac{1.6575}{3.07}+\frac{1.997+52.06}{3.65}$$

= 0.861 + 0.678 + 0.574 + 0.54 + 14.81

= Rs.17.463 lakhs

Value of equity = Rs.17.463 - Rs.10 lakh = Rs.7.463 lakhs

ii. **Using the equity approach**

(Rs. in lakhs)

| Particulars | 1 | 2 | 3 | 4 | 5 | Terminal year |
|---|---|---|---|---|---|---|
| Net Income | 0.75 | 0.94 | 1.17 | 1.46 | 1.83 | 1.98 |
| Less: (Cap. Exp – Dep) × (1 – Debt ratio) | 0.45 | 0.54 | 0.65 | 0.78 | 0.93 | 0.00 |
| FCFE | 0.30 | 0.40 | 0.52 | 0.69 | 0.90 | 1.98 |
| Terminal value | – | – | – | – | – | 20.41 |

$$\text{Terminal value of equity} = \frac{1.98}{(0.132-0.05)} = \text{Rs.24.146 lakhs}$$

Present value (Using cost of equity of 13.2%)

$$= \frac{0.30}{132}+\frac{0.40}{132^2}+\frac{0.52}{132^3}+\frac{0.69}{132^4}+\frac{0.90+20.41}{132^5}$$

$$= \frac{0.30}{132}+\frac{0.40}{1.664}+\frac{0.52}{2.353}+\frac{0.69}{2.962}+\frac{25.046}{3.50}$$

$$= 0.265 + 0.240 + 0.221 + 0.233 + 7.156$$

Present value = Rs.8.115 lakhs.

## Question 20

The customer gets Rs.59.00 lacs if he relies on the rate of Rs.5.90 / Skr quoted by the foreign bank. Since he approached his banker (a private sector bank), the rate quoted by him is to be compared with the rate quoted by the foreign bank.

The dealer of the private sector bank can cover his position either in Bahrain or Singapore market.

I. If the dealer covers the transaction through Singapore market:

Sell 1million Swedish Kroner at the rate of 7.9662 and acquire dollars and sell the dollars in

Mumbai at the buying rate of Rs.47.20 / $. The exchange margin of 0.005 paise is to be deducted.

$$
\begin{aligned}
\text{(Rs / Skr)bid} &= \text{(Rs / \$) bid} \times \text{(\$ / Skr) bid} \\
&= \text{(Rs / \$) bid} \times \frac{1}{\text{(Skr / \$)ask}} \\
&= 47.20 \times \frac{1}{7.9662} \\
&= 5.925 \\
\text{Less exchange margin} &= 0.005 \\
&\quad \text{5.92 per Skr}
\end{aligned}
$$

II. If the dealer covers the transaction, through Bahrain market:

Sell 1 million Swedish Kroner at the rate of 12.7539 and acquire pounds and sell the pounds in Mumbai at the buying rate of 75.95. The exchange margin of 0.005 paise is to be deducted

$$
\begin{aligned}
\text{(Rs / Skr) bid} &= \text{(Rs / £) bid} \times \text{(£ / Skr) bid} \\
&= \text{(Rs / £) bid} \times \frac{1}{\text{(Skr / £)ask}} \\
&= 75.95 \times \frac{1}{12.7539} \\
&= 5.955 \\
\text{Less exchange margin} &= 0.005 \\
&\quad \text{5.95 per Skr}
\end{aligned}
$$

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The dealer must cover the transaction through Bahrain market as the rate per Skr is Rs.5.955. The customer gains 5 paise per Skr if he chooses to rely on the rate given by his banker. The gain is 0.05 ´ 10,00,000 = Rs.50,000.

## Question 21.

Expected return from the scrip Morepen Lab Ltd. =

$R_f + \beta (Rm - Rf)$ = 0.065 + 1.65 (0.12 - 0.065) = 15.575%

Robinson buys Rs.1 million worth of shares of Morepen Lab Ltd. The value of his investment after one year = 1000 000 (1.15575) = 1155750

If the current spot rate of AUS $ / Re is 'x', after one year, it is expected to be AUS$ 0.97x / Re

Hence Australian $ return on Robinson's investment in Morepen Lab Ltd.

$$= \frac{[(1155750)(0.97x) - 1000000x]}{1000000x}$$

$$= 12.10775\ \%$$

Say 12.11%

Variance of his returns = $25 + 10 + 2 \times 0 \times \sqrt{25 \times 10} = 35$

Hence the expected return of Mr. Robinson is 12.11% with a risk of $35(\%)^2$.

## Question 22.

**Alternative I**

Investing in Euro (home currency)

Returns after 3 months = $2000000\left(1+\frac{0.032}{4}\right)$=2016000

Returns for 3 months = 2016000 - 2000 000 = Euro 16000

**Alternative II**

Investing in dollars

$ / Euro spot 1.1410/12

MNC buys dollars at 1.1410/ Euro

Inflow of dollars for Euro 2 mio = 2000 000 × 1.1410 = $2282000

Invest dollars at 2.6% for 3 months.

$$\text{Returns in dollars} = 2282000\left(1+\frac{0.026}{4}\right)$$

$$= \$2296833$$

$$\text{MNC will sell \$, to buy Euro at forward rate of \$1.1393/Euro} = \frac{2296833}{1.1393}$$

= Euro 2016003.69

say Euro 2016004

Returns for three months = 2016004 - 2000000 = Euro 16004

**Alternative III**

invest in pounds

$$\text{£ / Euro spot bid rate} = (\text{£}/\$)_{bid} \times (\$/\text{Euro})_{bid}$$

= 0.6217 × 1.1410

= £0.7094 / Euro

£ / Euro ask rate = 0.6219 × 1.1412 = £ 0.7097 /Euro

£ / Euro 3 months forward bid rate = 0.6230 × 1.1390 = £ 0.7096 / Euro

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£ / Euro 3 months forward ask rate = 0.6233 × 1.1393 = £ 0.7101 / Euro

MNC buys pounds at 0.7094 / Euro

Inflow of pounds for Euro 2 mio = 2000000 × 0.7094 = £ 1418800

Invest pounds at 3% for 3 months $1418800 \times \left(1+\frac{0.03}{4}\right)$

$= £\ 1429441$

After 3 months MNC will sell pounds to buy Euro at forward rate of £ 0.7101 / Euro

Inflow of Euro $= \frac{1429441}{0.7101}$

= Euro 2013013.66

Say Euro 2013014

Return for 3 months = 2013014 - 2000 000 = 13014

If MNC invests in dollars the inflow is more by just Euro 4 only.

Hence it is advisable to invest in home currency of Euro, to avoid transaction costs.

## Question 23.

**i. Rs./Euro bid rate**

Borrow Rs.42.42 for 1 month at 9% pa and buy 1 Euro

Repay with interest at 9% = $42.42\left(1+\frac{0.09}{12}\right)=42.74$

Invest 1 Euro for 1 month to get = $1\left(1+\frac{0.03}{12}\right)=1.0025$

To prevent covered interest arbitrage,

1.0025 × (Rs./Euro) bid ≤ 42.74

(Rs./Euro) bid ≤ 42.63

**Rs./Euro ask rate**

Borrow 1 Euro for 1 month at 3.36%pa and sell it to get Rs.42.38

$$\text{Repayment in Euro} = 1\left(1+\frac{0.0336}{12}\right) = 1.0028$$

$$\text{Invest Rs.42.38 at 8\%} = 42.38\left(1+\frac{0.08}{12}\right) = 42.66.$$

To prevent covered interest arbitrage,

1.0028 × (Rs./Euro) ask ≥ 42.66

(Rs./Euro) ask ≥ 42.54.

ii. The synthetic quotes to prevent 3 point arbitrage:

(Rs./Euro) bid = (Rs./$) bid × ($ / Euro) bid

$$= \text{(Rs./\$) bid} \times \frac{1}{\text{(Euro / \$) ask}} = 48.66 \times \frac{1}{1.1495} = 42.33.$$

$$\text{(Rs./Euro) ask} = \text{(Rs./\$) ask} \times \text{(\$/Euro) ask} = \text{(Rs./\$) ask} \times \frac{1}{\text{(Euro / \$) bid`}}$$

$$= 48.86 \times \frac{1}{1.1485} = 42.54.$$

Synthetic rate: Rs./Euro = 42.33/54

Since the actual (Rs./Euro) ask which is 42.28 is less than synthetic (Rs./Euro) bid rate of 42.33, there is scope for triangular currency arbitrage.

Buy 1 Euro for Rs.42.28

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Convert Euro to $ to get $\frac{1}{1.1495} = \$0.8699$

Sell $ to get $0.8699 \times 48.66 = Rs.42.33$

Thus by investing Rs.42.28

We are making a gain of Rs.0.05.

## Question 24.

The company requires Rs.50 million

Borrow in Dollars:

Amount of dollars required to be borrowed = $\frac{50}{48.50} = 1.030928$ million

Amount to be repaid after 6 months = $1.030928\left(1+\frac{0.04}{4}\right) = \$\ 1.041237$ million

If covered through forward market, rupee outflow = $1.041237 \times 49.05 = 51.0727$

$$\text{Annualized effective cost of borrowing} = \frac{51.0727-50}{50}\times\frac{12}{3} = 8.58\%$$

If kept open position, rupee outflow = $1.041237 \times 48.95 = 50.96855$.

$$\text{Annualized effective cost of borrowing} = \frac{50.96855-50}{50}\times\frac{12}{3} = 7.75\%.$$

Borrow in sterling:

$$\text{Amount of sterling required to be borrowed} = \frac{50}{74.05} = £\ 0.675219 \text{ million}$$

$$\text{Amount to be repaid after 3 months} = 0.675219\left(1+\frac{0.06}{4}\right) = £\ 0.685347 \text{ million}$$

If covered through forward market rupee outflow = $0.685347 \times 75 = 51.401025$

$$\text{Effective cost of borrowing} = \frac{51.401025-50}{50}\times\frac{12}{3} = 11.21\%$$

If kept open position, rupee outflow

$$= 0.685347 \times 74.80 = 51.263956.$$

$$\text{Effective cost of borrowing} = \frac{51.263956-50}{50}\times\frac{12}{3} = 10.11\%$$

So, it is better to borrow in dollars and keep open position.

## Question 25.

Investment in India

Size of the investment : £ 1 million

Investment in Rs. : $1 \times 69.50$ = Rs.69.50 million.

Return earned = $0.15 \times 69.50$ = Rs.10.425 million

Post tax return = Rs.10.425 × (1 – 0.15) = Rs.8.86125 million

Total amount to be repatriated = Rs.(69.50 + 8.86125) million = Rs.78.36125 million

If PPP holds good, exchange rate after 1 year is

$$\text{(Rs./£) bid} = 69.50 \times \frac{1.04}{1.02}$$

$$= 70.86$$

$$\text{(Rs./£) ask} = 69.70 \times \frac{1.04}{1.02}$$

$$= 71.07$$

Rs./£ after 1 year = 70.86/71.07

∴ FII can repatriate Rs.78.36125 million by buying pounds at Rs.71.07 per pound

$$= \frac{78.36125}{71.07}$$

$$= £\ 1.1026 \text{ million}$$

$$\therefore \text{Return in £} = \frac{1.1026 - 1.00}{1.00} = 10.26\%$$

**Investment in Hong Kong**

Investment in HK $ = 1 × 11.15 = HK $ 11.15 million

Return earned = 0.12 × 11.15 = HK $ 1.338 million

Post tax return = 1.338 × 0.88 = HK $1.1774

HK $ to be repatriated = 11.15 + 1.1774 = HK $12.3274

Expected (HK $/£) bid after 1 year

$$= 11.15 \times \frac{1.03}{1.02} = 11.26$$

$$(\text{HK \$ / £}) \text{ ask} = 11.18 \times \frac{1.03}{1.02}$$

$$= 11.29.$$

FII can repatriate in pounds at the rate of HK $ 11.29/£

$$= \frac{12.3274}{11.29}$$

$$= £1.09189$$

$$\therefore \text{Return in £} = \frac{1.09189 - 1}{1} = 9.19\%$$

As the expected return earned in India is higher, the FII should invest in India.