

**CA FINAL**

**STRATEGIC FINANCIAL MANAGEMENT**

**REVISION CLASS**

REVISION

# STRATEGIC FINANCIAL MANAGEMENT

FOREX

## QUESTION 1

### EARLY DELIVERY

On 1st January 2019 Global Ltd., an exporter entered into a forward contract with BBC Bank to sell US\$ 2,00,000 on 31st March 2019 at ₹ 71.50/\$. However, due to the request of the importer, Global Ltd. received the amount on 28 February 2019. Global Ltd. requested the Bank to take delivery of the remittance on 2nd March 2019. The Inter-banking rates on 28th February were as follows:

Spot Rate	₹ 71.20/71.25
One month premium	5/10

If Bank agrees to take early delivery then what will be the net inflow to Global Ltd. assuming that the prevailing prime lending rate is 15%. Assume 365 days in a year.

## ANSWER

On 28th February 2019 bank would purchase from the exporter US\$ 200000 at the agreed rate i.e. ₹ 71.50/\$. However, bank will charge for this early delivery consisting of Swap Difference and Interest on outlay of funds.

**i. Swap Difference**

Bank sells at	₹ 71.20
It buys at	₹ 71.35
Swap loss per US\$	₹ 0.15

Swap loss for \$ 200000 is ₹ 30,000

**ii. Interest on Outlay of funds**

On February Bank sell \$ in Market	₹ 71.20
Bank buys from customer	₹ 71.50
Outlay per US \$	₹ 0.30
Outlay of funds for US\$ 200000	₹ 60,000

Interest of outlay of funds on ₹ 60,000 for 31 days (1st March 2019 to 31st March 2019) at 15% p.a. i.e. ₹ 764

**iii. Charges for early delivery**

Swap Loss	₹ 30,000
Interest on Outlay of Funds	₹ 764
	₹ 30,764

**iv. Net Inflow to Global Ltd.**

Proceed of US \$ 200000@₹ 71.50	₹ 1,43,00,000
Less: Charges for early delivery	₹ 30,764
Net Inflow	₹ 1,42,69,236

**QUESTION 2**

On 19th January, Bank A entered into forward contract with a customer for a forward sale of US \$ 7,000, delivery 20th March at ₹ 46.67. On the same day, it covered its position by buying forward from the market due 19th March, at the rate of ₹ 46.655. On 19th February, the customer approaches the bank and requests for early delivery of US \$. Rates prevailing in the interbank markets on that date are as under:

Spot (₹/\$)            46.5725/5800

March                    46.3550/3650

Interest on outflow of funds is 16% and on inflow of funds is 12%. Flat charges for early delivery are ₹ 100.

What is the amount that would be recovered from the customer on the transaction?

Note: Calculation should be made on months basis than on days basis.

## ANSWER

The bank would sell US \$ to its customer at the agreed rate under the contract. However, it would recover loss from the customer for early delivery.

On 19th February bank would buy US\$ 7000 from market and shall sell to customer. Further, Bank would enter into one month forward contract to sell the US \$ acquired under the cover deal.

### i. Swap Difference

Bank sells at	₹ 46.3550
Bank buys at	₹ 46.5800
Swap loss per US \$	0.225
Swap loss for US \$ 7000	₹ 1,575

### ii. Interest on Outlay of Funds

On 19th February, Bank sell to customer	₹ 46.67
It buys from spot Market	₹ 46.58
Inflow of funds per US \$	₹ 0.09

Inflow of funds for US \$ 7000 is ₹ 630

Interest on ₹ 630 at 12% for one month ₹ 6.30

### iii. Charges for early delivery

Swap loss	₹ 1,575.00
Flat charges	₹ 100.00
Less: Interest on outflow of funds	₹ 6.30
	<u>₹ 1,668.70</u>

### Total amount to be recovered from the customer

Amount as per Forward Contract ₹ 46.67 x 7000	₹ 3,26,690.00
Add: Charges for early delivery	<u>₹ 1,668.70</u>
	<u>₹ 3,28,358.70</u>

### QUESTION 3

## EXTRA COMMERCIAL BORROWING

K Ltd. currently operates from 4 different buildings and wants to consolidate its operations into one building which is expected to cost ₹ 90 crores. The Board of K Ltd. had approved the above plan and to fund the above cost, agreed to avail an External Commercial Borrowing (ECB) of GBP 10 m from G Bank Ltd. on the following conditions:

- The Loan will be availed on 1st April, 2019 with interest payable on half yearly rest.
- Average Loan Maturity life will be 3.4 years with an overall tenure of 5 years.
- Upfront Fee of 1.20%.
- Interest Cost is GBP 6 months LIBOR + Margin of 2.50%.
- The 6 month LIBOR is expected to be 1.05%.

K Ltd. also entered into a GBP-INR hedge at 1 GBP = INR 90 to cover the exposure on account of the above ECB Loan and the cost of the hedge is coming to 4.00% p.a.

As a Finance Manager, given the above information and taking the 1 GBP = INR 90:

- i. Calculate the overall cost both in percentage and rupee terms on an annual basis.
- ii. What is the cost of hedging in rupee terms?
- iii. If K Ltd. wants to pursue an aggressive approach, what would be the net gain/loss for K Ltd. if the INR depreciates/appreciates against GBP by 10% at the end of the 5 years assuming that the loan is repaid in GBP at the end of 5 years?

Ignore time value and taxes and calculate to two decimals.

## ANSWER

### i. Calculation of Overall Cost

Upfront Fee (GBP 10 M @ 1.20%)	₹ 1,20,000
Interest Payment (GBP 10 M x 3.55% x 3.4)	₹ 12,07,000
Hedging Cost (GBP 10 M x 4% x 3.4)	₹ 13,60,000
<b>Total</b>	<b>₹ 26,87,000</b>
<b>Or ₹ 2.687 million</b>	

Overall cost in % terms on Annual Basis

$$= \frac{2.687 \text{ million}}{(1,00,00,000 - 1,20,000)} \times \frac{1}{3.4} = \frac{2.687}{9.88} \times \frac{1}{3.4} \times 100 = 8\%$$

Overall Cost in Rupee terms@ GBP 1

$$= ₹ 90 \times \frac{2.687}{3.4} \times 100 = ₹ 711.26 \text{ lakhs}$$

**OR**

$$\begin{aligned} \text{Overall cost in \% terms on Annual Basis} &= \frac{2.687 \text{ million}}{(1,00,00,000)} \times \frac{1}{3.4} \\ &= \frac{2.687}{1.00} \times \frac{1}{3.4} \times 100 = 7.9\% \end{aligned}$$

$$\begin{aligned} \text{Overall Cost in Rupee terms@ GBP 1} &= 10,000,000 \times 7.90\% \times 90 \\ &= ₹ 71,100,000 \end{aligned}$$

**OR**

### Calculation of overall cost

Interest & Margin (A)	3.55%
Hedging cost (B)	4%
	<b>7.55%</b>
Onetime fee	1.20%
Average loan maturity	3.4 years
Per annum cost 1.2/3.4 (C)	0.35%
<b>Annual overall cost in % terms (A+B+C)</b>	<b>= 7.9%</b>

$$\text{Overall Cost in Rupee terms@ GBP 1} = 10,000,000 \times 7.90\% \times 90 = ₹ 71,100,000$$

**ii. Cost of Hedging in terms of Rupees**

$$₹ 13,60,000 \times 90 = ₹ 12,24,00,000 = ₹ 12.24 \text{ crores in Total}$$

OR

$$GBP10,000,000 \times 90 \times 4\% = ₹ 3,60,00,000 \text{ on Annual Basis}$$
**iii. If K Ltd. pursues an aggressive approach then Gain/Loss in INR Depreciation/ Appreciation shall be computed as follows:**
**a. If INR depreciates by 10%**

Re. loss per GBP = 90 x 10%	₹ 9
Total Losses GBP10M	₹ 90 Million
Less: Cost of Hedging	₹ 36 Million
Net Loss	₹ 54 million

**b. If INR appreciates by 10%**

₹ Gains per GBP = ₹ 90 x 10%	= ₹ 9
Total Gain on Repayment of loan	= 90 Million
Add: Saving in Cost of Hedging	= <u>36 Million</u>
Net Gain	= <u>126 Million</u>

**QUESTION 4****NOSTRO ACCOUNT**

A dealer in foreign exchange has the following position in Swiss Francs on 31 st January, 2018:

	<b>(Swiss Francs)</b>
Balance in the Nostro A/c Credit	1,00,000
Opening Position Overbought	50,000
Purchased a bill on Zurich	70,000
Sold forward TT	49,000
Forward purchase contract cancelled	41,000
Remitted by TT	75,000
Draft on Zurich cancelled	40,000

Examine what steps would the dealer take, if he is required to maintain a credit balance of Swiss Francs 30,000 in the Nostro A/c and keep as overbought position on Swiss Francs 10,000?

**ANSWER**

**Exchange Position:**

Particulars	Purchase Sw. Fcs.	Sale Sw. Fcs.
Opening Balance Overbought	50,000	
Bill on Zurich	70,000	
Forward Sales – TT		49,000
Cancellation of Forward Contract		41,000
TT Sales		75,000
Draft on Zurich cancelled	40,000	—
	<b>1,60,000</b>	<b>1,65,000</b>
Closing Balance Oversold	5,000	—
	<b>1,65,000</b>	<b>1,65,000</b>

**Cash Position (Nostro A/c)**

	Credit	Debit
Opening balance credit	1,00,000	—
TT sales	—	75,000
	1,00,000	75,000
Closing balance (credit)	—	25,000
	1,00,000	1,00,000

The Bank has to buy spot TT Sw. Fcs. 5,000 to increase the balance in Nostro account to Sw. Fcs. 30,000.

This would bring down the oversold position on Sw. Fcs. as Nil.

Since the bank requires an overbought position of Sw. Fcs. 10,000, it has to buy forward Sw. Fcs. 10,000.

**QUESTION 5****ADR/GDR**

Omega Ltd. is interested in expanding its operation and planning to install manufacturing plant at US. For the proposed project, it requires a fund of \$10 million (net of issue expenses or floatation cost). The estimated floatation cost is 2%. To finance this project, it proposes to issue GDRs.

As a financial consultant, you are requested to compute the number of GDRs to be issued and cost of the GDR with the help of following additional information:

- i. Expected market price of share at the time of issue of GDR is ₹ 250 (Face Value being ₹ 100)
- ii. 2 shares shall underlay each GDR and shall be priced at 4% discount to market price.
- iii. Expected exchange rate ₹ 64/\$
- iv. Dividend expected to be paid is 15% with growth rate 12%.

**ANSWER**

Net Issue Size = \$10 million

$$\text{Gross Issue} = \frac{\text{₹ } 10 \text{ million}}{0.98} = \$10.2041 \text{ million}$$

$$\text{Issue Price per GDR in ₹ (250 x 2 x 96\%)} = \text{₹ } 480$$

$$\text{Issue Price per GDR in \$ (₹ } 480 / \text{₹ } 64) = \$7.50$$

$$\text{Dividend Per GDR (D1) = ₹ } 15 \times 2 = \text{₹ } 30$$

$$\text{Net Proceeds Per GDR = ₹ } 480 \times 0.98 = \text{₹ } 470.40$$

**i. Number of GDR to be issued**

$$\frac{\$10.2041 \text{ million}}{\$7.50} = 1.360547 \text{ million}$$

**ii. Cost of GDR to Omega Ltd.**

$$K_e = \frac{30}{470.40} + 0.12 = 18.378\%$$

**QUESTION 6**
**INTERNATIONAL PROJECT**

XYZ Ltd., a company based in India, manufactures very high quality modern furniture and sells to a small number of retail outlets in India and Nepal. It is facing tough competition. Recent studies on marketability of products have clearly indicated that the customer is now more interested in variety and choice rather than exclusivity and exceptional quality. Since the cost of quality wood in India is very high, the company is reviewing the proposal for import of woods in bulk from Nepalese supplier.

The estimate of net Indian (₹) and Nepalese Currency (NC) cash flows in Nominal terms for this proposal is shown below:

	Net Cash Flow (in millions)			
Year	0	1	2	3
NC	-25.000	2.600	3.800	4.100
Indian (₹)	0	2.869	4.200	4.600

The following information is relevant:

- i. XYZ Ltd. evaluates all investments by using a discount rate of 9% p.a. All Nepalese customers are invoiced in NC. NC cash flows are converted to Indian (₹) at the forward rate and discounted at the Indian rate.
- ii. Inflation rates in Nepal and India are expected to be 9% and 8% p.a. respectively. The current exchange rate is ₹ 1 = NC 1.6

Assuming that you are the finance manager of XYZ Ltd., calculate the net present value (NPV) and modified internal rate of return (MIRR) of the proposal.

You may use following values with respect to discount factor for ₹ 1 @9%.

	Present Value	Future Value
Year 1	0.917	1.188
Year 2	0.842	1.090
Year 3	0.772	1

**ANSWER**

**Working Notes:**

**i. Computation of Forward Rates**

End of Year	NC	NC/₹
1	$NC1.60 \times \left( \frac{(1 + 0.09)}{(1 + 0.08)} \right)$	1.615
2	$NC1.615 \times \left( \frac{(1 + 0.09)}{(1 + 0.08)} \right)$	1.630
3	$NC1.630 \times \left( \frac{(1 + 0.09)}{(1 + 0.08)} \right)$	1.645

**ii. NC Cash Flows converted in Indian Rupees**

Year	NC (Million)	Conversion Rate	₹ (Million)
0	-25.00	1.600	-15.625
1	2.60	1.615	1.61
2	3.80	1.630	2.33
3	4.10	1.645	2.49

**Net Present Value**

(₹ Million)

Year	Cash Flow in India	Cash Flow in Nepal	Total	PVF @ 9%	PV
0	---	-15.625	-15.625	1.000	-15.625
1	2.869	1.61	4.479	0.917	4.107
2	4.200	2.33	6.53	0.842	5.498
3	4.600	2.49	7.09	0.772	5.473
					<b>-0.547</b>

**Modified Internal Rate of Return**

	Year			
	0	1	2	3
Cash Flow (₹ Million)	-15.625	4.479	6.53	7.09
Year 1 Cash Inflow reinvested for 2 years (1.188 x 4.479)				5.32
Year 2 Cash Inflow reinvested for 1 years (1.090 x 6.53)				7.12
				<b>19.53</b>

$$\text{MIRR} = \sqrt[n]{\frac{\text{Terminal Cash Flow}}{\text{Initial Outlay}}} - 1 = \sqrt[3]{\frac{19.53}{15.625}} - 1 = 0.0772 \text{ say } 7.72\%$$

**QUESTION 7****CURRENCY OF INVESTMENT**

KGF Bank's Sydney branch has surplus funds of USD \$ 7,00,000 for a period of 2 months. Cost of funds to the bank is 6% p.a. They propose to invest these funds in Sydney, New York or Tokyo and obtain the best yield, without any exchange risk to the bank. The following rates of interest are available at the three centres for investment of domestic funds there for a period of 2 Months.

Sydney                    7.5% p.a.

New York                8% p.a.

Tokyo                    4% p.a.

The market rates in Australia for US Dollars and Yen are as under:

**Sydney on New York:**

Spot                    0.7100/0.7300

1 Months              10/20

2 Months              25/30

**Sydney on Tokyo:**

Spot                    79.0900/79.2000

1 Months              40/30

2 Months              55/50

At which centre, will the investment be made & what will be the net gain to the bank on the invested funds?



**QUESTION 8**
**AUTOMATIC CALCULATION**

Y has to remit USD \$1,00,000 for his son's education on 4<sup>th</sup> April 2018. Accordingly, he has booked a forward contract with his bank on 4<sup>th</sup> January @ 63.8775. The Bank has covered its position in the market @ ₹ 63.7575.

The exchange rates for USD \$ in the interbank market on 4<sup>th</sup> April and 14<sup>th</sup> April were:

	4 <sup>th</sup> April ₹	14 <sup>th</sup> April ₹
Spot USD 1=	63.2775/63.2975	63.1575/63.1975
Spot/April	63.3975/63.4275	63.2775/63.3275
May	63.5275/63.5675	63.4075/63.7650
June	63.7775/63.8250	63.6575/63.7275
July	64.0700/64.1325	63.9575/64.0675

Exchange margin of 0.10 percent and interest outlay of funds @ 12 percent are applicable. The remitter, due to rescheduling of the semester, has requested on 14<sup>th</sup> April 2018 for extension of contract with due date on 14<sup>th</sup> June 2018.

Rates must be rounded to 4 decimal place in multiples of 0.0025.

**Calculate:**

- i. Cancellation Rate;
- ii. Amount Payable on \$ 100,000;
- iii. Swap loss;
- iv. Interest on outlay of funds, if any;
- v. New Contract Rate; and
- vi. Total Cost

## ANSWER

### i. Cancellation Rate:

The forward sale contract shall be cancelled at Spot TT Purchase for \$ prevailing on the date of cancellation as follows:

\$/₹ Market Buying Rate	₹ 63.1575
Less: Exchange Margin @ 0.10%	₹ 0.0632
	<b>₹ 63.0943</b>

Rounded off to ₹ 63.0950

### ii. Amount payable on \$ 1,00,000

Bank sells \$1,00,000 @ ₹ 63.8775	₹ 63,87,750
Bank buys \$1,00,000 @ ₹ 63.0950	₹ 63,09,500
Amount payable by customer	<b>₹ 78,250</b>

### iii. Swap Loss

On 4<sup>th</sup> April, the bank does a swap sale of \$ at market buying rate of ₹ 63.2775 and forward purchase for April at market selling rate of ₹ 63.4275.

Bank buys at	₹ 63.4275
Bank sells at	₹ 63.2775
Amount payable by customer	<b>₹ 0.1500</b>

Swap Loss for \$ 1,00,000 in ₹ = ₹ 15,000

### iv. Interest on Outlay of Funds

On 4<sup>th</sup> April, the bank receives delivery under cover contract at ₹ 63.7575 and sell spot at ₹ 63.2775.

Bank buys at	₹ 63.7575
Bank sells at	₹ 63.2775
Amount payable by customer	<b>₹ 0.4800</b>

Outlay for \$ 1,00,000 in ₹ 48,000

Interest on ₹ 48,000 @ 12% for 10 days ₹ 158

**v. New Contract Rate**

The contract will be extended at current rate

\$/₹ Market forward selling Rate for June	₹ 63.7275
Add: Exchange Margin @ 0.10%	₹ 0.0637
	<b>₹ 63.7912</b>

Rounded off to ₹ 63.7900

**vi. Total Cost**

Cancellation Charges	₹ 78,250.00
Swap Loss	₹ 15,000.00
Interest	₹ 158.00
	<b>₹ 93,408.00</b>

**QUESTION 9****CURRENCY OF BORROWING (IRP)**

A German subsidiary of an US based MNC has to mobilize 100000 Euro's working capital for the next 12 months. It has the following options:

Loan from German Bank	:	@ 5% p.a.
Loan from US Parent Bank	:	@ 4% p.a.
Loan from Swiss Bank	:	@ 3% p.a.

Banks in Germany charge an additional 0.25% p.a. towards loan servicing. Loans from outside Germany attract withholding tax of 8% on interest payments. If the interest rates given above are market determined, examine which loan is the most attractive using interest rate differential.

## ANSWER

**Net Cost under each of the Options is as follows:**

- i. Loan from German Bank  
 Cost = 5% + 0.25% = 5.25%

- ii. **Loan from US Parent Bank**

Effective Rate of Interest $\left( \frac{4\%}{1 - 0.08} \right)$	4.35%
Premium on US\$ $\left( \frac{1.05}{1.04} - 1 \right)$	0.96%
Net Cost	5.31%

- iii. **Loan from Swiss Bank**

Effective Rate of Interest $\left( \frac{3\%}{1 - 0.08} \right)$	3.26%
Premium on US\$ $\left( \frac{1.05}{1.03} - 1 \right)$	1.94%
Net Cost	5.20%

Thus, loan from Swiss Bank is the best option as the Total Outflow including Interest is Less i.e. €105200

**QUESTION 10****FOREIGN EXCHANGE EXPOSURE AND RISK**

H Ltd. is an Indian firm exporting handicrafts to North America. All the exports are invoiced in US\$. The firm is considering the use of money market or forward market to cover the receivable of \$50,000 expected to be realized in 3 months time and has the following information from its banker:

**Exchange Rates**

Spot	₹/\$ 72.65/73
3-m forward	₹/\$ 72.95/73.40

The borrowing rates in US and India are 6 % and 12% p.a. and the deposit rates are 4% and 9% p.a. respectively.

- i. Which option is better for H Ltd. ?
- ii. Assume that H Ltd. anticipates the spot exchange rate in 3-months time to be equal to the current 3-months forward rate. After 3-months the spot exchange rate turned out to be ₹/\$: 73/73.42. What is the foreign exchange exposure and risk of H Ltd.?

**ANSWER**

**i. Money market hedge**

For money market hedge Indian Firm shall borrow in US\$ and then translate them to Indian Rupee and shall make deposit in Indian Rupee.

For receipt of US\$ 50,000 in 3 months (@ 1.5% interest) amount required to be borrowed now  $(US\$ 50,000 \div 1.015) = US\$ 49,261.08$

With spot rate of 72.65 the Rupee deposit will be = ₹ 35,78,817.46

Deposit amount will increase over 3 months (@2.25% interest) will be = ₹ 36,59,340.85

**Forward market hedge**

Sell 3 months' forward contract accordingly, amount receivable after 3 months will be  $(US\$ 50,000 \times 72.95) = ₹ 36,47,500$

In this case, more will be received under the money market hedge hence it is better option.

**ii. Exchange Exposure to H Ltd.**

Expected Realisation as per Forward Rate  $(US\$ 50,000 \times 72.95)$  ₹ 36,47,500

Actual Realisation as per actual Spot Rate  $(US\$ 50,000 \times 73.00)$  ₹ 36,50,000

Gain ₹ 2,500

## REVISION

# STRATEGIC FINANCIAL MANAGEMENT

## EQUITY VALUATION

### QUESTION 11

#### TECHNICAL ANALYSIS EMA

AB Ltd.'s equity shares are presently selling at a price of ₹ 500 each. An investor is interested in purchasing AB Ltd.'s shares. The investor expects that there is a 70% chance that the price will go up to ₹ 650 or a 30% chance that it will go down to ₹ 450, three months from now. There is a call option on the shares of the firm that can be exercised only at the end of three months at an exercise price of ₹ 550.

Calculate the following:

- i. If the investor wants a perfect hedge, what combination of the share and option should he select ?
- ii. Explain how the investor will be able to maintain identical position regardless of the share price.
- iii. If the risk-free rate of return is 5% for the three months period, what is the value of the option at the beginning of the period ?
- iv. What is the expected return on the option?

## Answer

i. To compute perfect hedge we shall compute Hedge Ratio ( $\Delta$ ) as follows:

$$\Delta = \frac{C_1 - C_2}{S_1 - S_2} = \frac{100 - 0}{650 - 450} = \frac{100}{200} = 0.50$$

The investor should purchase 0.50 share for every 1 call option

Or, the investor should purchase 1 share for every 2 Call Option.

ii. How the investor will be able to maintain his position if he purchase 0.50 share for 1 call option written.

a. If price of share goes upto ₹ 650 then value of purchased share will be:

Sale Proceeds of Investment (0.50 x ₹ 650) ₹ 325

Loss on account of Short Position (₹ 650 – ₹ 550) ₹ 100

₹ 225

b. If price of share comes down to ₹ 450 then value of purchased share will be:

Sale Proceeds of Investment (0.50 x ₹ 450) ₹ 225

iii. The Value of Option, say, P at the beginning of the period shall be computed as follows:

$$(\text{₹ } 250 - P) 1.05 = \text{₹ } 225$$

$$\text{₹ } 262.50 - 1.05P = \text{₹ } 225$$

$$\text{₹ } 37.5 = 1.05P$$

$$P = \text{₹ } 35.71$$

iv. Expected Return on the Option

$$\text{Expected Option Value} = (\text{₹ } 650 - \text{₹ } 550) \times 0.70 + \text{₹ } 0 \times 0.30 = \text{₹ } 70$$

$$\text{Expected Rate of Return} = \frac{70 - 35.71}{35.71} \times 100 = 96.02\%$$

**QUESTION 12**
**AMBIGUOUS SUM ON EVA**

Compute Economic Value Added (EVA) of Good luck Ltd. from the following information:

**Profit & Loss Statement**

<b>a. Income -</b>	
Revenue from Operations	2000
<b>b. Expenses -</b>	
Direct Expenses	800
Indirect Expenses	400
<b>c. Profit before interest &amp; tax(a-b)</b>	<b>800</b>
<b>d. Interest</b>	<b>30</b>
<b>e. Profit before tax (c - d)</b>	<b>770</b>
<b>f. Tax</b>	<b>231</b>
<b>g. Profit after tax (e - f)</b>	<b>539</b>

**Balance Sheet**

Particulars	(₹ in Lakh)
<b>Equity and Liabilities :</b>	
<b>a. Shareholder's Fund -</b>	
Equity Share Capital	1000
Reserve and Surplus	600
<b>b. Non- Current Liabilities -</b>	
Long Term Borrowings	200
<b>c. Current Liabilities</b>	<b>800</b>
	<b>2600</b>
<b>Assets :</b>	
<b>a. Non - Current Assets</b>	<b>2000</b>
<b>b. Current Assets</b>	<b>600</b>
<b>Total</b>	<b>2600</b>

Other Information:

1. Cost of Debts is 15%.
2. Cost of Equity (i.e. shareholders' expected return) is 12%.
3. Tax Rate is 30%.
4. Bad Debts Provision of ₹ 40 lakhs is included in indirect expenses and ₹ 40 lakhs reduced from receivables in current assets.

## Answer

$$\begin{aligned} \text{EVA} &= \text{NOPAT} - (\text{Invested Capital} \times \text{WACC}) \\ \text{NOPAT} &= \text{EBIT} - \text{Tax} + \text{Non-Cash Expenses} \\ &= 800 \text{ lakhs} - 231 \text{ lakhs} + 40 \text{ lakhs} = ₹ 609 \text{ lakh} \end{aligned}$$

**(OR)**

$$\begin{aligned} \text{Operating Income} &= \text{Taxable Income} + \text{Interest} + \text{Non-cash Expenses} \\ &= 539 + 30 + 40 = ₹ 609 \text{ lakh} \end{aligned}$$

$$\begin{aligned} \text{Invested Capital} &= 1000 + 600 + 200 = 1800 \\ &= 1800 + 40 \text{ (Non-cash expenses)} = ₹ 1840 \text{ lakhs} \end{aligned}$$

$$\text{WACC} = \frac{1600}{1800} \times 12\% + \frac{200}{1800} \times 15\% (1-0.3)$$

$$= 10.67\% + 1.17\% = 11.84\%$$

$$\begin{aligned} \text{Now, EVA} &= 609 - (1840 \times 11.84\%) \\ &= 609 - 217.86 = ₹ 391.14 \text{ lakhs} \end{aligned}$$

OR

$$\text{WACC} = \frac{1000}{1200} \times 12\% + \frac{200}{1200} \times 15\% (1-0.3)$$

$$= 10.00\% + 1.75\% = 11.75\%$$

$$\text{Now, EVA} = 609 - (1840 \times 11.75\%) = 609 - 216.20 = ₹ 392.80 \text{ lakhs}$$

**QUESTION 13**
**ALCAR MODEL**

Following details are available for X Ltd.

Income Statement for the year ended 31st March, 2018

Particulars	Amount
Sales	40,000
Gross Profit	12,000
Administrative Expenses	6,000
Profit Before tax	6,000
Tax @ 30%	1,800
Profit After Tax	4,200

Balance sheet as on 31st March, 2018

Particulars	Amount
Fixed Assets	10,000
Current Assets	6,000
Total Assets	16,000
Equity Share Capital	15,000
Sundry Creditors	1,000
Total Liabilities	16,000

The Company is contemplating for new sales strategy as follows :

- i. Sales to grow at 30% per year for next four years.
- ii. Assets turnover ratio, net profit ratio and tax rate will remain the same.
- iii. Depreciation will be 15% of value of net fixed assets at the beginning of the year.
- iv. Required rate of return for the company is 15%

Evaluate the viability of new strategy.

## Answer

### Projected Balance Sheet

	Year 1	Year 2	Year 3	Year 4	Year 5
Fixed Assets (25% of Sales)	13,000	16,900	21,970	28,561.00	28,561.00
Current Assets (15% of Sales)	7,800	10,140	13,182	17,136.60	17,136.60
<b>Total Assets</b>	<b>20,800</b>	<b>27,040</b>	<b>35,152</b>	<b>45,697.60</b>	<b>45,697.60</b>
Equity (37.5% of sales)	19,500	25,350	32,955	42,841.50	42,841.50
Sundry Creditors (2.5% of Sales)	1,300	1,690	2,197	2,856.10	2,856.10
<b>Total Liabilities</b>	<b>20,800</b>	<b>27,040</b>	<b>35,152</b>	<b>45,697.60</b>	<b>45,697.60</b>

### Projected Cash Flows

	Year 1	Year 2	Year 3	Year 4	Year 5
Sales	52,000	67,600	87,880.00	1,14,244.00	1,14,244.00
PBT (15% of sales)	7,800	10,140	13,182.00	17,136.60	17,136.60
PAT (10.5% of sales)	5,460	7,098	9,227.40	11,995.62	11,995.62
Depreciation	1,500	1,950	2,535.00	3,295.50	4,284.15
Addition to Fixed Assets	4,500	5,850	7,605.00	9,886.50	4,284.15
Increase in Net Current Assets	1,500	1,950	2,535.00	3,295.50	-
Operating cash flow	960	1,248	1,622.40	2,109.12	11,995.62

### Projected Cash Flows

Present value of Projected Cash Flows

Cash Flows	PVF at 15%	PV
960	0.870	835.20
1248	0.756	943.49
1622.40	0.658	1067.54
2109.12	0.572	1206.42
		<b>4,052.65</b>

$$\begin{aligned}
 \text{Residual Value} &= 11,995.62 / 0.15 = 79,970.80 \\
 \text{Present value of Residual value} &= 79,970.80 \times \text{PVF} (15\%, 4) \\
 &= 79,970.80 \times 0.572 = 45,743.30 \\
 \text{Total shareholders' value} &= 45,743.30 + 4,052.65 = 49,795.95 \\
 \text{Pre-strategy value} &= 4,200 / 0.15 = 28,000 \\
 \therefore \text{Value of strategy} &= 49,795.95 - 28,000 = 21,795.95
 \end{aligned}$$

**Conclusion: The strategy is financially viable.**

## QUESTION 14

ABC Co. is considering a new sales strategy that will be valid for the next 4 years. They want to know the value of the new strategy. Following information relating to the year which has just ended, is available:

<b>Income Statement</b>	<b>₹</b>
Sales	20,000
Gross margin (20%)	4,000
Administration, Selling & distribution expense (10%)	2,000
PBT	2,000
Tax (30%)	600
PAT	1,400
<b>Balance Sheet Information</b>	
Fixed Assets	8,000
Current Assets	4,000
Equity	12,000

If it adopts the new strategy, sales will grow at the rate of 20% per year for three years. The gross margin ratio, Assets turnover ratio, the Capital structure and the income tax rate will remain unchanged.

Depreciation would be at 10% of net fixed assets at the beginning of the year.

The Company's target rate of return is 15%.

Determine the incremental value due to adoption of the strategy.

## Answer

### Projected Balance Sheet

	Year 1	Year 2	Year 3	Year 4
Fixed Assets (40% of Sales)	9,600	11,520	13,824	13,824
Current Assets (20% of Sales)	4,800	5,760	6,912	6,912
Total Assets	14,400	17,280	20,736	20,736
Equity	14,400	17,280	20,736	20,736

### Projected Cash Flows

	Year 1	Year 2	Year 3	Year 4
Sales	24,000	28,800	34,560	34,560
PBT (10% of sale)	2,400	2,880	3,456	3,456
PAT (70%)	1,680	2,016	2,419.20	2,419.20
Depreciation	800	960	1,152	1,382
Addition to Fixed Assets	2,400	2,880	3,456	1,382
Increase in Current Assets	800	960	1,152	-
Operating cash flow (FCFF)	(720)	(864)	(1,036.80)	2,419.20

### Projected Cash Flows

Present value of Projected Cash Flows

Cash Flows	PVF at 15%	PV
-720	0.870	-626.40
-864	0.756	-653.18
-1,036.80	0.658	-682.21
		<b>-1,961.79</b>

Residual Value -	$2419.20/0.15$	$= 16,128$
Present value of Residual value	$16128/(1.15)^3$	$= 10603.55$
Total shareholders' value	$= 10,603.55 - 1,961.79$	$= 8,641.76$
Pre strategy value	$= 1,400 / 0.15$	$= 9,333.33$
∴ Value of strategy	$= 8,641.76 - 9,333.33$	$= - 691.57$

**Conclusion: The strategy is not financially viable**

**QUESTION 15****DDM AND BONUS ISSUE**

Mr. A is thinking of buying shares at ₹ 500 each having face value of ₹ 100. He is expecting a bonus at the ratio of 1:5 during the fourth year. Annual expected dividend is 20% and the same rate is expected to be maintained on the expanded capital base. He intends to sell the shares at the end of seventh year at an expected price of ₹ 900 each. Incidental expenses for purchase and sale of shares are estimated to be 5% of the market price. He expects a minimum return of 12% per annum.

Should Mr. A buy the share? If so, what maximum price should he pay for each share? Assume no tax on dividend income and capital gain.

## Answer

### P.V. of dividend stream and sales proceeds

Year	Divd. /Sale	PVF (12%)	PV (₹)
1	₹ 20/-	0.893	17.86
2	₹ 20/-	0.797	15.94
3	₹ 20/-	0.712	14.24
4	₹ 24/-	0.636	15.26
5	₹ 24/-	0.567	13.61
6	₹ 24/-	0.507	12.17
7	₹ 24/-	0.452	10.85
7	₹ 1026/- (₹ 900 x 1.2 x 0.95)	0.452	463.75
			<b>₹ 563.68</b>
Less : - Cost of Share (₹ 500 x 1.05)			<b>₹ 525.00</b>
Net gain			<b>₹ 38.68</b>

Since Mr. A is gaining ₹ 38.68 per share, he should buy the share.

Maximum price Mr. A should be ready to pay is ₹ 563.68 which will include incidental expenses. So the maximum price should be ₹ 563.68 x 100/105 = ₹ 536.84

**QUESTION 16**
**RELATIVE VALUATION**

XY Ltd., a Cement manufacturing Company has hired you as a financial consultant of the company. The Cement Industry has been very stable for some time and the cement companies SK Ltd. & AS Ltd. are similar in size and have similar product market mix characteristic. Use comparable method to value the equity of XY Ltd. In performing analysis, use the following ratios:

- i. Market to book value
- ii. Market to replacement cost
- iii. Market to sales
- iv. Market to Net Income

The following data are available for your analysis:

(Amount in ₹)

	SK Ltd.	AS Ltd.	XY Ltd.
Market Value	450	400	
Book Value	400	300	250
Replacement Cost	600	550	500
Sales	550	450	500
Net Income	18	16	14

## Answer

### Estimation of Ratios

Sl. No.	Particulars	SK Ltd.	AS Ltd.	Average
(i)	Market to Book Value	$\left(\frac{450}{400}\right) = 1.125$	$\left(\frac{400}{300}\right) = 1.333$	1.2290
(ii)	Market to Replacement Cost	$\left(\frac{450}{600}\right) = 0.750$	$\left(\frac{400}{550}\right) = 0.727$	0.7385
(iii)	Market to Sales	$\left(\frac{450}{550}\right) = 0.818$	$\left(\frac{400}{450}\right) = 0.889$	0.8535
(iv)	Market to Net Income	$\left(\frac{450}{18}\right) = 25$	$\left(\frac{400}{16}\right) = 25$	25

### Application of Ratios to XY Ltd.

Sl. No.	Particulars	XY Ltd. (₹)	Average	Indicative Value of XY Ltd. (₹)
(i)	Book Value	250	1.2290	$250 \times 1.2290 = 307.25$
(ii)	Replacement Cost	500	0.7385	$500 \times 0.7385 = 369.25$
(iii)	Sales	500	0.8535	$500 \times 0.8535 = 426.75$
(iv)	Net Income	14	25	$14 \times 25 = 350.00$
Average				₹ 363.31

**Value of XY Ltd. according to the comparable method is ₹ 363.31**

**QUESTION 17**
**MULTI PERIOD DDM WITH TRANSITION**

The current EPS of M/s VEE Ltd. is ₹ 4. The company has shown an extraordinary growth of 40% in its earnings in the last few year This high growth rate is likely to continue for the next 5 years after which growth rate in earnings will decline from 40% to 10% during the next 5 years and remain stable at 10% thereafter. The decline in the growth rate during the five year transition period will be equal and linear. Currently, the company' s pay-out ratio is 10%. It is likely to remain the same for the next five years and from the beginning of the sixth year till the end of the 10th year, the pay-out will linearly increase and stabilize at 50% at the end of the 10th year. The post tax cost of capital is 17% and the PV factors are given below:

Years	1	2	3	4	5	6	7	8	9	10
<b>PVIF @17%</b>	0.855	0.731	0.625	0.534	0.456	0.390	0.333	0.285	0.244	0.209

You are required to calculate the intrinsic value of the company's stock based on expected dividend. If the current market price of the stock is ₹ 125, suggest if it is advisable for the investor to invest in the company's stock or not.

## Answer

### Working Notes:

#### i. Computation of Growth Rate in Earning and EPS

Year	1	2	3	4	5	6	7	8	9	10
Growth in Earning	40%	40%	40%	40%	40%	34%	28%	22%	16%	10%
EPS (₹)	5.60	7.84	10.98	15.37	21.51	28.82	36.89	45.00	52.20	57.42

#### ii. Computation of Payout Ratio and Dividend

Year	1	2	3	4	5	6	7	8	9	10
Payout Ratio	10%	10%	10%	10%	10%	18%	26%	34%	42%	50%
Dividend (₹)	0.56	0.78	1.10	1.54	2.15	5.19	9.59	15.30	21.92	28.71

#### iii. Calculation of PV of Dividend

Year	Dividend (₹)	PVF	PV of Dividend (₹)
1	0.56	0.855	0.48
2	0.78	0.731	0.57
3	1.10	0.625	0.69
4	1.54	0.534	0.82
5	2.15	0.456	0.98
6	5.19	0.390	2.02
7	9.59	0.333	3.19
8	15.30	0.285	4.36
9	21.92	0.244	5.35
10	28.71	0.209	6.00
			<b>24.46</b>

$$TV = \frac{28.71(1.10)}{0.17-0.10} \times 0.209 = ₹ 94.29 \text{ Intrinsic Value} = ₹ 24.46 + ₹ 94.29 = ₹ 118.75$$

Since the Intrinsic Value of Equity share is less than current market price, it is not advisable to invest in the same.

## QUESTION 18

### COMPLEX SUM

You are interested in buying some equity stocks of RK Ltd. The company has 3 divisions operating in different industries. Division A captures 10% of its industries sales which is forecasted to be ₹ 50 crore for the industry. Division B and C captures 30% and 2% of their respective industry's sales, which are expected to be ₹ 20 crore and ₹ 8.5 crore respectively. Division A traditionally had a 5% net income margin, whereas divisions B and C had 8% and 10% net income margin respectively. RK Ltd. has 3,00,000 shares of equity stock outstanding, which sell at ₹ 250.

The company has not paid dividend since it started its business 10 years ago. However from the market sources you come to know that RK Ltd. will start paying dividend in 3 years time and the pay-out ratio is 30%. Expecting this dividend, you would like to hold the stock for 5 year. By analysing the past financial statements, you have determined that RK Ltd.'s required rate of return is 18% and that P/E ratio of 10 for the next year and on ending P/E ratio of 20 at the end of the fifth year are appropriate.

Required:

- i. Would you purchase RK Ltd. equity at this time based on your one year forecast?
- ii. If you expect earnings to grow @ 15% continuously, how much are you willing to pay for the stock of RK Ltd ?

Ignore taxation.

PV factors are given below :

Years	1	2	3	4	5
<b>PVIF@ 18%</b>	0.847	0.718	0.609	0.516	0.437

## Answer

### Working Notes:

#### Computation of Earning Per Share (EPS)

Particulars		Amount (₹)
Margin of Division A	(₹ 50 crore x 10% x 5%)	25,00,000
Margin of Division B	(₹ 20 crore x 30% x 8%)	48,00,000
Margin of Division C	(₹ 8.5 crore x 2% x 10%)	1,70,000
		74,70,000
No. of Equity Shares		3,00,000
EPS		₹ 24.90

#### i. Market Price based on One Year Forecast

Expected Market Price at the end of the year = ₹ 24.90 x 10 = ₹ 249

PV of the Expected Price = ₹ 249 x 0.847 = ₹ 210.90

I would NOT like to purchase the share as the expected market price of shares is less than its current price of ₹ 250.

#### ii. If Earning is expected to grow @ 15%

Year	EPS (₹)	Dividend (₹)	PVF@18%	PV (₹)
1	28.64	---	0.847	---
2	32.93	---	0.718	---
3	37.87	11.36	0.609	6.92
4	43.55	13.07	0.516	6.74
5	50.08	15.02	0.437	6.56
				20.22

Share Price after 5 years =  $\frac{15.02(1.15)}{0.18 - 0.15} = ₹ 575.77$

PV of the Market Price after 5 years = ₹ 575.77 X 0.437 = ₹ 251.61

Total PV of Inflows = ₹ 20.22 + ₹ 251.61 = ₹ 271.83

**Thus, the maximum price I would be willing to pay for the share shall be ₹ 271.83.**

**QUESTION 19**

**EQUITY, DEBT AND ASSET BETA**

Equity of KGF Ltd. (KGFL) is ₹ 410 Crores, its debt, is worth ₹ 170 Crores. Printer Division segments value is attributable to 74%, which has an Asset Beta ( $\beta_p$ ) of 1.45, balance value is applied on Spares and Consumables Division, which has an Asset Beta ( $\beta_{sc}$ ) of 1.20 KGFL Debt beta ( $\beta_D$ ) is 0.24.

You are required to calculate:

- i. Equity Beta ( $\beta_E$ ),
- ii. Ascertain Equity Beta ( $\beta_E$ ), if KGF Ltd. decides to change its Debt Equity position by raising further debt and buying back of equity to have its Debt Equity Ratio at 1.90. Assume that the present Debt Beta ( $\beta_{D1}$ ) is 0.35 and any further funds raised by way of Debt will have a Beta ( $\beta_{D2}$ ) of 0.40.
- iii. Whether the new Equity Beta ( $\beta_E$ ) justifies increase in the value of equity on account of leverage?

## Answer

### i. Equity Beta

To calculate Equity Beta first we shall calculate Weighted Average of Asset Beta as follows:

$$= 1.45 \times 0.74 + 1.20 \times 0.26 = 1.073 + 0.312 = 1.385$$

Now we shall compute Equity Beta using the following formula:

$$\beta_{\text{Asset}} = \beta_{\text{Equity}} \left[ \frac{E}{E + D(1 - t)} \right] + \beta_{\text{Debt}} \left[ \frac{D(1 - t)}{E + D(1 - t)} \right]$$

Accordingly,

$$1.385 = \beta_{\text{Equity}} \left[ \frac{410}{410 + 170} \right] + \beta_{\text{Debt}} \left[ \frac{170}{410 + 170} \right]$$

$$1.385 = \beta_{\text{Equity}} \left[ \frac{410}{580} \right] + 0.24 \left[ \frac{170}{580} \right]$$

$$\beta_{\text{Equity}} = 1.86$$

### ii. Equity Beta on change in Capital Structure

Particulars	Value
Total Value of Firm (Equity ₹ 410 cr + Debt ₹ 170 cr)	₹ 580 Cr
Desired Debt Equity Ratio	1.90 : 1.00
Desired Debt Level = $\frac{\text{Total Value} \times \text{Debt Ratio}}{\text{Debt Ratio} + \text{Equity Ratio}}$	₹ 380 Cr
Less: Value of Existing Debt	(₹ 170 Cr)
Value of Debt to be Raised	₹ 210 Cr

$$\begin{aligned} \text{Equity after Repurchase} &= \text{Total value of Firm} - \text{Desired Debt Value} \\ &= ₹ 580 \text{ Cr} - ₹ 380 \text{ Cr} = ₹ 200 \text{ Cr} \end{aligned}$$

#### Weighted Average Beta of KGFL:

Source of Finance	Investment (₹ Cr)	Weight	Beta of the Division	Weighted Beta
Equity	200	0.345	$\beta_{(E=X)}$	0.345x
Debt – 1	170	0.293	0.35	0.103
Debt – 2	210	0.362	0.40	0.145
	<b>580</b>	<b>Weighted Average Beta</b>		<b>0.248 + (0.345x)</b>

$$\begin{aligned}\beta_{KGFL} &= 0.248 + 0.345x \\ 1.385 &= 0.248 + 0.345x \\ 0.345x &= 1.385 - 0.248 \\ X &= 1.137/0.345 = 3.296 \\ \beta_{KGFL} &= 3.296\end{aligned}$$

- iii. Yes, it justifies the increase as it leads to increase in the Value of Equity due to increase in Beta.

**QUESTION 20****RELATIVE VALUATION APPROACH**

A company has an EPS of ₹ 2.5 for the last year and the DPS of ₹ 1. The earnings is expected to grow at 2% a year in long run. Currently it is trading at 7 times its earnings. If the required rate of return is 14%, compute the following:

- i. An estimate of the P/E ratio using Gordon growth model.
- ii. The Long-term growth rate implied by the current P/E ratio.

## Answer

**i. Estimation of P/E Ratio using Gordon Growth Model**

$$k_e = \frac{D_1}{P} + g$$

$$0.14 = \frac{1(1.02)}{P} + 0.02$$

$$P = ₹ 8.50$$

$$PE \text{ Ratio} = \frac{Rs.8.50}{Rs.2.50} = 3.40$$

**ii. Long Term Growth Rate implied**

Based on Current PE Ratio, the price per share = ₹ 2.50 x 7 Times = ₹ 17.50

We know that

$$P = D_0(1+g) / (k_e - g)$$

$$₹ 17.50 = ₹ 1(1+g) / (0.14 - g)$$

$$17.50 \times 0.14 - 17.50g = 1 + g$$

$$g = 0.0784 \text{ i.e. } 7.84\%$$

REVISION

STRATEGIC FINANCIAL  
MANAGEMENT

BOND VALUATION

**QUESTION 21**

**BOND REFUNDING DECISION**

Tangent Ltd. is considering calling ₹ 3 crores of 30 years, ₹ 1,000 bond issued 5 years ago with a coupon interest rate of 14 per cent. The bonds have a call price of ₹ 1,150 and had initially collected proceeds of ₹ 2.91 crores since a discount of ₹ 30 per bond was offered. The initial floating cost was ₹ 3,90,000. The Company intends to sell ₹ 3 crores of 12 per cent coupon rate, 25 years bonds to raise funds for retiring the old bonds. It proposes to sell the new bonds at their par value of ₹ 1,000. The estimated floatation cost is ₹ 4,25,000. The company is paying 40% tax and its after tax cost of debt is 8 per cent. As the new bonds must first be sold and then their proceeds to be used to retire the old bonds, the company expects a two months period of overlapping interest during which interest must be paid on both the old and the new bonds. You are required to evaluate the bond retiring decision. [PVIFA 8%, 25 = 10.675]



**b. New bond**

(i) Interest cost before tax ( $0.12 \times 3$ crores)	36,00,000	
Less tax @ 40%	<u>14,40,000</u>	
After tax interest		21,60,000
(ii) Tax savings from amortisation of floatation cost ( $0.4 \times 4,25,000/25$ )		<u>(6,800)</u>
Annual after tax payment under new Bond (B)		<b><u>21,53,200</u></b>
Annual Cash Flow Saving (A) – (B)		<b><u>3,49,600</u></b>

**QUESTION 22**

## PASSIVE MANAGEMENT AND IMMUNIZATION

The following data are available for three bonds A, B and C. These bonds are used by a bond portfolio manager to fund an outflow scheduled in 6 years. Current yield is 9%. All bonds have face value of ₹100 each and will be redeemed at par. Interest is payable annually.

Bond	Maturity (Years)	Coupon rate
A	10	10%
B	8	11%
C	5	9%

- i. Calculate the duration of each bond.
- ii. The bond portfolio manager has been asked to keep 45% of the portfolio money in Bond A. Calculate the percentage amount to be invested in bonds B and C that need to be purchased to immunise the portfolio.
- iii. After the portfolio has been formulated, an interest rate change occurs, increasing the yield to 11%. The new duration of these bonds are: Bond A = 7.15 Years, Bond B = 6.03 Years and Bond C = 4.27 years.

Is the portfolio still immunized? Why or why not?

- iv. Determine the new percentage of B and C bonds that are needed to immunize the portfolio. Bond A remaining at 45% of the portfolio.

Present values be used as follows :

Present Values	$t_1$	$t_2$	$t_3$	$t_4$	$t_5$
$PVIF_{0.09,t}$	0.917	0.842	0.772	0.708	0.650

Present Values	$t_6$	$t_7$	$t_8$	$t_9$	$t_{10}$
$PVIF_{0.09,t}$	0.596	0.547	0.502	0.460	0.4224

## Answer

### i. Calculation of Bond Duration

#### Bond A

Year	Cash flow	P.V. @ 9%		Proportion of bond value	Proportion of bond value x time (years)
1	10	0.917	9.17	0.086	0.086
2	10	0.842	8.42	0.079	0.158
3	10	0.772	7.72	0.073	0.219
4	10	0.708	7.08	0.067	0.268
5	10	0.650	6.50	0.061	0.305
6	10	0.596	5.96	0.056	0.336
7	10	0.547	5.47	0.051	0.357
8	10	0.502	5.02	0.047	0.376
9	10	0.460	4.60	0.043	0.387
10	110	0.4224	46.46	0.437	4.370
			<b>106.40</b>	<b>1.000</b>	<b>6.862</b>

Duration of the bond is 6.862 years or 6.86 year

#### Bond B

Year	Cash flow	P.V. @ 9%		Proportion of bond value	Proportion of bond value x time (years)
1	11	0.917	10.087	0.091	0.091
2	11	0.842	9.262	0.083	0.166
3	11	0.772	8.492	0.076	0.228
4	11	0.708	7.788	0.070	0.280
5	11	0.650	7.150	0.064	0.320
6	11	0.596	6.556	0.059	0.354
7	11	0.547	6.017	0.054	0.378
8	111	0.502	55.772	0.502	4.016
			<b>111.224</b>	<b>1.000</b>	<b>5.833</b>

Duration of the bond B is 5.833 years or 5.84 years

**Bond C**

Year	Cash flow	P.V. @ 9%		Proportion of bond value	Proportion of bond value x time (years)
1	9	0.917	8.253	0.082	0.082
2	9	0.842	7.578	0.076	0.152
3	9	0.772	6.948	0.069	0.207
4	9	0.708	6.372	0.064	0.256
5	109	0.650	70.850	0.709	3.545
		<b>100.00</b>		<b>1.000</b>	<b>4.242</b>

Duration of the bond C is 4.242 years or 4.24 years

**ii. Amount of Investment required in Bond B and C**

Period required to be immunized	6.000 Year
Less: Period covered from Bond A	3.087 Year
To be immunized from B and C	2.913 Year

Let proportion of investment in Bond B and C is b and c respectively then

$$b + c = 0.55 \quad (1)$$

$$5.883b + 4.242c = 2.913 \quad (2)$$

On solving these equations, the value of b and c comes 0.3534 or 0.3621 and 0.1966 or 0.1879 respectively and accordingly, the % of investment of B and C is 35.34% or 36.21% and 19.66 % or 18.79% respectively.

**iii. With revised yield the Revised Duration of Bond stands**

$$0.45 \times 7.15 + 0.36 \times 6.03 + 0.19 \times 4.27 = 6.20 \text{ year}$$

No portfolio is not immunized as the duration of the portfolio has been increased from 6 years to 6.20 years.

**iv. New percentage of B and C bonds that are needed to immunize the portfolio.**

Period required to be immunized	6.0000 Year
Less: Period covered from Bond A	3.2175 Year
To be immunized from B and C	2.7825 Year

**QUESTION 23**
**YIELD SPREAD**

A hypothetical company ABC Ltd. issued a 10% Debenture (Face Value of Rs. 1000) of the duration of 10 years, currently trading at Rs. 850 per debenture. The bond is convertible into 50 equity shares being currently quoted at Rs. 17 per share.

If yield on equivalent comparable bond is 11.80%, then calculate the spread of yield of the above bond from this comparable bond.

The relevant present value table is as follows.

Present Values	$t_1$	$t_2$	$t_3$	$t_4$	$t_5$	$t_6$	$t_7$	$t_8$	$t_9$	$t_{10}$
$PVIF_{0.11, t}$	0.901	0.812	0.731	0.659	0.593	0.535	0.482	0.434	0.391	0.352
$PVIF_{0.13, t}$	0.885	0.783	0.693	0.613	0.543	0.480	0.425	0.376	0.333	0.295

## Answer

Conversion Price = Rs. 50 x 17 = Rs. 850

Intrinsic Value = Rs. 850

Accordingly the yield (r) on the bond shall be :

$$\text{Rs. } 850 = \text{Rs. } 100 \text{ PVAF } (r, 10) + \text{Rs. } 1000 \text{ PVF } (r, 10)$$

Let us discount the cash flows by 11%

$$850 = 100 \text{ PVAF } (11\%, 10) + 1000 \text{ PVF } (11\%, 10)$$

$$850 = 100 \times 5.890 + 1000 \times 0.352 = 91$$

Now let us discount the cash flows by 13%

$$850 = 100 \text{ PVAF } (13\%, 10) + 1000 \text{ PVF } (13\%, 10)$$

$$850 = 100 \times 5.426 + 1000 \times 0.295 = -12.40$$

Accordingly, IRR

$$11\% + \frac{90.90}{90.90 - (-12.40)} \times (13\% - 11\%)$$

$$11\% + \frac{90.90}{103.30} \times (13\% - 11\%) = 12.76\%$$

The spread from comparable bond = 12.76% - 11.80% = 0.96%

**QUESTION 24**

**SEQUENTIAL DISCOUNTING AMBIGUOUS SUM**

Sonic Ltd. issued 8% 5 year bonds of ₹ 1,000 each having a maturity of 3 years. The present rate of interest is 12% for one year tenure. It is expected that Forward rate of interest for one year tenure is going to fall by 75 basis points and further by 50 basis points for next year. This bond has a beta value of 1.02 and is more popular in the market due to less credit risk.

Calculate:

- i. Intrinsic Value of bond.
- ii. Expected price of bond in the market.

## Answer

**i. Intrinsic value of Bond**

PV of Interest + PV of Maturity Value of Bond

Forward rate of interests

1st Year                      12%

2nd Year                      11.25%

3rd Year                      10.75%

$$\text{PV of interest} = \frac{₹ 80}{(1+0.12)} + \frac{₹ 80}{(1+0.12)(1+0.1125)} + \frac{₹ 80}{(1+0.12)(1+0.1125)(1+0.1075)} = ₹ 193.61$$

$$\text{PV of Maturity Value of Bond} = \frac{₹1000}{(1+0.12)(1+0.1125)(1+0.1075)} = ₹ 724.67$$

$$\text{Intrinsic value of Bond} = ₹ 193.61 + ₹ 724.67 = ₹ 918.28$$

**ii. Expected Price = Intrinsic Value x Beta Value**

$$= ₹ 918.28 \times 1.02 = ₹ 936.65$$

**QUESTION 25**

**FEATURES OF OCD**

The following is the data related to 9% Fully convertible (into Equity Shares) debentures issued by Delta Ltd. at ₹ 1000.

Market Price of 9% Debenture	₹ 1,000
Conversion Ratio (No. of shares)	25
Straight Value of 9% Debentures	₹ 800
Market price of equity share on the date of conversion	₹ 30
Expected Dividend per share	₹ 1

Calculate:

- i.** Conversion value of Debenture;
- ii.** Market Conversion Price;
- iii.** Conversion Premium per share;
- iv.** Ratio of Conversion Premium;
- v.** Premium over straight Value of Debenture;
- vi.** Favourable Income Differential per share; and
- vii.** Premium pay back period

## Answer

**i. Conversion Value of Debenture**

$$= \text{Market Price of one Equity Share} \times \text{Conversion Ratio}$$

$$= ₹ 30 \times 25 = ₹ 750$$

**ii. Market Conversion Price**

$$= \frac{\text{Market Price Convertible Debenture}}{\text{Conversion Ratio}} = \frac{1000}{25} = ₹ 40$$

**iii. Conversion Premium per share**

$$\text{Market Conversion Price} - \text{Market Price of Equity Share}$$

$$= ₹ 40 - ₹ 30 = ₹ 10$$

**iv. Ratio of Conversion Premium**

$$\frac{\text{Conversion premium per share}}{\text{Market Price of Equity Share}} = \frac{10}{30} \times 100 = 33.33\%$$

**v. Premium over Straight Value of Debenture**

$$\frac{\text{Market Price of Convertible Bond}}{\text{Straight Value of Bond}} - 1 = \frac{1000}{800} - 1 = 25\%$$

**vi. Favourable income differential per share**

$$\frac{\text{Coupon Interest from Debenture} - \text{Conversion Ratio} \times \text{Dividend Per Share}}{\text{Conversion Ratio}}$$

$$\frac{90 - 25 \times 1}{25} = ₹ 2.6$$

**vii. Premium pay back period**

$$\frac{\text{Conversion premium per share}}{\text{Favourable Income Differential Per Share}} = \frac{10}{2.6} = 3.85 \text{ years}$$

# REVISION

## STRATEGIC FINANCIAL MANAGEMENT

---

## MUTUAL FUNDS

### QUESTION 26

#### PLAN TYPES

Cinderella Mutual Fund, an approved mutual fund, sponsored open -ended equity oriented scheme "Rudolf Opportunity Fund". There are three plans under the scheme viz. 'A' - Dividend Re-investment plan, 'B' - Bonus plan and 'C' - Growth plan.

At the time of initial public offer on 1-4-2009, Mr. Amit, Mr. Ashish and Mr. Arun, three investors invested ₹ 2,00,000 each at face value of ₹ 10 per unit and chosen plan 'B', 'C' and 'A' respectively.

The particulars of the fund over the period are as follows:

Date	Dividend %	Bonus Ratio	Net Asset Value per unit (₹)		
			Plan A	Plan B	Plan C
31.07.2013	10	-	30.70	31.20	35.40
31.03.2014	35	5:4	58.42	31.05	58.25
30.10.2017	20	-	42.18	26.45	56.45
15.03.2018	12.50	-	46.45	27.72	62.78
31.03.2018	-	1:3	45.20	20.05	67.12
25.03.2019	20	1:4	48.10	19.95	71.42
31.07.2019	-	-	53.75	22.98	82.07

On 31st July, 2019, all the three investors redeemed all the balance units.

1. Consider the following:
  - a. Long-term capital gain is exempt from Income-tax.
  - b. Short-term capital gain is subject to 10% Income-tax.
  - c. Security Transaction Tax is 0.2% only on sale/ redemption of units.
  - d. Ignore Education Cess.

2. You are required:
- i. To calculate the Effective Yield per annum (annual rate of return) of each of the investors.
  - ii. To suggest the name of investor with the highest Effective Yield per annum with the difference to his nearest investor.

(Show your calculations up to two decimal points)

## Answer

**i. Calculation of effective yield per annum of each of the investors**

**Mr. Arun Plan A Dividend Reinvestment**

(Amount in ₹)

Date	Investment	Dividend payout (%)	Dividend Re-invested (Closing Units X Face value of '10 X Dividend Payout %)	NAV	Units	Closing Unit Balance
01.04.2009	2,00,000.00			10.00	20,000.00	20,000.00
31.07.2013		10	20,000.00	30.70	651.47	20,651.47
31.03.2014		35	72,280.15	58.42	1,237.25	21,888.72
30.10.2017		20	43,777.44	42.18	1,037.87	22,926.59
15.03.2018		12.5	28,658.24	46.45	616.97	23,543.56
25.03.2019		20	47,087.12	48.10	978.94	24,522.50

Redemption value $24522.5 \times 53.75$	13,18,084.38
Less: Security Transaction Tax (STT) is 0.2%	<u>2636.17</u>
Net amount received	13,15,448.21
Less: Short term capital gain tax @ 10% on 978.94 ( $53.64^* - 48.10^{\approx}$ ) = 5423.33	<u>542.33</u>
Net of tax	13,14,905.88
Less: Investment	<u>2,00,000.00</u>
	<u>11,14,905.88</u>

\* $(53.75 - \text{STT @ } 0.2\%) \approx$  This value can also be taken as zero

$$\text{Annual average return (\%)} = \frac{11,14,905.88}{2,00,000} \times \frac{12}{124} \times 100 = 53.95\%$$

**Mr. Amit Plan B – Bonus**

(Amount in ₹)

Date	Units	Bonus units	Total Balance	NAV per unit
01.04.2009	20,000		20,000	10
31.03.2014		25,000	45,000	31.05
31.03.2018		15,000	60,000	20.05
25.03.2019		15,000	75,000	19.95

Redemption value 75,000 × 22.98	17,23,500
Less: Security Transaction Tax (STT) is 0.2%	<u>3447</u>
Net amount received	17,20,053
Less: Short term capital gain tax @ 10%	
15,000 × (22.93 <sup>†</sup> – 19.95) = 44,700	<u>4470</u>
Net of tax	17,15,583
Less: Investment	<u>2,00,000</u>
Net gain	<u>15,15,583</u>

†(22.98 – STT @ 0.2%)

$$\text{Annual average return (\%)} = \frac{15,15,583}{2,00,000} \times \frac{12}{124} \times 100 = 73.33 \%$$

**Mr. Ashish Plan C – Growth**

Particulars	(Amount in ₹)
Redemption value 20,000 × 82.07	16,41,400.00
Less: Security Transaction Tax (S.T.T) is 0.2%	<u>3282.80</u>
Net amount received	16,38,117.20
Less: Short term capital gain tax @ 10%	<u>0.00</u>
Net of tax	16,38,117.20
Less: Investment	<u>2,00,000.00</u>
Net gain	<u>14,38,117.20</u>

$$\text{Annual average return (\%)} = \frac{14,38,117.20}{2,00,000} \times \frac{12}{124} \times 100 = 69.59 \%$$

- ii. Mr. Amit (Bonus Plan) earns the highest effective yield per annum of 73.33% and the difference to his nearest investor Mr. Ashish is 3.74 (73.33 – 69.59%).

*Note: Alternatively, figure of \* and † can be taken as without net of Tax because, as per Proviso 5 of Section 48 of IT Act, no deduction of STT shall be allowed in computation of Capital Gain.*

**In such case:**

Mr. Arun Plan A – Short term capital gains tax would be Rs 553.10. Accordingly Net of tax will be ₹ 13,14,895.10 and the net gain would be Rs 11,14,895.10.

Mr. Amit Plan B – Bonus Plan – Short term capital gains tax would be Rs 4,545. Accordingly Net of tax will be ₹17,15,508 and the net gain would be Rs 15,15,508.

**QUESTION 27****BACK CALCULATION OF NAV**

On 01-07-2016, Mr. X Invested ₹ 50,000/- at initial offer in Mutual Funds at a face value of ₹ 10 each per unit. On 31-03-2017, a dividend was paid @ 10% and annualized yield was 120%. On 31-03-2018, 20% dividend and capital gain of ₹ 0.60 per unit was given. Mr. X redeemed all his 6271.98 units when his annualized yield was 71.50% over the period of holding. Calculate NAV as on 31-03-2017, 31-03-2018 and 31-03-2019.

For calculations consider a year of 12 months.

## Answer

Yield for 9 months  $(120\% \times 9/12) = 90\%$

Market value of Investments as on 31.03.2017 = ₹ 50,000/- + (₹ 50,000 x 90%) = ₹ 95,000/-

Therefore, NAV as on 31.03.2017 =  $(₹ 95,000 - ₹ 5,000)/5,000 = ₹ 18.00$

Since dividend was reinvested by Mr. X, additional units acquired

$$= \frac{₹ 5,000}{₹ 18} = 277.78 \text{ unit}$$

Therefore, units as on 31.03.2017 =  $5,000 + 277.78 = 5,277.78$

Alternatively, units as on 31.03.2017 =  $(₹ 95,000/₹18) = 5,277.78$

Dividend as on 31.03.2018 =  $5,277.78 \times ₹ 10 \times 0.2 = ₹10,555.56$

Capital Gain  $(5277.78 \times ₹ 0.60) = ₹ 3,166.67$

₹13,722.23

Let X be the NAV on 31.03.2018, then number of new units reinvested will be ₹13,722.23/X.

Accordingly, 6,271.98 units shall consist of reinvested units and 5277.78 (as on 31.03.2017).

**Thus, by way of equation it can be shown as follows:**

$$6,271.98 = \frac{₹ 13,722.23}{X} + 5,277.78$$

Therefore, NAV as on 31.03.2018 =  $₹ 13,722.23/(6,271.98 - 5,277.78) = ₹ 13.80$

NAV as on 31.03.2019 =  $₹ 50,000 (1+0.715 \times 33/12)/6,271.98 = ₹23.656$

**QUESTION 28**
**FAMA MEASURE OF NET SELECTIVITY**

The returns of a portfolio A and market portfolio for the last 12 months are indicated as follows:

Month	Portfolio A	Market Portfolio
January	- 0.52	0.82
February	2.20	0.04
March	2.17	2.80
April	4.17	1.72
May	2.04	0.27
June	3.00	0.39
July	1.99	1.95
August	4.00	0.64
September	-1.38	1.53
October	2.67	2.70
November	3.99	2.52
December	1.86	2.09
Standard Deviation ( $\sigma$ )	1.6223	0.9498

- i. You are required to find out the monthly returns attributable to the sheer skill of the Portfolio Manager.
- ii. What part of the monthly return is attributable to the higher risk assumed by the Portfolio Manager?

Assume that the risk-free rate of return is 12% per annum and the portfolio is fully diversified.

## Answer

i. The monthly risk free rate of return =  $(12\%/12) = 1\%$

Month	$R_A$	$R_M$
January	-0.52	0.82
February	2.20	0.04
March	2.17	2.80
April	4.17	1.72
May	2.04	0.27
June	3.00	0.39
July	1.99	1.95
August	4.00	0.64
September	-1.38	1.53
October	2.67	2.70
November	3.99	2.52
December	1.86	2.09
	26.19	17.47
Average Returns	2.1825	1.4558

Average Portfolio Return ( $R_p$ ) = 2.1825

Average Portfolio Return ( $R_m$ ) = 1.4558

Portfolio Risk ( $\sigma_p$ ) = 1.6223

Market Risk ( $\sigma_m$ ) = 0.9498

**Since portfolio A is fully diversified then it can be computed with a portfolio whose beta ( $\beta$ ) can be found as follows:**

$$\sigma_m^2 \times \beta^2 = \sigma_p^2$$

$$\beta = \frac{\sigma_p}{\sigma_m} = \frac{1.6223}{0.9498} = 1.708$$

Therefore, portfolio A is comparable to a portfolio whose Beta is 1.708.

**Expected monthly returns on such portfolio can be calculated as follows:**

$$R_p^1 = R_f + \beta(R_m - R_f)$$

$$= 1\% + 1.708 (1.4558\% - 1.0000\%)$$

$$= 1.7785\%$$

$$\begin{aligned} \text{Return due to the net selectivity} &= R_P - R_p^1 \\ &= 2.1825\% - 1.7785\% = 0.404\% \text{ per month} \end{aligned}$$

ii. **The returns due to higher risk assumed by the portfolio manager**

$$= 1.7785\% - 1.4558\% = 0.3227\% \text{ per month}$$

**QUESTION 29**

**INDIFFERENCE POINT NEW TYPE**

Mr. Alex, a practicing Chartered Accountant, can earn a return of 15 percent by investing in equity shares on his own. He is considering a recently announced equity based mutual fund scheme in which initial expenses are 6 percent and annual recurring expenses are 2 percent.

- i. How much should the mutual fund earn to provide Mr. Alex a return of 15 percent per annum?
- ii. Mr. Alex's current Annual Professional Income is ₹ 40 Lakhs. His portfolio value is ₹ 50 Lakhs and now he is spending 10% of his time to manage his portfolio. If he spends this time on profession, his professional income will go up in same proportion. He is thinking to invest his entire portfolio into a Multicap Fund, assuming the fund's NAV will grow at 13% per annum (including dividend).

You are requested to advise Mr. Alex, whether he can invest the portfolio into Multicap Funds ? If so, what is the net financial benefit?

## Answer

i. Personal earnings of Mr. Alex =  $R_1 = 15\%$

Mutual Fund earnings =  $R_2$

$$R_2 = \frac{1}{1 - \text{Initial expenses}(\%)} R_1 + \text{Recurring expenses}(\%)$$

$$= \frac{1}{1-0.06} \times 15\% + 2\%$$

$$= 17.96\%$$

Mutual Fund earnings = 17.96%

ii. **Net financial benefit to Mr. Alex if he invests his portfolio in Fund:**

**Present Income of Mr. Alex**

	₹ Lakhs
Annual Professional Income (A)	40.00
Portfolio Value	50.00
Income on his Portfolio @ 15% (B)	7.50
Total Income (A) + (B)	47.50

**Expected Income of Mr. Alex after investing the Portfolio in Multi -cap Fund:**

	₹ Lakhs
Annual Professional Income (A)	40.00
Additional Professional Income (B)	4.00
Portfolio Value	50.00
Income on his Portfolio @ 13% (C)	6.50
Total Income (A) + (B) + (C)	50.50

**It is advisable to invest in Multi-cap Mutual Funds and devote the time on profession. He will get net benefit of ₹ 3 Lakhs (₹50.50 - ₹47.50)**

**QUESTION 30**
**NAV DETAILED**

The following particulars relating to Vishnu Fund Schemes:

Particulars	Value ₹ in Crores
1. Investment in Shares (at cost)	
a. Pharmaceuticals companies	79
b. Construction Industries	31
c. Service Sector Companies	56
d. IT Companies	34
e. Real Estate Companies	10
2. Investment in Bonds (Fixed Income)	
a. Listed Bonds (8000, 14% Bonds of ₹ 15,000 each)	12
b. Unlisted Bonds	7
3. No. of Units outstanding (crores)	4.2
4. Expenses Payable	3.5
5. Cash and Cash equivalents	1.5
6. Market expectations on listed bonds	8.842%

Particulars relating to each sector are as follows:

Sector	Index on Purchase date	Index on Valuation date
Pharmaceutical companies	260	465
Construction Industries	210	450
Service Sector Companies	275	480
IT Companies	240	495
Real Estate Companies	255	410

The fund has incurred the following expenses:

Consultancy and Management fees	₹ 480 Lakhs
Office Expenses	₹ 150 Lakhs
Advertisement Expenses	₹ 38 Lakhs

You are required to calculate the following:

- i. Net Asset Value of the fund
- ii. Net Asset Value per unit

- iii. If the period of consideration is 2 years, and the fund has distributed ₹ 3 per unit per year as cash dividend, ascertain the Net return (Annualized).
- iv. Ascertain the Expenses ratio.

## Answer

### i. Calculation of NAV of the Fund

			Crore ₹
1.	Value of Shares		
	a. Pharmaceutical Companies	$79 \times \frac{465}{260}$	141.288
	b. Construction Companies	$31 \times \frac{450}{210}$	66.429
	c. Service Sector Companies	$56 \times \frac{480}{275}$	97.745
	d. IT Companies	$34 \times \frac{495}{240}$	70.125
	e. Pharmaceutical Companies	$10 \times \frac{410}{255}$	16.078
2.	Investment in Bonds		
	a. Listed Bonds	$\frac{14}{8.842} \times 12$	19.00
	b. Unlisted Bonds		7.000
3.	Cash and Cash Equivalents		1.50
			419.165
	Less: Expense Payable		3.500
	NAV of the Fund		415.665

### ii. NAV of the Fund Per Unit

NAV of the Fund	₹ 415.665 crore
Number of Units	4.20 crore
NAV Per Unit (₹ 415.665 crore/ 4.20 crore)	₹ 98.97

**iii. Net Return**

<b>Initial Cost Per Unit</b>		
Investment in Shares	₹ 210 crore	
Bonds	₹ 19 crore	₹ 229 crore
Number of Units		4.20 crore
Cost Per Unit		₹ 54.52
<b>Return</b>		
Capital Gain	(₹ 98.97 – ₹ 54.52)	₹ 44.45
Dividend	₹ 3 x 2	₹ 6.00
		₹ 50.45
Annualised Return	$\frac{50.45}{54.52} \times \frac{1}{2}$	46.27%

**QUESTION 31****LOAD TYPE SUM**

During the year 2017 an investor invested in a mutual fund. The capital gain and dividend for the year was ₹ 3.00 per unit, which were re-invested at the year end NAV of ₹ 23.75. The investor had total units of 26,750 as at the end of the year. The NAV had appreciated by 18.75% during the year and there was an entry load of ₹ 0.05 at the time when the investment was made.

The investor lost his records and wants to find out the amount of investment made and the entry load in the mutual fund.

## Answer

$$\text{NAV in the Beginning of year} = \frac{\text{₹}23.75}{118.75} \times 100 = \text{₹}20$$

No. of Units after Bonus issue = 26,750

Let x be the No. of Units acquired then

$$26,750 = x + \frac{x \times 3}{23.75}$$

$$x = 23,750 \text{ units}$$

$$\text{Investment Amount} = 23,750 \text{ units} (\text{₹} 20 + \text{₹} 0.05) = \text{₹} 4,76,187.50$$

$$\text{Entry load} = \text{₹} 1,187.50 \text{ i.e. } (23750 \times \text{₹} 0.05)$$

**QUESTION 32****NAV CALCULATION**

A mutual fund raised ₹ 150 lakhs on April 1, 2018 by issue of 15 lakh units at ₹ 10 per unit. The fund invested in several capital market instruments to build a portfolio of ₹ 140 lakhs, Initial expenses amounted to ₹ 8 lakhs. During the month of April, the fund sold certain instruments costing ₹ 44.75 lakhs for ₹ 47 lakhs and used the proceeds to purchase certain other securities for ₹ 41.6 lakhs. The fund management expenses for the month amounted to ₹ 6 lakhs of which ₹ 50,000 was in arrears. The fund earned dividends amounting to ₹ 1.5 lakhs and it distributed 80% of the realized earnings. The market value of the portfolio on 30th April, 2018 was ₹ 147.85 lakhs.

An investor subscribed to 1000 units on April 1 and disposed it off at closing NAV on 30th April. Determine his annual rate of earnings.

## Answer

	Amount in ₹ lakhs	Amount in ₹ lakhs	Amount in ₹ lakhs
Opening Bank (150 - 140 - 8)	2.00		
Add: Proceeds from sale of securities	47.00		
Add: Dividend received	<u>1.50</u>	50.50	
Deduct:			
Cost of securities purchased	41.60		
Fund management expenses paid	5.50		
Capital gains distributed = 80% of (47 - 44.75)	1.80		
Dividend distributed =80% of 1.50	<u>1.20</u>	<u>50.10</u>	
Closing Bank			0.40
Closing market value of portfolio			<u>147.85</u>
			148.25
Less: Arrears of expenses			<u>0.50</u>
Closing Net Assets			<u>147.75</u>
Number of units (Lakhs)			15
Closing NAV per unit (147.75/15)			9.85

### Rate of Earning (Per Unit)

	Amount
Income received (₹ 1.20 + ₹ 1.80)/15	₹ 0.20
Loss: Loss on disposal (₹ 150 - ₹ 147.75)/15	<u>₹ 0.15</u>
Net earning	<u>₹ 0.05</u>
Initial investment	₹ 10.00
Rate of earning (monthly)	0.5%
Rate of earning (Annual)	6.00%

**QUESTION 33**

**ENTRY AND EXIT LOAD**

The unit price of Equity Linked Savings Scheme (ELSS) of a mutual fund is ₹ 10/-. The public offer price (POP) of the unit is ₹ 10.204 and the redemption price is ₹ 9.80.

Calculate:

- i. Front-end Load
- ii. Back end Load

## **Answer**

**Public Offer Price = NAV/ (1 – Front end Load)**

Public Offer Price: ₹ 10.204 and NAV: ₹ 10

Accordingly,

$$10.204 = 10/(1 - F)$$

$$F = 0.0199 \text{ say } 2\%$$

**Redemption Price = NAV/ (1 – Back End Load)**

$$₹ 9.80 = 10/ (1 - \text{Back End Load})$$

$$B = 0.0204 \text{ i.e. } 2.04\%$$

### **Alternative**

i. Front End Load =  $\frac{10.204 - 10.00}{10.00} = 0.0204 \text{ or } 2.04\%$

ii. Exit Load =  $\frac{10.00 - 9.80}{10.00} = 0.020 \text{ or } 2.00\%$

**QUESTION 34**
**MODIFIED SUM ON EFFECTIVE YIELD**

Mr. Y has invested in the three mutual funds (MF) as per the following details:

Particulars	MF 'X'	MF 'Y'	MF 'Z'
Amount of Investment (₹)	2,00,000	4,00,000	2,00,000
Net Assets Value (NAV) at the time of purchase (₹)	10.30	10.10	10
Dividend Received up to 31.03.2018 (₹)	6,000	0	5,000
NAV as on 31.03.2018 (₹)	10.25	10	10.20
Effective Yield per annum as on 31.03.2018 (percent)	9.66	-11.66	24.15

Assume 1 Year =365 days

Mr. Y has misplaced the documents of his investment. Help him in finding the date of his original investment after ascertaining the following:

- i. Number of units in each scheme;
- ii. Total NPV;
- iii. Total Yield; and
- iv. Number of days investment held.

## Answer

**i. Number of Units in each Scheme**

MF 'X'	$\frac{\text{₹ } 2,00,000}{\text{₹ } 10.30}$	= 19,417.48
MF 'Y'	$\frac{\text{₹ } 4,00,000}{\text{₹ } 10.10}$	= 39,603.96
MF 'Z'	$\frac{\text{₹ } 2,00,000}{\text{₹ } 10.00}$	= 20,000.00

**ii. Total NAV on 31.03.2018**

MF 'X'	= 19,417.48 x ₹ 10.25	₹ 1,99,029.17
MF 'Y'	= 39,603.96 x ₹ 10.00	₹ 3,96,039.60
MF 'Z'	= 20,000.00 x ₹ 10.20	₹ 2,04,000.00
<b>Total</b>		<b>₹ 7,99,068.77</b>

**iii. Total Yield**

	Capital Yield	Dividend Yield	Total
MF 'X'	₹ 1,99,029.17 - ₹ 2,00,000 = - ₹ 970.83	₹ 6,000	₹ 5,029.17
MF 'Y'	₹ 3,96,039.60 - ₹ 4,00,000 = - ₹ 3,960.40	Nil	- ₹ 3,960.40
MF 'Z'	₹ 2,04,000 - ₹ 2,00,000 = ₹ 4,000	₹ 5,000	₹ 9,000.00
<b>Total</b>			<b>₹ 10,068.77</b>

$$\text{Total Yield} = \frac{\text{₹ } 10,068.77}{\text{₹ } 8,00,000} \times 100 = 1.2586\%$$

**iv. No. of Days Investment Held**

	MF 'X'	MF 'Y'	MF 'Z'
Let No. of days be	X	Y	Z
Initial Investment (₹)	2,00,000	4,00,000	2,00,000
Yield (₹)	5,029.17	-3,960.40	9,000.00
Yield (%)	2.5146	- 0.9901	4.5
Period of Holding (Days)	$\frac{2.5146}{9.66} \times 365$ = 95 Days	$\frac{-0.9901}{-11.66} \times 365$ = 31 Days	$\frac{4.5}{24.15} \times 365$ = 68 Days

**Date of Original Investment**    26.12.17                      28.02.18                      22.01.18

# REVISION

# STRATEGIC FINANCIAL MANAGEMENT

## MERGERS & ACQUISITIONS

### QUESTION 35

### COST OF ACQUISITION

Given is the following information:

	<b>Day Ltd.</b>	<b>Night Ltd.</b>
Net Earnings	₹ 5 crores	₹ 3.5 crores
No. of Equity Shares	10,00,000	7,00,000

The shares of Day Ltd. and Night Ltd. trade at 20 and 15 times their respective P/E ratios. Day Ltd. considers taking over Night Ltd. By paying ₹ 55 crores considering that the market price of Night Ltd. reflects its true value. It is considering both the following options:

- i. Takeover is funded entirely in cash.
- ii. Takeover is funded entirely in stock.

You are required to calculate the cost of the takeover and advise Day Ltd. on the best alternative.

## Answer

### Working Notes:

	Day Ltd.	Night Ltd.
Net Earnings	₹ 5 crores	₹ 3.5 crores
No. of Equity Shares	10,00,000	7,00,000
EPS	50	50
P/E	20 times	15 times
MPS	₹ 1000	₹ 750
Market Value	1,00,00,00,000	52,50,00,000

**i. If takeover is funded by Cash**

Since Market Price of Night Ltd. reflects its full value, cost of takeover to Day Ltd is 55 crore – 52.50 crore = ₹ 2.5 crore.

**ii. If the takeover is funded by stock**

Number of shares to be issued to Night Ltd. = ₹ 55 Crore / ₹ 1000 = 550000 Lakhs

Market Value of Merged Firm = ₹ 1,00,00,00,000 + ₹ 52,50,00,000

= ₹ 1,52,50,00,000 i.e. ₹ 152.50 Crore

Proportion that Night Ltd.'s shareholders get in Day Ltd.'s Capital Structure will be:

$$= \frac{5.5 \text{ Lakhs}}{5.5 \text{ Lakhs} + 10 \text{ Lakhs}} = 0.3548$$

True Cost of Merger = ₹ 152.50 Crore x 0.3548 – ₹ 55 Crore = -₹ 0.893 Crore

Since true cost is negative in case of funding from stock, Day Ltd. would better off by funding the takeover by stock.

**QUESTION 36**

## CASH DEAL VS STOCK DEAL INVOLVING EBITDA

TK Ltd. and SK Ltd. are both in the same industry. The former is in negotiation for acquisition of the latter. Information about the two companies as per their latest financial statements are given below:

	TK Ltd.	SK Ltd.
₹ 10 Equity shares outstanding	24 Lakhs	12 Lakhs
Debt:		
10% Debentures (₹ Lakhs)	1160	-
12.5% Institutional Loan (₹ Lakhs)	-	480
Earnings before interest, depreciation and tax (EBIDAT) (₹ Lakhs)	800.00	230.00
Market Price/Share (₹)	220.00	110.00

TK Ltd. plans to offer a price for SK Ltd. business, as a whole, which will be 7 times of EBIDAT as reduced by outstanding debt and to be discharged by own shares at market price.

SK Ltd. is planning to seek one share in TK Ltd. for every 2 shares in SK Ltd. based on the market price. Tax rate for the two companies may be assumed as 30%.

Calculate and show the following under both alternatives -TK Ltd.'s offer and SK Ltd.'s plan :

- i. Net consideration payable.
- ii. No. of shares to be issued by TK Ltd.
- iii. EPS of TK Ltd. after acquisition.
- iv. Expected market price per share of TK Ltd. after acquisition.
- v. State briefly the advantages to TK Ltd. from the acquisition.

Calculations may be rounded off to two decimals points.

## Answer

### As per TK Ltd.'s Offer

	₹ in lakhs
<b>(i) Net Consideration Payable</b>	
7 times EBIDAT, i.e. 7 x ₹ 230 lakh	1610
Less: Debt	<u>480</u>
	<u>1130</u>
<b>(ii) No. of shares to be issued by TK Ltd</b>	
₹ 1130 lakh/₹ 220 (rounded off) (Nos.)	5,13,600
<b>(iii) EPS of TK Ltd after acquisition</b>	
Total EBIDT (₹ 800 lakh + ₹ 230 lakh)	1030.00
Less: Interest (₹ 116 lakh + ₹ 60 lakh)	<u>176.00</u>
	854.00
Less: 30% Tax	<u>256.20</u>
Total earnings (NPAT)	<u>597.80</u>
Total No. of shares outstanding	29,13,600
(24 lakh + 5,13,600)	
EPS (₹ 597.80 lakh/ 29,13,600)	₹ 20.52

### (iv) Expected Market Price:

	₹ in lakhs
Pre-acquisition P/E multiple:	
EBIDAT	800.00
Less: Interest $(1160 \times \frac{10}{100})$	<u>116.00</u>
	684.00
Less: 30% Tax	<u>205.20</u>
	<u>478.80</u>
No. of shares (lakhs)	24
EPS	₹ 19.95
Hence, PE multiple (220/19.95)	11.03
Expected market price after acquisition (₹ 20.52 x 11.03)	₹ 226.34

**As per SK Ltd.'s Offer**

	₹ in lakhs
<b>(i) Net consideration payable</b> 12 lakhs shares x ₹ 110	1320
<b>(ii) No. of shares to be issued by TK Ltd</b> ₹ 1320 lakhs ÷ ₹ 220	6 lakh
<b>(iii) EPS of T Ltd after Acquisition</b> NPAT (as per earlier calculations)	597.80
Total no. of shares outstanding (24 lakhs + 6 lakhs)	30 lakh
Earning Per Share (EPS) ₹ 597.8/30 lakh	₹ 19.93
<b>(iv) Expected Market Price (₹ 19.93 x 11)</b>	219.23

**(v) Advantages of Acquisition to TK Ltd.**

Since the two companies are in the same industry, the following advantages could accrue:

- Synergy, cost reduction and operating efficiency.
- Better market share.
- Avoidance of competition

**QUESTION 37**
**JUSTIFIABLE EXCHANGE RATIO**

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.:

	<b>Abhiman Ltd.</b>	<b>Abhishek Ltd.</b>
Share Capital (₹)	200 lakh	100 lakh
Free Reserve and Surplus (₹)	800 lakh	500 lakh
Paid up Value per share (₹)	100	10
Free float Market Capitalisation (₹)	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:
  - i. Promoter's revised holding in the Abhiman Ltd.
  - ii. Free float market capitalization.
  - iii. Also calculate No. of Shares, Earning per Share (EPS) and Book Value (B.V.), if after acquisition of Abhishek Ltd., Abhiman Ltd. decided to :
    - a. Issue Bonus shares in the ratio of 1 : 2; and
    - b. Split the stock (share) as ₹ 5 each fully paid.

## 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	₹ 500	₹ 60
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	₹ 400	₹ 32
P/E Ratio	10	4
EPS	40	8
Profits (₹ 2 X 40 lakh)	₹ 80 lakh	-
(₹ 8 X 10 lakh)	-	₹ 80 lakh

**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>
		<b>Total</b>	<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	₹ 200 Lakh + ₹ 150 Lakh = ₹ 350 Lakh
Reserves	₹ 800 Lakh + ₹ 450 Lakh = ₹ 1,250 Lakh

Book Value  $\frac{\text{₹ } 350 \text{ Lakh} + \text{₹ } 1,250 \text{ Lakh}}{3.5 \text{ Lakh}} = \text{₹ } 457.14 \text{ per share}$

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

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

c.

**1. Promoter's holding**

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

Promoter's % =  $1.90/3.50 \times 100 = 54.29\%$

**2. Free Float Market Capitalisation**

Free Float Market =  $(3.5 \text{ Lakh} - 1.9 \text{ Lakh}) \times \text{₹ } 457.10$

Capitalisation = ₹ 731.36 Lakh

**3. (i) & (ii)**

Revised Capital  $\text{₹ } 350 \text{ Lakh} + \text{₹ } 175 \text{ Lakh} = \text{₹ } 525 \text{ Lakh}$

No. of shares before Split (F.V ₹ 100) 5.25 Lakh

No. of Shares after Split (F.V. ₹ 5 )  $5.25 \times 20 = 105 \text{ Lakh}$

EPS  $160 \text{ Lakh} / 105 \text{ Lakh} = 1.523$

Book Value  $\frac{\text{Cap. ₹ } 525 \text{ Lakh} + \text{₹ } 1075 \text{ Lakh}}{105 \text{ Lakh}}$

$= \text{₹ } 15.238 \text{ per share}$

**QUESTION 38**
**AMBIGUOUS SUM**

R Ltd. and S Ltd. operating in same industry are not experiencing any rapid growth but providing a steady stream of earnings. R Ltd.'s management is interested in acquisition of S Ltd. due to its excess plant capacity. Share of S Ltd. is trading in market at ₹ 3.20 each. Other data relating to S Ltd. is as follows:

**Balance Sheet of S Ltd.**

Liabilities	Amount (₹)	Assets	Amount (₹)
Current Liabilities	1,59,80,000	Current Assets	2,48,75,000
Long Term Liabilities	1,28,00,000	Other Assets	94,00,000
Reserve & Surplus	2,79,95,000	Property Plants & Equipment	3,45,00,000
Share Capital (80 Lakhs shares of ₹ 1.5 each)	1,20,00,000		
<b>Total</b>	<b>6,87,75,000</b>	<b>Total</b>	<b>6,87,75,000</b>

Particulars	R Ltd. (₹)	S Ltd. (₹)	Combined Entity (₹)
Profit after Tax	86,50,000	49,72,000	1,21,85,000
Residual Net Cash Flows per year	90,10,000	54,87,000	1,85,00,000
Required return on equity	13.75%	13.05%	12.5%

You are required to compute the following:

- i. Minimum price per share S Ltd. should accept from R Ltd.
- ii. Maximum price per share R Ltd. shall be willing to offer to S Ltd.
- iii. Floor Value of per share of S Ltd., whether it shall play any role in decision for its acquisition by R Ltd.

## Answer

**i. Calculation of Minimum price per share S Ltd. should accept from R Ltd.**

$$\text{Value of S Ltd.} = \frac{\text{Residual Cash Flow}}{\text{Ke-g}} = \frac{54,87,000}{0.1305 - 0} = ₹ 4,20,45,977$$

$$\text{Value per share of S Ltd.} = \frac{4,20,45,977}{80,00,000} = ₹ 5.26$$

$$\text{Book Value of per share of S Ltd.} = \frac{3,99,95,000}{80,00,000} = ₹ 4.99 \text{ or } ₹ 5$$

Therefore, the minimum price per share S Ltd. should accept from R Ltd. is ₹ 5 (current book value)

**ii. Calculation of Maximum price per share R Ltd. shall be willing to offer to S Ltd.**

$$\text{Value of R Ltd.} = \frac{\text{Residual Cash Flow}}{\text{Ke-g}} = \frac{90,10,000}{0.1375 - 0} = ₹ 6,55,27,273$$

$$\text{Value of Combined entity} = \frac{1,85,00,000}{0.125 - 0} = ₹ 14,80,00,000$$

Value of synergy = Value of Combined entity – Individual values of R Ltd. and S Ltd.  
= ₹ 14,80,00,000 – (₹ 4,20,45,977 + ₹ 6,55,27,273) = ₹ 4,04,26,750

**Maximum price per share R Ltd. shall be willing to offer to S Ltd. shall be computed as follows:**

$$= \frac{\text{Value of S Ltd. as per Residual cash flows + Synergy benefits}}{\text{No. of Shares}}$$

$$= \frac{4,20,45,977 + 4,04,26,750}{80,00,000} = ₹ 10.31$$

**iii. Floor value of per share of S Ltd shall be ₹ 3.20 (current market price) and it shall not play any role in decision for the acquisition of S Ltd. as it is lower than its current book value.**

**QUESTION 39**
**CONN AND NEILSON MODEL**

C Ltd. & D Ltd. are contemplating a merger deal in which C Ltd. will acquire D Ltd. The relevant information about the firms are given as follows:

	<b>C Ltd.</b>	<b>D Ltd.</b>
Total Earnings (E) (in millions)	₹96	₹30
Number of outstanding shares (S) (in millions)	20	14
Earnings per share (EPS) (₹)	4.8	2.143
Price earnings ratio (P/E)	8	7
Market Price per share (P)(₹)	38.4	15

- i. What is the maximum exchange ratio acceptable to the shareholders of C Ltd., if the P/E ratio of the combined firm is 7?
- ii. What is the minimum exchange ratio acceptable to the shareholders of D Ltd., if the P/E ratio of the combined firm is 9?

## Answer

**i. Maximum exchange ratio acceptable to the shareholders of C Ltd.**

Market Price of share of C Ltd. (₹ 4.8 x 8)	₹ 38.40
No. of Equity Shares	20 Million
Market Capitalisation of C Ltd. (₹ 38.40 x 20 Million)	₹ 768 Million
Combined Earnings (₹ 96 + ₹ 30) Million	₹ 126 Million
Combined Market Capitalisation (₹ 126 Million x 7)	₹ 882 Million
Market Capitalisation of C Ltd. (₹ 38.40 x 20 Million)	₹ 768 Million
Balance for D Ltd.	₹ 114 Million

**Let D be the no. of equity shares to be issued to D Ltd. then,**

$$\frac{\text{₹ 114 Million}}{\left(\frac{126 \text{ Million}}{D + 20}\right) \times 7} = D$$

$D = 2.96875 \text{ Million Shares}$

$\text{Exchange Ratio} = 2.96875 / 14 = 0.212:1$

**ii. Minimum exchange ratio acceptable to the shareholders of D Ltd.**

Market Price of share of D Ltd.	₹ 15.00
No. of Equity Shares	14 Million
Market Capitalisation of D Ltd. (₹ 15.00 x 14 Million)	₹ 210 Million
Combined Earnings (₹ 96 + ₹ 30) Million	₹ 126 Million
Combined Market Capitalisation (₹ 126 Million x 9)	₹ 1134 Million
Balance for C Ltd.	₹ 924 Million

**Let D be the no. of equity shares to be issued to D Ltd. then,**

$$\frac{\text{₹ 210 Million}}{\left(\frac{126 \text{ Million}}{D + 20}\right) \times 9} = D$$

$D = 4.54545 \text{ Million Shares}$

$\text{Exchange Ratio} = 4.54545 / 14 = 0.325:1$

## REVISION

# STRATEGIC FINANCIAL MANAGEMENT DERIVATIVES ANALYSIS AND VALUATION

### QUESTION 40

#### **COST OF CARRY MODEL**

A future contract is available on R Ltd. that pays an annual dividend of ₹ 4 and whose stock is currently priced at ₹ 125. Each future contract calls for delivery of 1,000 shares to stock in one year, daily marking to market. The corporate treasury bill rate is 8%.

Required:

- i. Given the above information, what should the price of one future contract be ?
- ii. If the company stock price decreases by 6%, what will be the price of one futures contract ?
- iii. As a result of the company stock price decrease, will an investor that has a long position in one futures contract of R Ltd. realizes a gain or loss ? What will be the amount of his gain or loss ?

(Ignore margin and taxation, if any)

## Answer

- i.** Future Price = Spot + Cost of Carry – Dividend  
 $= ₹ 125 + (₹ 125 \times 0.08) - 4 = ₹ 131$   
Price of one future contract = 1000 share  $\times ₹ 131 = ₹ 1,31,000$
- ii.** Price decrease by 6 %  
Market Price =  $125 \times 94\% = 117.50$   
Then, price of one future contract  
 $= ₹ 117.50 + (₹ 117.50 \times 0.08) - 4 = ₹ 122.90$   
 $= ₹ 122.90 \times 1000 = ₹ 1,22,900$
- iii.** If the investor has taken a long position, decrease in price will result in loss for the investor.  
Amount of loss will be:  
 $₹ 1,31,000 - ₹ 1,22,900 = ₹ 8,100$

**QUESTION 41****BINOMIAL MODEL AT-RISK NEUTRAL VS WORLD PROBABILITY AND  
DELTA NEUTRAL PORTFOLIO APPROACH**

AB Ltd.'s equity shares are presently selling at a price of ₹ 500 each. An investor is interested in purchasing AB Ltd.'s shares. The investor expects that there is a 70% chance that the price will go up to ₹ 650 or a 30% chance that it will go down to ₹ 450, three months from now. There is a call option on the shares of the firm that can be exercised only at the end of three months at an exercise price of ₹ 550.

Calculate the following:

- i.** If the investor wants a perfect hedge, what combination of the share and option should he select ?
- ii.** Explain how the investor will be able to maintain identical position regardless of the share price.
- iii.** If the risk-free rate of return is 5% for the three months period, what is the value of the option at the beginning of the period ?
- iv.** What is the expected return on the option?

## Answer

i. To compute perfect hedge we shall compute Hedge Ratio ( $\Delta$ ) as follows:

$$\Delta = \frac{C_1 - C_2}{S_1 - S_2} = \frac{100 - 0}{650 - 450} = \frac{100}{200} = 0.50$$

The investor should purchase 0.50 share for every 1 call option

Or, the investor should purchase 1 share for every 2 Call Option.

ii. How the investor will be able to maintain his position if he purchase 0.50 share for 1 call option written.

a. If price of share goes upto ₹ 650 then value of purchased share will be:

Sale Proceeds of Investment (0.50 x ₹ 650) ₹ 325

Loss on account of Short Position (₹ 650 – ₹ 550) ₹ 100

₹ 225

b. If price of share comes down to ₹ 450 then value of purchased share will be:

Sale Proceeds of Investment (0.50 x ₹ 450) ₹ 225

iii. The Value of Option, say, P at the beginning of the period shall be computed as follows:

$$(\text{₹ } 250 - P) 1.05 = \text{₹ } 225$$

$$\text{₹ } 262.50 - 1.05P = \text{₹ } 225$$

$$\text{₹ } 37.5 = 1.05P$$

$$P = \text{₹ } 35.71$$

iv. Expected Return on the Option

$$\text{Expected Option Value} = (\text{₹ } 650 - \text{₹ } 550) \times 0.70 + \text{₹ } 0 \times 0.30 = \text{₹ } 70$$

$$\text{Expected Rate of Return} = \frac{70 - 35.71}{35.71} \times 100 = 96.02\%$$

**QUESTION 42**
**BLACK SCHOLES MODEL**

From the following data for certain stock, find the value of a call option:

Price of stock now	₹ 80
Exercise price	₹ 75
Standard deviation of continuously compounded annual return	0.40
Maturity period	6 months
Annual interest rate	12%

Given

Number of S.D. from Mean, (z)	Area of the left or right (one tail)
0.25	0.4013
0.30	0.3821
0.55	0.2912
0.60	0.2743

$$e^{0.12 \times 0.5} = 1.062$$

$$\ln 1.0667 = 0.0646$$

## Answer

### Applying the Black Scholes Formula,

Value of the Call option now:

The Formula  $C = SN(d_1) - Ke^{(-rt)} N(d_2)$

$$d_1 = \frac{\ln(S/K) + (r + \sigma^2 / 2)t}{\sigma\sqrt{t}}$$

$$d_2 = d_1 - \sigma\sqrt{t}$$

Where,

C = Theoretical call premium

S = Current stock price

t = time until option expiration

K = option striking price

r = risk-free interest rate

N = Cumulative standard normal distribution

e = exponential term

$\sigma$  = Standard deviation of continuously compounded annual return.

ln = natural logarithm

$$d_1 = \frac{\ln(1.0667) + (12\% + 0.08)0.5}{0.40\sqrt{0.5}} = \frac{0.0646 + (0.2)0.5}{0.40 \times 0.7071} = \frac{0.1646}{0.2828} = 0.5820$$

$$d_2 = 0.5820 - 0.2828 = 0.2992$$

$$N(d_1) = N(0.5820)$$

$$N(d_2) = N(0.2992)$$

$$\begin{aligned} \text{Price} &= SN(d_1) - Ke^{(-rt)} N(d_2) \\ &= 80 \times N(d_1) - (75/1.062) \times N(d_2) \end{aligned}$$

$$\text{Value of option} = 80 N(d_1) - \frac{75}{1.062} \times N(d_2)$$

$$N(d_1) = N(0.5820) = 0.7197$$

$$N(d_2) = N(0.2992) = 0.6176$$

$$\begin{aligned}
 \text{Price} &= 80 \times 0.7197 - \frac{75}{1.062} \times 0.6176 \\
 &= 57.57 - 70.62 \times 0.6176 \\
 &= 57.57 - 43.61 \\
 &= ₹13.96
 \end{aligned}$$

**Notes:**
**Please note following important point:**

Values of  $N(d_1)$  and  $N(d_2)$  have been computed by interpolating the values of areas under respective numbers of SD from Mean (Z) given in the question.

It may also be possible that in question paper areas under Z may be mentioned otherwise e.g. Cumulative Area or Area under Two tails. In such situation the areas of the respective Zs given in the question will be as follows:

**Cumulative Area**

Number of S.D. from Mean, (z)	Cumulative Area
0.25	0.5987
0.30	0.6179
0.55	0.7088
0.60	0.7257

**Two tail area**

Number of S.D. from Mean, (z)	Cumulative Area
0.25	0.8026
0.30	0.7642
0.55	0.5823
0.60	0.5485

**QUESTION 43**
**BETA MANAGEMENT**

On January 1, 2013 an investor has a portfolio of 5 shares as given below:

Security	Price	No. of Shares	Beta
A	349.30	5,000	1.15
B	480.50	7,000	0.40
C	593.52	8,000	0.90
D	734.70	10,000	0.95
E	824.85	2,000	0.85

The cost of capital to the investor is 10.5% per annum.

You are required to calculate:

- i. The beta of his portfolio.
- ii. The theoretical value of the NIFTY futures for February 2013.
- iii. The number of contracts of NIFTY the investor needs to sell to get a full hedge until February for his portfolio if the current value of NIFTY is 5900 and NIFTY futures have a minimum trade lot requirement of 200 units. Assume that the futures are trading at their fair value.
- iv. The number of future contracts the investor should trade if he desires to reduce the beta of his portfolios to 0.6.

No. of days in a year be treated as 365.

Given:  $\ln(1.105) = 0.0998$  and  $e^{(0.015858)} = 1.01598$

## Answer

### i. Calculation of Portfolio Beta

Security	Price of the Stock	No. of shares	Value	Weightage $w_i$	Beta $B_i$	Weighted Beta
A	349.30	5,000	17,46,500	0.093	1.15	0.107
B	480.50	7,000	33,63,500	0.178	0.40	0.071
C	593.52	8,000	47,48,160	0.252	0.90	0.227
D	734.70	10,000	73,47,000	0.390	0.95	0.370
E	824.85	2,000	16,49,700	0.087	0.85	0.074
			<b>1,88,54,860</b>			<b>0.849</b>

Portfolio Beta = 0.849

### ii. Calculation of Theoretical Value of Future Contract

Cost of Capital = 10.5% p.a. Accordingly, the Continuously Compounded Rate of Interest  $\ln(1.105) = 0.0998$

For February 2013 contract,  $t = 58/365 = 0.1589$

Further  $F = Se^{rt}$

$$F = ₹ 5,900e^{(0.0998)(0.1589)}$$

$$F = ₹ 5,900e^{0.015858}$$

$$F = ₹ 5,900 \times 1.01598 = ₹ 5,994.28$$

Alternatively, it can also be taken as follows:

$$= ₹ 5900 e^{0.105 \times 58/365}$$

$$= ₹ 5900 e^{0.01668}$$

$$= ₹ 5900 \times 1.01682 = ₹ 5,999.24$$

### iii. When total portfolio is to be hedged:

$\frac{\text{Value of Spot Position requiring hedging}}{\text{Value of Future Contract}} \times \text{Portfolio Beta}$

$$= \frac{1,88,54,860}{5994.28 \times 200} \times 0.849 = 13.35 \text{ contracts say 13 or 14 contracts}$$

iv. **When total portfolio beta is to be reduced to 0.6:**

$$\text{Number of Contracts to be sold} = \frac{P(\beta_P - \beta_P)}{F}$$

$$\frac{1,88,54,860 (0.849 - 0.600)}{5994.28 \times 200} = 3.92 \text{ contracts say 4 contracts}$$

**QUESTION 44**
**FUTURE HEDGING**

Nitrogen Ltd, a UK company is in the process of negotiating an order amounting to €4 million with a large German retailer on 6 months credit. If successful, this will be the first time that Nitrogen Ltd has exported goods into the highly competitive German market. The following three alternatives are being considered for managing the transaction risk before the order is finalized.

- i.** Invoice the German firm in Sterling using the current exchange rate to calculate the invoice amount.
- ii.** Alternative of invoicing the German firm in € and using a forward foreign exchange contract to hedge the transaction risk.
- iii.** Invoice the German first in € and use sufficient 6 months sterling future contracts (to the nearly whole number) to hedge the transaction risk.

Following data is available:

Spot Rate	€ 1.1750 - €1.1770/£
6 months forward premium	0.55-0.60 Euro Cents
6 months future contract is currently trading at	€1.1760/£
6 months future contract size is	£62500
Spot rate and 6 months future rate	€1.1785/£

Required:

- a.** Calculate to the nearest £ the receipt for Nitrogen Ltd, under each of the three proposals.
- b.** In your opinion, which alternative would you consider to be the most appropriate and the reason thereof.

## Answer

**i. Receipt under three proposals**

(a) Invoicing in Sterling

$$\text{Invoicing in } \pounds \text{ will produce} = \frac{\pounds 4 \text{ million}}{1.1770} = \pounds 3398471$$

(b) Use of Forward Contract

$$\text{Forward Rate} = \pounds 1.1770 + 0.0055 = 1.1825$$

$$\text{Using Forward Market hedge Sterling receipt would be} = \frac{\pounds 4 \text{ million}}{1.1825} = \pounds 3382664$$

(c) Use of Future Contract

$$\begin{aligned} &\text{The equivalent sterling of the order placed based on future price } (\pounds 1.1760) \\ &= \frac{\pounds 4.00 \text{ million}}{1.1760} = \pounds 3401360 \end{aligned}$$

$$\text{Number of Contracts} = \frac{\pounds 3401360}{62,500} = 54 \text{ Contracts (to the nearest whole number)}$$

$$\text{Thus, } \pounds \text{ amount hedged by future contract will be} = 54 \times \pounds 62,500 = \pounds 3375000$$

$$\text{Buy Future at} \quad \pounds 1.1760$$

$$\text{Sell Future at} \quad \underline{\pounds 1.1785}$$

$$\underline{\pounds 0.0025}$$

$$\text{Total profit on Future Contracts} = 54 \times \pounds 62,500 \times \pounds 0.0025 = \pounds 8438$$

After 6 months

$$\text{Amount Received} \quad \pounds 4000000$$

$$\text{Add: Profit on Future Contracts} \quad \pounds \underline{8438}$$

$$\pounds 4008438$$

Sterling Receipts

$$\text{On sale of } \pounds \text{ at spot} = \frac{\pounds 4008438}{1.1785} = \pounds 3401305$$

**ii. Proposal of option (c) is preferable because the option (a) & (b) produces least receipts.**

**QUESTION 45****COST OF CARRY MODEL AND ARBITRAGE**

The NSE-50 Index futures are traded with rupee value being ₹ 100 per index point. On 15th September, the index closed at 1195, and December futures (last trading day December 15) were trading at 1225. The historical dividend yield on the index has been 3% per annum and the borrowing rate was 9.5% per annum.

- i. Determine whether on September 15, the December futures were underpriced or overpriced?
- ii. What arbitrage transaction is possible to gain out this mispricing?
- iii. Calculate the gains and losses if the index on 15th December closes at (a) 1260 (b) 1175.

Assume 365 days in a year for your calculations.

## Answer

$$\begin{aligned}
 \text{(i) Current price of the December Future} &= ₹ 100 \left[ 1195 + 1195 (0.095 - 0.03) \frac{91}{365} \right] \\
 &= ₹ 100 [1195 + 19.37] \\
 &= ₹ 1,21,437
 \end{aligned}$$

Since the current market price of December-15 is ₹ 1,22,500 (₹ 100 x 1225) it is overpriced.

**(ii)** Since the actual future is overpriced, the cash and carry arbitrage is possible i.e. sell the future contract and borrow to buy the stock.

**(iii)** September 15

Transaction	Cash Flow
Buy (1195 x ₹ 100) = ₹ 1,19,500 worth of Stocks	- ₹ 1,19,500.00
Borrow ₹ 1,19,500 @ 9.50% for 91 days	+ ₹ 1,19,500.00
Sell a Future Contract @ 1225	0
<b>Total</b>	<b>0</b>

**(a) If on December 15, the Index closes at 1260**

Transaction	Cash Flow (₹)
Repay ₹ 1,19,500 @ 9.50% for 91 days	- 1,22,330.35
Cancellation of Future Contract (1,22,500 – 1,26,000)	- 3,500.00
Sell 1,19,500 worth of Stocks @ 1,260	+1,26,000.00
$\left( \frac{1260}{1195} \right) \times 1,19,500$	
Dividend Earned @ 3%	+ 893.79
$\left( \frac{91}{365} \right) \times 1,19,500 \times 3\%$	
<b>Gain due to Arbitrage</b>	<b>+ 1,063.44</b>

(b) If on December 15, the Index closes at 1175

Transaction	Cash Flow (₹)
Repay ₹ 1,19,500 @ 9.50% for 91 days	- 1,22,330.35
Cancellation of Future Contract (1,22,500 – 1,17,500)	+5,000.00
Sell 1,19,500 worth of Stocks @ 1,175 $\left(\frac{1,175}{1,195}\right) \times 1,19,500$	+ 1,17,500.00
Dividend Earned @ 3%	+ 893.79
$\left(\frac{91}{365}\right) \times 1,19,500 \times 3\%$	
Gain due to Arbitrage	+ 1,063.44

## REVISION

# STRATEGIC FINANCIAL MANAGEMENT

## INTEREST RATE RISK MANAGEMENT

### QUESTION 46

#### FRA HEDGING

P Ltd. is contemplating to borrow an amount of ₹ 50 crores for a period of 3 months in the coming 6 months time from now. The current rate of interest is 8% per annum but it may go up in 6 months time. The company wants to hedge itself against the likely increase in interest rate.

The Company's Bankers quoted an FRA (Forward Rate Agreement) at 8.30% per annum.

Compute the effect of FRA and actual rate of interest cost to the company, if the actual rate of interest during consideration period happens to be (i) 8.60% p.a., or (ii) 7.80% p.a.

(Show your workings on the basis of months)

## Answer

Final settlement amount shall be computed by using formula:

$$= \frac{(N)(RR - FR)(dtm / DY)}{[1 + RR(dt m / DY)]}$$

Where,

N = the notional principal amount of the agreement;

RR = Reference Rate for the maturity specified by the contract prevailing on the contract settlement date;

FR = Agreed-upon Forward Rate; and

dtm = maturity of the forward rate, specified in Months

DY = Applicable basis of months

Accordingly,

If actual rate of interest after 6 months happens to be 8.60%

$$= \frac{(\text{₹ } 50 \text{ crore})(0.086 - 0.083)(3/12)}{[1 + 0.086(3/12)]}$$

$$= \frac{(\text{₹ } 50 \text{ crore})(0.003)(0.25)}{1.0215} = \frac{3,75,000}{1.0215} = \text{₹ } 3,67,107$$

Thus, **banker will pay** a sum of ₹ 3,67,107 to P Ltd. and actual interest rate for P Ltd. shall be as follows:

Interest on loan @ 8.60% for 3 months	₹ 1,07,50,000
Less: Amount Received from the bank	₹ 3,67,107
Net Amount	₹ 1,03,82,893
Effective Interest Rate (₹ 1,03,82,893/ ₹ 50 crore x 12/3 x 100)	8.31%

If actual rate of interest after 6 months happens to be 7.80%

$$= \frac{(\text{₹ } 50 \text{ crore})(0.0780 - 0.0830)(3/12)}{[1 + 0.0780(3/12)]}$$

$$= \frac{(\text{₹ } 50 \text{ crore})(-0.005)(0.25)}{1.0195} = \frac{-6,25,000}{1.0195} = -\text{₹ } 6,13,046$$

Thus P Ltd. will pay banker a sum of ₹ 6,13,046 and actual interest rate for P Ltd. shall be as follows:

Interest on loan @7.80% for 3 months	₹ 97,50,000
Add: Amount paid to bank	₹ 6,13,046
Net Amount	₹ 1,03,63,046
Effective Interest Rate (₹ 1,03,63,046/50 crore x 12/3 x 100)	8.29%

## QUESTION 47

### CURRENCY OF BORROWING AND FRA PRICING

An Indian company obtains the following quotes (₹/\$)

Spot:	35.90/36.10
3 - Months forward rate:	36.00/36.0%
6 - Months forward rate:	36.10/36.40

The company needs \$ funds for six months. Determine whether the company should borrow in \$ or ₹ Interest rates are :

3 - Months interest rate : ₹ : 12%, \$ : 6%

6 - Months interest rate : ₹ : 11.50%, \$ : 5.5%

Also determine what should be the rate of interest after 3-months to make the company indifferent between 3-months borrowing and 6-months borrowing in the case of:

- i. Rupee borrowing
- ii. Dollar borrowing

Note: For the purpose of calculation you can take the units of dollar and rupee as 100 each.

## Answer

**i. If company borrows in \$ then outflow would be as follows:**

Let company borrows \$ 100	\$ 100.00
Add: Interest for 6 months @ 5.5%	<u>\$ 2.75</u>
Amount Repayable after 6 months	<u>\$ 102.75</u>
Applicable 6 month forward rate	36.40
Amount of Cash outflow in Indian Rupees	₹ 3,740.10

If company borrows equivalent amount in Indian Rupee, then outflow would be as follows:

Equivalent ₹ amount ₹ 36.10 x 100	₹ 3,610.00
Add: Interest @11.50%	<u>₹ 207.58</u>
	<u>₹ 3817.58</u>

Since cash outflow is more in ₹ borrowing then borrowing should be made in \$.

**ii. a.** Let 'ir' be the interest rate of ₹ borrowing make indifferent between 3 months borrowings and 6 months borrowing then

$$(1 + 0.03) (1 + i_r) = (1 + 0.0575)$$

$$i_r = 2.67\% \text{ or } 10.68\% \text{ (on annualized basis)}$$

**b.** Let 'id' be the interest rate of \$ borrowing after 3 months to make indifference between 3 months borrowings and 6 months borrowings. Then,

$$(1 + 0.015) (1 + i_d) = (1 + 0.0275)$$

$$i_d = 1.232\% \text{ or } 4.93\% \text{ (on annualized basis)}$$

**QUESTION 48****TWO PARTY CURRENCY SWAP – COMPARATIVE ADVANTAGE THEORY**

A Inc. and B Inc. intend to borrow \$200,000 and \$200,000 in ¥ respectively for a time horizon of one year. The prevalent interest rates are as follows:

<b>Company</b>	<b>¥ Loan</b>	<b>\$ Loan</b>
A Inc	5%	9%
B Inc	8%	10%

The prevalent exchange rate is \$1 = ¥120.

They entered in a currency swap under which it is agreed that B Inc will pay A Inc @ 1% over the ¥ Loan interest rate which the later will have to pay as a result of the agreed currency swap whereas A Inc will reimburse interest to B Inc only to the extent of 9%. Keeping the exchange rate invariant, quantify the opportunity gain or loss component of the ultimate outcome, resulting from the designed currency swap.

## Answer

<b>Opportunity gain of A Inc under currency swap</b>	<b>Receipt</b>	<b>Payment</b>	<b>Net</b>
Interest to be remitted to B. Inc in \$ 2,00,000 x 9% = \$18,000 Converted into (\$18,000 x ¥120)		¥21,60,000	
Interest to be received from B. Inc in \$ converted into ¥ (6% x \$2,00,000 x ¥120)	¥14,40,000	-	
Interest payable on ¥ loan	-	¥12,00,000	
	<b>¥14,40,000</b>	<b>¥33,60,000</b>	
Net Payment	¥19,20,000	-	
	<b>¥33,60,000</b>	<b>¥33,60,000</b>	
\$ equivalent paid ¥19,20,000 x(1/¥120)			\$16,000
Interest payable without swap in \$			\$18,000
Opportunity gain in \$			<b>\$ 2,000</b>

<b>Opportunity gain of B Inc under currency swap</b>	<b>Receipt</b>	<b>Payment</b>	<b>Net</b>
Interest to be remitted to A. Inc in (\$ 2,00,000 x 6%)		\$12,000	
Interest to be received from A. Inc in ¥ converted into \$ =¥21,60,000/¥120	\$18,000		
Interest payable on \$ loan@10%	-	\$20,000	
	<b>\$18,000</b>	<b>\$32,000</b>	
Net Payment	\$14,000	-	
	<b>\$32,000</b>	<b>\$32,000</b>	
¥ equivalent paid \$14,000 X ¥120			¥16,80,000
Interest payable without swap in ¥ (\$2,00,000X ¥ 120 X 8%)			¥19,20,000
Opportunity gain in ¥			<b>¥ 2,40,000</b>

**QUESTION 49****FRA PRICING AND IRG**

Two companies ABC Ltd. and XYZ Ltd. approach the DEF Bank for FRA (Forward Rate Agreement). They want to borrow a sum of ₹ 100crores after 2 years for a period of 1 year. Bank has calculated Yield Curve of both companies as follows:

Year	XYZ Ltd.	ABC Ltd.*
1	3.86	4.12
2	4.20	5.48
3	4.48	5.78

\*The difference in yield curve is due to the lower credit rating of ABC Ltd. compared to XYZ Ltd.

- i. You are required to calculate the rate of interest DEF Bank would quote under 2V3 FRA, using the company's yield information as quoted above.
- ii. Suppose bank offers Interest Rate Guarantee for a premium of 0.1% of the amount of loan, you are required to calculate the interest payable by XYZ Ltd. if interest rate in 2 years turns out to be
  - a. 4.50%
  - b. 5.50%

## Answer

i. DEF Bank will fix interest rate for 2V3 FRA after 2 years as follows:

**XYZ Ltd.**

$$\begin{aligned} (1+r) (1+0.0420)^2 &= (1+0.0448)^3 \\ (1+r) (1.0420)^2 &= (1.0448)^3 \\ r &= 5.04\% \end{aligned}$$

Bank will quote 5.04% for a 2V3 FRA.

**ABC Ltd.**

$$\begin{aligned} (1+r) (1+0.0548)^2 &= (1+0.0578)^3 \\ (1+r) (1.0548)^2 &= (1.0578)^3 \\ r &= 6.38\% \end{aligned}$$

Bank will quote 6.38% for a 2V3 FRA.

ii.

		<b>4.50% - Allow to Lapse</b>	<b>5.50%-Exercise</b>
Interest	₹ 100 crores X 4.50%	₹ 4.50 crores	-
	₹ 100 crores X 5.04%	-	₹ 5.04 crores
Premium (Cost of Option)	₹ 100 crores X 0.1%	₹ 0.10 crores	₹ 0.10 crores
		<b>4.60 crores</b>	<b>5.14 crores</b>

# REVISION

# STRATEGIC FINANCIAL MANAGEMENT

## RISK MANAGEMENT

### QUESTION 50

### VAR

Following is the information about Mr. J's portfolio:

Investment in shares of ABC Ltd.	₹ 200 lakh
Investment in shares of XYZ Ltd.	₹ 200 lakh
Daily standard deviation of both shares	1%
Co-efficient of correlation between both shares	0.3

Required:

Determine the 10 days 99% Value At Risk (VAR) for Mr. J' s portfolio. Given : The Z score from the Normal Table at 99% confidence level is 2.33. (Show your calculations up to four decimal points).

## **Answer**

Volatility (standard deviation) of the daily change in the investment in each share in terms of rupees-

1% of ₹ 200 lakh = ₹ 2 lakh

The variance of the portfolio's daily change –

$$V = 2^2 + 2^2 + 2 \times 0.3 \times 2 \times 2 = 10.4 \text{ lakh}$$

Standard Deviation of the portfolio's daily change =  $\sqrt{10.4} = ₹ 3.2249$  lakhs

The standard deviation of the 10-day change

$$= ₹ 3.2249 \text{ lakhs} \times \sqrt{10} = ₹ 10.1981 \text{ lakhs}$$

Therefore, the 10-days 99% VAR =  $2.33 \times ₹ 10.1981 \text{ lakhs} = ₹ 23.7616 \text{ lakhs}$

## QUESTION 51

Neel holds ₹ 1 crore shares of XY Ltd. whose market price standard deviation is 2% per day. Assuming 252 trading days in a year, determine maximum loss level over the period of 1 trading day and 10 trading days with 99% confidence level. Assuming share prices are normally for level of 99%, the equivalent Z score from Normal table of Cumulative Area shall be 2.33.

## **Answer**

Assuming share prices are normally distributed, for level of 99%, the equivalent Z score from Normal table of Cumulative Area is 2.33.

Volatility in terms of rupees is: 2% of ₹ 1 Crore = ₹ 2 lakh

The maximum loss for 1 day at 99% Confidence Level is

₹ 2 lakh x 2.33 = ₹ 4.66 lakh,

and expected maximum loss for 10 trading days shall be:

$\sqrt{10} \times ₹ 4.66 \text{ lakh} = 14.73 \text{ lakhs or } 14.74 \text{ lakhs}$

# REVISION

# STRATEGIC FINANCIAL MANAGEMENT

---

## MISCELLANEOUS QUESTIONS

### QUESTION 52

#### **CORPORATE VALUATION - FCFF APPROACH**

TG Ltd., a multinational company is planning to set up a subsidiary company in India (where hitherto it was exporting) in view of growing demand for its product and competition from other MNCs. The initial project cost (consisting of plant and machinery including installation) is estimated to be US \$ 500 million. The net working capital requirements are estimated at US \$ 100 million. The company follows straight line method of depreciation. Presently, the company is exporting 2 million units every year at a unit price of US \$ 100, its variable cost per unit being US \$ 50.

The Chief Financial Officer has estimated the following operating cost and other data in respect of the proposed project:

- i.** Variable operating cost will be US \$ 25 per unit of production.
- ii.** Additional cash fixed cost will be US \$ 40 million per annum.
- iii.** Production and Sales capacity of the proposed project in India will be 5 million units.
- iv.** Expected useful life of the proposed plant is 5 years with no salvage value.
- v.** Existing working capital investment for production and sale of 2 million units through exports was US \$ 20 million.
- vi.** Export of the product in the coming year will decrease to 1.5 million units in case the company does not open subsidiary company in India, in view of the presence of competing MNCs that are in the process of setting up their subsidiaries in India.
- vii.** Applicable Corporate Income Tax rate is 30%.
- viii.** Required rate of return for such project is 12%.

Assume that there will be no variation in the exchange rate of two countries, all profits will be repatriated and there will be no withholding tax.

Estimate the Net Present Value (NPV) of the proposed project in India.

Present Value Interest Factors (PVIF) @ 12% for 5 years are as under:

<b>Year:</b>	1	2	3	4	5
<b>PVIF:</b>	0.8929	0.7972	0.7118	0.6355	0.5674

(Compute your workings to 4 decimals)

## Answer

Financial Analysis whether to set up the manufacturing units in India or not may be carried using NPV technique as follows:

**i. Incremental Cash Outflows**

	\$ Million
Cost of Plant and Machinery	500.00
Working Capital	100.00
Saving of existing Working Capital employed in Export Business	(20.00)
	580.00

**ii. Incremental Cash Inflow after Tax (CFAT)**

(a) Generated by investment in India for 5 years

	\$ Million
Sales Revenue (5 Million x \$100)	500.00
Less: Costs	
Variable Cost (5 Million x \$25)	125.00
Fixed Cost	40.00
Depreciation (\$500Million/5)	100.00
EBIT	235.00
Taxes@30%	70.50
EAT	164.50
Add: Depreciation	100.00
CFAT (1-5 years)	264.50
Cash flow at the end of the 5 years (Release of Working Capital)	80.00

(b) Cash generation by exports

	\$ Million
Sales Revenue (1.5 Million x \$100)	150.00
Less: Variable Cost (1.5 Million x \$50)	75.00
Contribution before tax	75.00
Tax @ 30%	22.50
CFAT (1-5 years)	52.50

(c) Additional CFAT attributable to Foreign Investment

	\$ Million
Through setting up subsidiary in India	264.50
Through Exports in India	52.50
CFAT (1-5 years)	212.00

iii. **Determination of NPV**

Year	CFAT (\$ Million)	PVF@12%	PV (\$ Million)
1-5	212	3.6048	764.2176
5	80	0.5674	45.3920
			809.6096
Less: Initial Outflow			580.0000
			229.6096

**Decision: Since NPV is positive the proposal should be accepted**

**QUESTION 53****COMMODITY FUTURES HEDGING**

A Rice Trader has planned to sell 22000 kg of Rice after 3 months from now. The spot price of the Rice is ₹ 60 per kg and 3 months future on the same is trading at ₹ 59 per kg. Size of the contract is 1000 kg. The price is expected to fall as low as ₹ 56 per kg, 3 months hence. What the trader can do to mitigate its risk of reduced profit? If he decides to make use of future market, what would be the effective realized price for its sale when after 3 months, spot price is ₹ 57 per kg and future contract price for 3 months is ₹ 58 per kg?

## Answer

In order to hedge its position trader would go short on future at current future price of ₹ 59/kg. This will help the trade to realize sure ₹ 59 per kg. after 3 months.

Particulars	
(a) Quantity of Rice to be hedged	22000 kg.
(b) Contract Size	1000 kg.
(c) No. of Contracts to be sold (a/b)	22
(d) Future Price	₹ 59/kg.
(e) Exposure in the future market (a x d)	₹ 12,98,000

After 3 months, trader would cancel its position in the future by buying a future contract of same quantity and will sell Rice in the spot market and position shall be as follows:

Particulars	₹
(a) Price of Future Contract	58/kg.
(b) Amount bought = 22000 x 58	12,76,000
(c) Gain(Loss) on future position (12,98,000 – 12,76,000)	22,000
(d) Spot Price	57/kg
(e) Amount realized by selling in the spot market (22000 x 57)	12,54,000
(f) Effective Selling Amount (c + e)	12,76,000
(g) Effective Selling Price (12,76,000/22000)	58/kg.

**QUESTION 54**
**CURRENCY OF INVESTMENT**

The Treasury desk of a global bank incorporated in UK wants to invest GBP 200 million on 1st January, 2019 for a period of 6 months and has the following options:

1. The Equity Trading desk in Japan wants to invest the entire GBP 200 million in high dividend yielding Japanese securities that would earn a dividend income of JPY 1,182 million. The dividends are declared and paid on 29th June. Post dividend, the securities are expected to quote at a 2% discount. The desk also plans to earn JPY 10 million on a stock borrow lending activity because of this investment. The securities are to be sold on June 29 with a T+1 settlement and the amount remitted back to the Treasury in London.
2. The Fixed Income desk of US proposed to invest the amount in 6 month G -Secs that provides a return of 5% p.a.

The exchange rates are as follows:

Currency Pair	1-Jan-2019 (Spot)	30-Jun-2019 (Forward)
GBP-JPY	148.0002	50.0000
GBP- USD	1.28000	1.30331

As a treasurer, advise the bank on the best investment option. What would be your decision from a risk perspective. You may ignore taxation.

## Answer

### 1. Yield from Investment in Equity Trading Index in Japan

Conversion of GBP 200 million in JPY (148.0002) JPY 29600.04 Million

Dividend Income	JPY 1182.00 Million
Stock Lending	JPY 10.00 Million
Investment Value at End	JPY 29008.0392 Million
Amount available at End	JPY 30200.0392 Million
Forward Rate of 30.06.2019	JPY 150/ GBP
Amount to be Remitted back to London	GBP 201.3336 Million
Gain = GBP 201.3336 – GBP 200	GBP 1.3336 Million

### 2. Fixed Income Desk of US

Conversion of GBP 200 million in USD (1.28000)	USD 256.00 Million
Add: Interest @ 5% p.a. for 6 months	USD 6.40 Million
Amount available at End	USD 262.40 Million
Forward Rate of 30.06.2019	USD 1.30331/GBP
Amount to be Remitted back to London	GBP 201.3335 Million
Gain = GBP 201.3335 – GBP 200	GBP 1.3335 Million

#### Decision:

The equivalent amount at the end of 6 months shall be almost same in both the options. The bank can go for any of the options.

However, from risk perspective, the investment in fixed income desk of US is more beneficial as the chance of variation in fixed income securities is less as compared to Equity Desk.

**QUESTION 55**

**RIGHTS ISSUE**

AMKO Limited has issued 75,000 equity shares of ₹ 10 each. The current market price per share is ₹ 36. The company has a plan to make a rights issue of one new equity share at a price of ₹ 24 for every four shares held.

You are required to:

- i. Calculate the theoretical post-rights price per share.
- ii. Calculate the theoretical value of the right alone.

## Answer

- i. Calculation of theoretical Post-rights (ex-right) price per share:

$$\text{Ex-right value} = \left[ \frac{MN + SR}{N + R} \right]$$

Where,

M = Market price,

N = Number of old shares for a right share

S = Subscription price

R = Right share offer

$$= \left[ \frac{\text{₹ } 36 \times 4 + \text{₹ } 24 \times 1}{4 + 1} \right] = \text{₹ } 33.60$$

- ii. Calculation of theoretical value of the rights alone:

= Ex-right price – Cost of rights share

= ₹ 33.60 – ₹ 24 = ₹ 9.60

Or

$$= \frac{\text{₹ } 33.60 - \text{₹ } 24}{4} = \text{₹ } 2.40$$

**QUESTION 56**
**CROSS RATE**

An importer customer of your bank wishes to book a forward contract with your bank on 3<sup>rd</sup> September for sale to him of SGD 5,00,000 to be delivered on 30<sup>th</sup> October.

The spot rates on 3<sup>rd</sup> September are USD 49.3700/3800 and USD/SGD 1.7058/68. The swap points are:

USD /₹		USD/SGD	
Spot/September	0300/0400	1 <sup>st</sup> month forward	48/49
Spot/October	1100/1300	2 <sup>nd</sup> month forward	96/97
Spot/November	1900/2200	3 <sup>rd</sup> month forward	138/140
Spot/December	2700/3100		
Spot/January	3500/4000		

Calculate the rate to be quoted to the importer by assuming an exchange margin of paisa.

## Answer

USD/₹ on 3 <sup>rd</sup> September	49.3800
Swap Point for October	0.1300
	<b>49.5100</b>
Add: Exchange Margin	0.0500
	<b>49.5600</b>
USD/SGD on 3 <sup>rd</sup> September	1.7058
Swap Point for 2 <sup>nd</sup> month Forward	0.0096
	<b>1.7154</b>

### Cross Rate for SGD/₹ of 30<sup>th</sup> October

USD/₹ selling rate	= ₹ 49.5600
SGD/₹ buying rate	= SGD 1.7154
SGD/₹ cross rate	= ₹ 49.5600 / 1.7154 = ₹ 28.8912

**QUESTION 57****CALCULATION OF EPS**

Eager Ltd. has a market capitalization of ₹ 1,500 crores and the current market price of its share is ₹ 1,500. It made a PAT of 200 crores and the Board is considering a proposal to buy back 20% of the shares at a premium of 10% to the current market price. It plans to fund this through a 16% bank loan. You are required to calculate the post buy back Earnings Per Share (EPS). The company's corporate tax rate is 30%.

## Answer

Existing No. of Equity Shares

$$= \frac{\text{₹ } 1500 \text{ crore}}{\text{₹ } 1,500} = 1 \text{ Crore}$$

No. of shares to be bought back = 1 Crore x 0.20 = 20 Lakh

Price at which share to be bought back = ₹ 1,500 + 10% of ₹ 1,500 = ₹ 1,650

Amount required for Buyback of Shares = ₹ 1,650 x 20 Lakh = ₹ 330 Crore

Amount of Loan @ 16% = ₹ 330 Crore

Statement showing Post Buyback EPS

Profit before tax (₹ 200 crore/ 0.70)	₹ 285.7143 crore
Less: Interest on Loan (₹ 330 Crore x 16%)	₹ 52.8000 crore
Profit before Tax	₹ 232.9143 crore
Tax	₹ 69.8743 crore
Profit after Tax (PAT)	₹ 163.0400 crore
No. of Shares Post buyback	80 Lakh
EPS (Post Buyback) (₹ 163.0400 Crore/80.00 Lakh)	₹ 203.80

**QUESTION 58**
**CAPITAL STRUCTURE**

Following information is available of M/s. TS Ltd.

	(₹ in crores)
PBIT	5.00
Less : Interest on Debt (10%)	1.00
PBT	4.00
Less: Tax @ 25%	1.00
PAT	3.00
No. of outstanding shares of ₹ 10 each	40 lakh
EPS (₹)	7.5
Market price of share (₹)	75
P/E ratio	10 Times

TS Ltd. has an undistributed reserves of ₹ 8 crores. The company requires ₹ 3 crores for the purpose of expansion which is expected to earn the same rate of return on capital employed as present. However, if the debt to capital employed ratio is higher than 35%, then P/E ratio is expected to decline to 8 Times and rise in the cost of additional debt to 14%. Given this data which of the following options the company would prefer, and why?

**Option (i)** : If the required amount is raised through debt, and

**Option (ii)** : If the required amount is raised through equity and the new shares will be issued at a price of ₹ 25 each.

## Answer

### Working Notes

**1. Calculation of Return on Capital Employed (ROCE)**

	(₹ in crores)
Capital Employed:	
Share Capital (₹ 10 x 40 lakhs)	4
Reserves	8
Debt (₹ 1 cr. x 100/10)	10
	22
PBIT	5
ROCE	22.73%

**2. Revised PBIT**

Existing Capital Employed	22
Additional	3
ROI	22.73%
Revised PBIT	5.6825

**3. New Debt/Equity**

Existing Debt	10
Additional Under Option (i)	3
Total Debt	13
Total Equity	12

$$\text{New Debt to Capital Employed Ratio} = \frac{13}{25} = 0.52$$

So, P/E Ratio to be reduced to 8 times

**4. Debt to Capital Employed Ratio in Option (ii)**

$$= \frac{10}{25} = 0.40$$

So, P/E Ratio to be reduced to 8 times in this case also

5. Number of additional shares to be issued in case of Option (ii)

Funds to be raised ₹ 3 crore

Price per share ₹ 25

No. of additional shares to be issued ₹ 3 crore / ₹ 25 = 12 lakhs

Particulars	Option (i)	Option (ii)
PBIT (Revised) (₹ Crore)	5.6825	5.6825
Less: Interest on Debt	1.42	1.00
PBT (₹ Crore)	4.2625	4.6825
Tax @ 25% (₹ Crore)	1.0656	1.1706
PAT (₹ Crore)	3.1969	3.5119
No. of shares outstanding	40 lakhs	52 lakhs
EPS	₹ 7.99	₹ 6.75
P/E Ratio	8	8
New Share Price	₹ 63.92	₹ 54.00

**Decision:**

Since the MPS is expected to be more in the case of additional financing done through debt (Option – I) Option – I is preferred.