



PAPER – 2

ADVANCED FINANCIAL MANAGEMENT



QUESTIONS

Securitization

1. Grow More Ltd. an NBFC is in the need of funds and hence it sold its receivables to MAC Financial Corporation (MFC) for ₹ 100 million. MFC created a trust for this purpose called General Investment Trust (GIT) through which it issued securities carrying a different level of risk and return to the investors. Further, this structure also permits the GIT to reinvest surplus funds for short term as per their requirement.

MFC also appointed a third party, Safeguard Pvt. Ltd. (SPL) to collect the payment due from obligor(s) and passes it to GIT. It will also follow up with defaulting obligor and if required initiate appropriate legal action against them.

Based on above scenario, answer the following questions:

- I. The securitized instrument issued for ₹ 100 million by the GIT falls under category of
 - (a) Pass Through certificate (PTCs)
 - (b) Pay Through Security (PTS)
 - (c) Stripped Security
 - (d) Debt Fund.
- II. In the above scenario, the Originator is.....
 - (a) Grow More Ltd.
 - (b) MAC Financial Corporation (MFC)

- (c) General Investment Trust (GIT)
- (d) Safeguard Pvt. Ltd.
- III. In the above scenario, the General Investment Trust (GIT) is a/an.....
 - (a) Obligor
 - (b) Originator
 - (c) Special Purpose Vehicle (SPV)
 - (d) Receiving and Paying Agent (RPA)
- IV. In the above scenario, the Safeguard Pvt. Ltd. (SPL) is a/an.....
 - (a) Obligor
 - (b) Originator
 - (c) Special Purpose Vehicle (SPV)
 - (d) Receiving and Paying Agent (RPA)
- V. Which of the following statement holds true?
 - (a) When Yield to Maturity in market rises, prices of Principle Only (PO) Securities tend to rise.
 - (b) When Yield to Maturity in market rises, prices of Principle Only (PO) Securities tend to fall.
 - (c) When Yield to Maturity in market falls, prices of Principle Only (PO) Securities tend to fall.
 - (d) When Yield to Maturity in market falls, prices of Principle Only (PO) Securities remain the same.

Security Analysis

2. You are a financial analyst at a prominent investment firm and have been tasked with empirically verifying the weak form of Efficient Market Hypothesis (EMH) Theory for the XYZ Stock Index, a collection of diverse stocks. You decided to conduct three different tests to assess whether the stock market follows the principles of the weak form of EMH.

Test 1

For the past five years, you collected daily price changes of the stocks in the XYZ Stock Index. You calculated correlation coefficients for different lag periods and analyzed whether past price changes exhibit any significant correlation with future price changes. You considered price changes to be serially independent. The results indicated that most auto correlation coefficients are close to zero and statistically insignificant, suggesting those past price changes do not predict future price changes.

Test 2

You further investigated the randomness of price changes in the XYZ Stock Index. Analyzing the sequence of daily price changes, you count the number of runs where price changes are consistently positive or negative. Upon comparing the observed number of runs with the expected number based on randomness, you find that they align closely, supporting the idea that price changes follow a random pattern.

Test 3

To examine the efficacy of trading strategies based on historical price trends, you implemented a simple trading rule for the XYZ Stock Index. The rule involves buying when the price crosses a moving average of 5% threshold and selling when it crosses another 7% threshold. Over a period of testing, you computed the returns generated by the trading strategy. The results revealed that the returns are not consistently better than random chance, implying that past price trends do not reliably predict future price movements.

Conclusion:

After conducting the three tests the evidence supports the weak form of Efficient Market Theory for the XYZ Stock Index you concluded that past price trends do not reliably predict future price movements.

Based on the above information answer the following questions:

- I. Test 1 is
 - (a) Serial Correlation test
 - (b) Filter Rules test

- (c) Run test
- (d) Variance Ratio test
- II. Test 2 is
 - (a) Serial Correlation test
 - (b) Filter Rules test
 - (c) Run test
 - (d) Variance Ratio test
- III. Test 3 is
 - (a) Serial Correlation test
 - (b) Filter Rules test
 - (c) Run test
 - (d) Variance Ratio test.
- IV. The Filter Rule Test should not be applied for buy and hold strategy if.....
 - (a) the behavior of stock price changes is predictable.
 - (b) the behavior of stock price changes is dependent on past trends.
 - (c) the behavior of stock price changes is correlated.
 - (d) the behavior of stock price changes is random.
- V. Results of your studies support the.....
 - (a) Semi-strong EMH Theory
 - (b) Strong EMH Theory
 - (c) Random Walk Theory
 - (d) Markowitz Theory

Derivatives Analysis and Valuation

3. Mr. Shyam an investor is not sure about the expected price movement of the stock of Delta Corporation's share. His friend Adi advised him to go for option contracts if he wants to play in the market with limited risk. Adi

advised him to follow below mentioned Strategy.

- (1) Purchase one 3-month call option with a premium of ₹ 30 and an exercise price of ₹ 550.
- (2) Purchase one 3-month put option with a premium of ₹ 5 and an exercise price of ₹ 450.

Delta Corporation's stock is currently selling at ₹ 500.

Demonstrate the net pay off position of Mr. Shyam at the expiry of option after 3-months if the price of Delta Corporation's stock happens to be:

- (i) No change in price
- (ii) falls at ₹ 350
- (iii) rises to ₹ 600.

Assume the option lot size is 100.

4. The price of ACC stock on 31 December 2022 was ₹ 220 and the Futures price on the same stock on the same date, i.e., 31 December 2022 for March 2023 was ₹ 222. Other features of the Futures contract and related information are as follows:

Time to expiration	-	3 months (0.25 year)
Borrowing rate	-	15% p.a.
Annual Dividend on the stock	-	25% payable before 31.03. 2023
Face Value of the Stock	-	₹ 10

Advise the investor the course of action to be followed by him so as to earn Risk free income if he can sell the stock short at spot price.

Business Valuation

5. The following information is given for 3 companies that are identical except for their capital structure:

	Orange	Grape	Apple
Total invested capital	1,00,000	1,00,000	1,00,000
Debt/assets ratio	0.8	0.5	0.2
Pre-tax cost of debt	16%	13%	15%

Cost of equity	26%	22%	20%
Operating Income (EBIT)	25,000	25,000	25,000

The tax rate is uniform 35% in all cases.

Required:

- (i) Compute the Weighted Average Cost of Capital of each company.
- (ii) Tabulate the Economic Valued Added (EVA) of each company.
- (iii) If the industry PE ratio is 11x and stock prices of Orange, Grape and Apple are ₹ 14.30, ₹ 15.95 and ₹ 15.73 respectively then calculate the no. of shares issued by each company.
- (iv) Advise whether same Industry PE ratio can be used to calculate market price of share of each company.
- (v) Tabulate market Capitalisation for each of the Companies.

Foreign Exchange Exposure and Risk Management

6. JKL Ltd., an Indian company has an export exposure of JPY 10,000,000 receivable December 31, 2022. Japanese Yen (JPY) is not directly quoted against Indian Rupee.

The current spot rates are:

INR/US \$ = ₹ 82.22

JPY/US\$ = JPY 132.34

It is estimated that Japanese Yen will depreciate to 154 against US \$ and Indian Rupee to depreciate to ₹ 85 against US \$.

Forward rates as on date for 31st December 2022 are as follows:

INR/US \$ = ₹ 86.50

JPY/US\$ = JPY 140.35

Required:

- (i) Evaluate the expected loss based on estimated rates if the hedging is not done.
- (ii) Justify the decision to take forward cover even if actual rates on December 31, 2022 happens to be as follows:

INR/US \$ = ₹ 86.25

JPY/US\$ = JPY 140.85

Note: Make calculation of ₹ rate in ₹ upto 4 decimal points.

7. A UK based exporter exported goods to USA. The Invoice amount is \$ 7,00,000 and credit period is 3 months. Exchange rates in London are as follows: -

Spot Rate (\$/£) 1.5865 – 1.5905

3-month Forward Rate (\$/£) 1.6100 – 1.6140

Rates of interest in Money Market:

	Deposit	Loan
\$	7%	9%
£	5%	8%

Justify your stand to choose money market hedge (including steps) instead of Forward Contract.

Note: Make calculation upto 2 decimal points.

Advanced Capital Budgeting Decisions

8. X Ltd. is considering its new project with the following details:

Sr. No.	Particulars	Figures
1.	Initial capital cost	₹ 400 Cr.
2.	Annual unit sales	5 Cr.
3.	Selling price per unit	₹ 100
4.	Variable cost per unit	₹ 50
5.	Fixed costs per year	₹ 50 Cr.
6.	Discount Rate	6%

Required:

- (i) Tabulate the NPV of the project. Does it represent the actual outcome? Comment.

- (ii) Examine the impact of 2.5 percent adverse variance in each of the variables on the project's NPV. Decide which variable is having maximum effect?
- (iii) Critically analyse the Sensitivity analysis as method of incorporating risk in capital budgeting decisions.

Consider Life of the project as 3 years.

Interest Rate Risk Management

9. 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:

Company	₹ Loan	\$ Loan
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, assess and analyse the opportunity gain or loss component of the ultimate outcome, resulting from the designed currency swap.

Mutual Fund

10. There are two Mutual Funds viz. D Mutual Fund Ltd. and K Mutual Fund Ltd. Each having close ended equity schemes.

NAV as on 31-12-2022 of equity schemes of D Mutual Fund Ltd. is ₹ 70.71 (consisting 99% equity and remaining cash balance) and that of K Mutual Fund Ltd. is ₹ 62.50 (consisting 96% equity and balance in cash).

Following is the other information:

Particular	Equity Schemes	
	D Mutual Fund Ltd.	K Mutual Fund Ltd.
Sharpe Ratio	2	3.3
Treynor Ratio	15	15
Standard deviation	11.25	5
Risk free rate of return (R_f)	7%	

There is no change in portfolios during the next month and annual average cost is ₹ 3 per unit for the schemes of both the Mutual Funds.

Required:

- Tabulate the expected NAVs of both the schemes if share market goes down by 5% within a month.
- Advise which mutual fund should an investor choose from the perspective of risk per unit of return.

Note: For calculation purpose, consider 12 months in a year and ignore number of days for a particular month.

Portfolio Management

- An investor has decided to invest ₹ 1,00,000 in the shares of two companies, namely, ABC and XYZ. The projections of returns from the shares of the two companies along with their probabilities are as follows:

Probability	ABC (%)	XYZ (%)
0.20	12	16
0.25	14	10
0.25	-7	28
0.30	28	-2

Required:

- Comment on return and risk of investment in individual shares.
- Compare the risk and return of these two shares with a Portfolio of these shares in equal proportions.

- (iii) Advise the proportion of each of the above shares to formulate a minimum risk portfolio.

Security Valuation

12. Mr. Amit is happy with the investment in a company as it is paying good dividend for the last few years. Last year it paid a dividend of ₹ 2 per share. The share is currently trading at ₹ 150 per share. He is of view that if he applies dividend discount model, the share is undervalued. As a financial expert examine his view that dividend discount model represents the fair value.

You being an expert is required to evaluate the market value of the share of the company.

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

Note: Round off figures (e.g. EPS etc.) upto 2 decimal points.

International Financial management

13. Mr. Vishwas, a friend of Mr. Pramod who is one of the Directors of Ashirwad Limited, is a citizen of Mauritius. His immediate family members including his parents, born in India are residing in India. He has many friends in different parts of India, due to which he happens to visit India on frequent basis. He along with Mr. Pramod evince interest in setting up business in India and formally incorporate a company to commence their operations. Accordingly, a company is called "Aerious Private Ltd." got incorporated in Mumbai.

To start with he received a business proposal from one of his friends Nimish a consultant. It is estimated that in equivalent terms the business shall require an initial investment of MUR 100 Million and thereafter MUR 2 Million each year will be needed as working capital fund.

He wished to evaluate whether the business proposal is viable or not. The information related to exchange rate and inflation rate is as follows:

Spot Rate for 1 Mauritian Dollar (MUR) = 1.88 Indian Rupee (INR)

The inflation in India is 6% and in Mauritius is 5%.

It is expected that this inflation rate will remain unchanged for the next 4 years.

INR 8 Crore out of initial investment shall be required for setting up a plant. The useful life of the plant is 4 years. At the end of 4th year estimated salvage value of this plant shall be INR 80 lakhs. Depreciation of the plant shall be charged on the basis of straight-line method.

40 % of the investment shall be through debt funds from Mauritius at the cost of 10% (post tax) while remaining funds shall be arranged by him and his friends. They expect a rate of return of 12% on their funds.

Expected revenues & costs (excluding depreciation) in real term are as under:

Year	1	2	3	4
Revenues (₹ Crore)	6.00	7.00	8.00	8.00
Costs (₹ Crore)	3.00	4.00	4.00	4.00

Assume that applicable tax rate in India is 30%. Since there is Double tax avoidance agreement between India and Mauritius, the company is not required to pay tax in Mauritius if tax has been paid in India.

The applicable inflation rates for revenues & costs are as follows:

Year	Revenues	Costs
1	10%	12%
2	9%	10%
3	8%	9%
4	7%	8%

He wants an expert opinion for the same investment proposal.

Demonstrate whether investment in this project is viable option or not.

- Note:** 1. Round off calculations upto 4 decimal points.
2. Show INR calculations in Crore and MUR calculations in Million.

Theoretical Questions

14. Succession planning is a good way for companies to ensure that businesses are fully prepared to promote and advance all employees—not just those who are at the management or executive levels. Explain the above statement.
15. In the current scenario of globalization and growth in information and communication technologies etc. the responsibilities of CFOs have been drastically expanded. Explain.



SUGGESTED ANSWERS/HINTS

1.

I	(b)
II	(b)
III	(c)
IV	(d)
V	(b)

2.

I	(a)
II	(c)
III	(b)
IV	(d)
V	(c)

3. Total premium paid on purchasing a call and put option
= (₹ 30 per share × 100) + (₹ 5 per share × 100)
= ₹ 3,000 + ₹ 500 = ₹ 3,500

- (i) Net Pay-off if there is no change in price

In this case, Mr. Shyam exercises neither the Call option nor the Put option as both will result in a loss for him.

Ending value = - ₹ 3,500 + Zero gain = - ₹ 3,500

i.e. Net loss is ₹ 3,500

- (ii) Net Pay-off if price falls at ₹ 350

Since the price of the stock is below the exercise price of the Call, it will not be exercised. Only Put is valuable hence it is exercised.

Ending value = - ₹ 3,500 + ₹ [(450 - 350) × 100] = - ₹ 3,500 + ₹ 10,000 = ₹ 6,500

∴ Net gain is ₹ 6,500

- (iii) Net Pay-off if price rises to ₹ 600

In this situation, the put is worthless since the price of the stock exceeds the Put's exercise price. Only Call is valuable and hence it is exercised.

Ending value = - ₹ 3,500 + ₹ [(600 - 550) × 100] = - ₹ 3,500 + ₹ 5,000 = ₹ 1,500

∴ Net Gain is ₹ 1,500

4. Based on the above information, the futures price for ACC stock on 31 December 2022 should be:

Spot price + Interest Portion – Dividend

$$= 220 + (220 \times 0.15 \times 0.25) - (0.25 \times 10) = 225.75$$

Thus, as per the 'cost of carry' criteria, the Futures price is ₹ 225.75, which is more than the actual price of ₹ 222 on 31 March 2023. This would give rise to earn riskless arbitrage opportunity of ₹ 3.75 i.e. (225.75 - 222)

Advise to the Arbitrager.

1. Short sell one unit of stock at spot price for ₹ 220.
2. Deposit ₹ 220 at 15% p.a. for 3 months.
3. Buy a 3-month Futures contract for one unit of stock of ACC at ₹ 222.

After 3 months

1. Take money out of the Bank.
2. Take delivery by paying ₹ 222 and return the unit of stock to the party whom short sell was made along.
3. Pay the Dividend amount to the buyer whom short sell was made.

$$\text{Total Inflow} = 220 + (220 \times 0.15 \times 0.25) = ₹ 228.25$$

$$\text{Total Outflow} = 222 + 2.50 = ₹ 224.50$$

$$\text{Net Gain to the Arbitrager} = \text{Total Inflow} - \text{Total Outflow}$$

$$= ₹ 228.25 - ₹ 224.50$$

$$= ₹ 3.75$$

Thus, the arbitrager earns ₹ 3.75 per share without involving any risk.

5. (i) Calculation of WACC of each company

	Orange	Grape	Apple
Total debt (₹)	80,000	50,000	20,000
Post tax Cost of debt	10.40%	8.45%	9.75%
Equity Fund (₹)	20,000	50,000	80,000

WACC

$$\text{Orange:} \quad (10.4 \times 0.8) + (26 \times 0.2) = 13.52\%$$

$$\text{Grape:} \quad (8.45 \times 0.5) + (22 \times 0.5) = 15.225\%$$

$$\text{Apple:} \quad (9.75 \times 0.2) + (20 \times 0.8) = 17.95\%$$

(ii) Economic Valued Added (EVA) of each company

	Orange	Grape	Apple
WACC	13.52	15.225	17.95
EBIT (1-T) (A)	16,250	16,250	16,250
WACC x Invested Capital (B)	13,520	15,225	17,950
EVA [(A) – (B)]	2,730	1,025	-1,700

Orange would be considered as the best investment since the EVA of the company is highest and its weighted average cost of capital is the lowest.

(iii) No. of shares issued by each company

	Orange	Grape	Apple
EBIT (₹)	25,000	25,000	25,000
Interest (₹)	12,800	6,500	3,000
Taxable Income (₹)	12,200	18,500	22,000
Tax 35% (₹)	4,270	6,475	7,700
Net Income (₹)	7,930	12,025	14,300
Stock Price (EPS x PE Ratio) (₹)	14.30	15.95	15.73
No. of shares	(7930x11)/ 14.30 = 6100	(12025x11)/1 5.95 = 8293	(14300x11)/1 5.73 = 10000

(iv) Since the three entities have different capital structures, they would be exposed to different degrees of financial risk. The PE ratio should therefore be adjusted for the risk factor.

(v) Market Capitalisation

	Orange	Grape	Apple
Estimated Stock Price (₹)	14.30	15.95	15.73
No. of shares	6,100	8,293	10,000
Estimated Market Cap (₹)	87,230	1,32,273.35	1,57,300

- 6.** Since the direct quote for ¥ and ₹ is not available it will be calculated by cross exchange rate as follows:

$$\text{₹}/\$ \times \$/\text{¥} = \text{₹}/\text{¥}$$

$$82.22/132.34 = 0.6213$$

$$\text{Spot rate on date of export } 1 \text{ ¥} = \text{₹ } 0.6213$$

$$\text{Estimated Rate of ¥ for Dec.31, 2022} = \text{₹ } 0.5519 (\text{₹ } 85/\text{¥ } 154)$$

Forward Rate of ₹ for Dec.31, 2022 = ₹ 0.6163 (₹ 86.50/ ¥ 140.35)

(i) The expected loss without hedging

Value of export at the time of export (₹ 0.6213 x ¥ 10,000,000)	₹ 62,13,000
Expected payment to be received on 31 st Dec. 2022 as per estimated rates (₹ 0.5519 x ¥ 10,000,000)	₹ 55,19,000
Loss	₹ 6,94,000

(ii) (a) Hedging of loss under Forward Cover

Value of export at the time of export (₹ 0.6213 x ¥ 10,000,000)	₹ 62,13,000
Payment expected to be received under Forward Cover (₹ 0.6163 x ¥ 10,000,000)	₹ 61,63,000
Loss	₹ 50,000

Thus, by taking forward cover loss is reduced to ₹ 50,000 from ₹ 6,94,000

(b) Actual Rate of ₹ on December 2022 = ₹ 0.6124 (₹ 86.25/ ¥ 140.85)

Value of export at the time of export (₹ 0.6213 x ¥ 10,000,000)	₹ 62,13,000
Payment to be received on 31 st Dec. 2022 as per actual rate (₹ 0.6124 x ¥ 10,000,000)	₹ 61,24,000
Loss	₹ 89,000

From the above solution, we can find that net loss in actual situation is ₹ 89,000 while net loss when taken Forward Cover is only ₹ 50,000. Hence, the decision to take Forward Cover is justified even if the actual rate happens to be as prescribed.

7. Amount expected to be received under Money Market Hedge.

Identify: Foreign currency is an asset. Amount \$ 7,00,000.

Create: \$ Liability.

Borrow: In \$. The borrowing rate is 9% per annum or 2.25% per quarter.

Amount to be borrowed: $7,00,000 / 1.0225 = \$ 6,84,596.58$

Convert: Sell \$ and buy £. The relevant rate is the Ask rate, namely, 1.5905 per £,

(**Note:** This is an indirect quote).

Amount of £s received on conversion is 4,30,428.53 ($6,84,596.58 / 1.5905$).

Invest: £ 4,30,428.53 will be invested at 5% for 3 months and get £ 4,35,808.89

Settle: The liability of \$ 6,84,596.58 at interest of 2.25 per cent quarter matures to \$7,00,000 receivable from customer.

Using forward rate, amount receivable is $= 7,00,000 / 1.6140 = £ 4,33,705.08$

Amount received through money market hedge = £ 4,35,808.89

Gain = £ 4,35,808.89 – £ 4,33,705.08 = £ 2103.81

Justification: By following the prescribed steps under hedging we found the exporter receives £ 4,33,705.08 by using forward cover while he receives £ 4,35,808.89 through money market hedge. Thus, money market hedge helps exporter to receive £ 2103.81 more than the amount received using Forward contract. Hence it is more beneficial.

8. (i) Calculation of Net Cash Inflow per year

	Particulars	Amount (₹)
A	Selling price per unit	100
B	Variable cost per unit	50
C	Contribution per unit (A - B)	50
D	Number of units sold per year	5 Cr.
E	Total Contribution (C × D)	₹ 250 Cr.
F	Fixed cost per year	₹ 50 Cr.
G	Net cash inflow per year (E - F)	₹ 200 Cr.

Calculation of Net Present Value (NPV) of the Project

Year	Year Cash Flow (₹ in Cr.)	PV factor @ 6%	Present Value (PV) (₹ in Cr.)
0	(400.00)	1.000	(400.00)
1	200.00	0.943	188.60
2	200.00	0.890	178.00
3	200.00	0.840	168.00
Net Present Value			134.60

Here, NPV represent the most likely outcomes and not the actual outcomes. The actual outcome can be lower or higher than the expected outcome.

- (ii) Sensitivity Analysis considering 2.5 % Adverse Variance in each variable

	Particulars	Base	Initial capital cost increased to ₹ 410 crore	Selling Price per Unit Reduced to ₹ 97.5	Variable Cost Per Unit increased to ₹ 51.25	Fixed Cost Per Unit increased to ₹ 51.25	Units sold per year reduced to 4.875 crore
		(₹)	(₹)	(₹)	(₹)	(₹)	(₹)
A	Selling price per unit	100	100	97.50	100	100	100
B	Variable cost per unit	50	50	50	51.25	50	50
C	Contribution per unit (A - B)	50	50	47.50	48.75	50	50
		(₹ in Cr.)	(₹ in Cr.)	(₹ in Cr.)	(₹ in Cr.)	(₹ in Cr.)	(₹ in Cr.)
D	Number of units sold per year (units in Crores)	5	5	5	5	5	4.875
E	Total	250	250	237.50	243.75	250	243.75

	Contribution (C × D)						
F	Fixed cost per year	50	50	50	50	51.25	50
G	Net Cash Inflow per year (E - F)	200	200	187.50	193.75	198.75	193.75
H	PV of Net cash Inflow per year (G × 2.673)	534.60	534.60	501.19	517.89	531.26	517.89
I	Initial capital cost	400	410	400	400	400	400
J	NPV (H - I)	134.60	124.60	101.19	117.89	131.26	117.89
K	Percentage Change in NPV	-	-7.43%	-24.82%	-12.41%	-2.48%	-12.41%

The above table shows that by changing one variable at a time by 2.5% (adverse) while keeping the others constant, the impact in percentage terms on the NPV of the project can be calculated. Thus, the change in selling price has the maximum effect on the NPV by 24.82%.

Advantages of Sensitivity Analysis:

Following are the main advantages of Sensitivity Analysis:

- (1) **Critical Issues:** This analysis identifies critical factors that impinge on a project's success or failure.
- (2) **Simplicity:** It is a simple technique.

Disadvantage of Sensitivity Analysis

Following are the main disadvantages of Sensitivity Analysis:

- (1) **Assumption of Independence:** This analysis assumes that all variables are independent i.e. they are not related to each other, which is unlikely in real life.

- (2) **Ignore probability:** This analysis does not look to the probability of changes in the variables

9. Opportunity gain of A Inc under currency swap

	Receipt	Payment	Net
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	
	₹14,40,000	₹33,60,000	
Net Payment	₹19,20,000	-	
	₹33,60,000	₹33,60,000	
\$ equivalent paid ₹19,20,000 x (1/₹120)			\$16,000
Interest payable without swap in \$			\$18,000
Opportunity gain in \$			\$ 2,000

Opportunity gain of B inc under currency swap

	Receipt	Payment	Net
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	
	\$18,000	\$32,000	
Net Payment	\$14,000	-	
	\$32,000	\$32,000	

¥ equivalent paid \$14,000 X ¥120			¥16,80,000
Interest payable without swap in ¥ (\$2,00,000 X ¥ 120 X 8%)			<u>¥19,20,000</u>
Opportunity gain in ¥			<u>¥ 2,40,000</u>

Alternative Solution
Cash Flows of A Inc
(i) At the time of exchange of principal amount

Transactions		Cash Flows
Borrowings	\$2,00,000 X ¥120	+ ¥240,00,000
Swap		- ¥240,00,000
Swap		<u>+\$2,00,000</u>
Net Amount		<u>+\$2,00,000</u>

(ii) At the time of exchange of interest amount

Transactions		Cash Flows
Interest to the lender	¥240,00,000 X 5%	¥12,00,000
Interest Receipt from B Inc.	¥2,00,000 X 120 X 6%	¥14,40,000
Net Saving (in \$)	¥2,40,000/¥120	\$2,000
Interest to B Inc.	\$2,00,000 X 9%	<u>-\$18,000</u>
Net Interest Cost		<u>-\$16,000</u>

A Inc. used \$2,00,000 at the net cost of borrowing of \$16,000 i.e., 8%. If it had not opted for swap agreement the borrowing cost would have been 9%. Thus, there is saving of 1%.

Cash Flows of B Inc
(i) At the time of exchange of principal amount

Transactions		Cash Flows
Borrowings		+ \$2,00,000
Swap		- \$2,00,000

Swap	\$2,00,000 X ¥120	<u>+¥240,00,000</u>
Net Amount		<u>+¥240,00,000</u>

(ii) At the time of exchange of interest amount

Transactions		Cash Flows
Interest to the lender	\$2,00,000X10%	- \$20,000
Interest Receipt from A Inc.		+\$18,000
Net Saving (in ¥)	-\$2,000X¥120	- ¥2,40,000
Interest to A Inc.	\$2,00,000X6%X¥120	- ¥14,40,000
Net Interest Cost		- ¥16,80,000

B Inc. used ¥240,00,000 at the net cost of borrowing of ¥16,80,000 i.e. 7%. If it had not opted for swap agreement the borrowing cost would have been 8%. Thus, there is saving of 1%.

10. Working Notes:

(I) Decomposition of Funds in Equity and Cash Components

	D Mutual Fund Ltd.	K Mutual Fund Ltd.
NAV on 31.12.14	₹ 70.71	₹ 62.50
% of Equity	99%	96%
Equity element in NAV	₹ 70	₹ 60
Cash element in NAV	₹ 0.71	₹ 2.50

(II) Calculation of Beta

(a) D Mutual Fund Ltd.

$$\text{Sharpe Ratio} = 2 = \frac{E(R) - R_f}{\sigma_D} = \frac{E(R) - R_f}{11.25}$$

$$E(R) - R_f = 22.50$$

$$\text{Treynor Ratio} = 15 = \frac{E(R) - R_f}{\beta_D} = \frac{22.50}{\beta_D}$$

$$\beta_D = 22.50/15 = 1.50$$

(b) K Mutual Fund Ltd.

$$\text{Sharpe Ratio} = 3.3 = \frac{E(R) - R_f}{\sigma_K} = \frac{E(R) - R_f}{5}$$

$$E(R) - R_f = 16.50$$

$$\text{Treynor Ratio} = 15 = \frac{E(R) - R_f}{\beta_K} = \frac{16.50}{\beta_K}$$

$$\beta_K = 16.50/15 = 1.10$$

(III) Decrease in the Value of Equity

	D Mutual Fund Ltd.	K Mutual Fund Ltd.
Market goes down by	5.00%	5.00%
Beta	1.50	1.10
Equity component goes down	7.50%	5.50%

(IV) Balance of Cash after 1 month

	D Mutual Fund Ltd.	K Mutual Fund Ltd.
Cash in Hand on 31.12.14	₹ 0.71	₹ 2.50
Less: Exp. Per month	₹ 0.25	₹ 0.25
Balance after 1 month	₹ 0.46	₹ 2.25

(i) NAV after 1 month

	D Mutual Fund Ltd.	K Mutual Fund Ltd.
Value of Equity after 1 month		
70 x (1 - 0.075)	₹ 64.75	-
60 x (1 - 0.055)	-	₹ 56.70
Cash Balance	0.46	2.25
	₹ 65.21	₹ 58.95

(ii) Computation to find out more beneficial Mutual fund:

	D Mutual Fund	K Mutual Fund
E(R) - R _F (a)	22.50	16.50
Risk free rate of return (b)	7	7
Expected Return (a-b) =(c)	15.50	9.50
Standard deviation (d)	11.25	5
Risk per unit Return (d/c)	0.73	0.53

Since risk per unit return of D is more than K, hence investor shall choose K Mutual fund from the perspective of risk per unit of return.

11. (i)

Probability	ABC (%)	XYZ (%)	1X2 (%)	1X3 (%)
(1)	(2)	(3)	(4)	(5)
0.20	12	16	2.40	3.20
0.25	14	10	3.50	2.50
0.25	-7	28	-1.75	7.00
0.30	28	-2	<u>8.40</u>	<u>-0.60</u>
Average return			<u>12.55</u>	<u>12.10</u>

Hence the expected return from ABC = 12.55% and XYZ is 12.10%

Probability	(ABC - ABC)	(ABC - ABC)²	1X3	(XYZ - XYZ)	(XYZ - XYZ)²	(1)X(6)
(1)	(2)	(3)	(4)	(5)	(6)	
0.20	-0.55	0.3025	0.06	3.9	15.21	3.04
0.25	1.45	2.1025	0.53	-2.1	4.41	1.10
0.25	-19.55	382.2025	95.55	15.9	252.81	63.20
0.30	15.45	238.7025	<u>71.61</u>	-14.1	198.81	<u>59.64</u>
			<u>167.75</u>			<u>126.98</u>

$$\sigma^2_{ABC} = 167.75(\%)^2; \sigma_{ABC} = 12.95\%$$

$$\sigma^2_{XYZ} = 126.98(\%)^2; \sigma_{XYZ} = 11.27\%$$

- (ii) In order to find risk of portfolio of two shares, the covariance between the two is necessary here.

Probability	(ABC- $\overline{ABC}$)	(XYZ- $\overline{XYZ}$)	2X3	1X4
(1)	(2)	(3)	(4)	(5)
0.20	-0.55	3.9	-2.145	-0.43
0.25	1.45	-2.1	-3.045	-0.76
0.25	-19.55	15.9	-310.845	-77.71
0.30	15.45	-14.1	-217.845	<u>-65.35</u>
				<u>-144.25</u>

$$\sigma^2_P = (0.5^2 \times 167.75) + (0.5^2 \times 126.98) + 2 \times (-144.25) \times 0.5 \times 0.5$$

$$\sigma^2_P = 41.9375 + 31.745 - 72.125$$

$$\sigma^2_P = 1.5575 \text{ or } 1.56(\%)$$

$$\sigma_P = \sqrt{1.56} = 1.25\%$$

$$E(R_p) = (0.5 \times 12.55) + (0.5 \times 12.10) = 12.325\%$$

Hence, the return is 12.325% with the risk of 1.25% for the portfolio. Thus, the portfolio results in the reduction of risk by the combination of two shares.

- (iii) For constructing the minimum risk portfolio, the condition to be satisfied is

$$X_{ABC} = \frac{\sigma_X^2 - r_{AX} \sigma_A \sigma_X}{\sigma_A^2 + \sigma_X^2 - 2r_{AX} \sigma_A \sigma_X} \text{ or } = \frac{\sigma_X^2 - \text{Cov}_{AX}}{\sigma_A^2 + \sigma_X^2 - 2\text{Cov}_{AX}}$$

σ_X = Std. Deviation of XYZ

σ_A = Std. Deviation of ABC

r_{AX} = Coefficient of Correlation between XYZ and ABC

Cov_{AX} = Covariance between XYZ and ABC.

Therefore,

$$\% \text{ ABC} = \frac{126.98 - (-144.25)}{126.98 + 167.75 - [2 \times (-144.25)]} = \frac{271.23}{583.23} = 0.4650 \text{ or } 46.50\%$$

$$\% \text{ ABC} = 46.50\%,$$

$$\% \text{ XYZ} = (1 - 0.4650) = 0.5350 = 53.50\%$$

$$12. \text{ No. of Shares} = \frac{\text{₹ } 1,300 \text{ crores}}{\text{₹ } 40} = 32.50 \text{ Crores}$$

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

$$\text{EPS} = \frac{\text{₹ } 290 \text{ crores}}{32.5 \text{ crores}} = \text{₹ } 8.92$$

Calculation of value per share using Free Cash Flow to Equity as basis:

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

$$\text{FCFE} = 8.92 - [(1-0.27) (47-39) + (1-0.27) (3.45)]$$

$$= 8.92 - [5.84 + 2.52] = \text{₹ } 0.564$$

$$\text{Cost of Equity } (K_e) = R_f + \beta (R_m - R_f)$$

$$= 8.7 + 0.1 (10.3 - 8.7) = 8.86\%$$

$$P_0 = \frac{\text{FCFE}(1+g)}{K_e - g} = \frac{0.56(1.08)}{0.0886 - 0.08} = \frac{0.6048}{0.0086} = \text{₹ } 70.33$$

Calculation of value per share using dividend discount model:

$$P_0 = \frac{D_0(1+g)}{k_e - g} = \frac{2(1.08)}{0.0886 - .08} = \frac{2.16}{0.0086} = \text{₹ } 251.16$$

From the above we can see that value per share on the basis of dividend discount model is more than the value per share on the basis of free cash flow to equity model.

In the dividend discount model, the analyst considers the stream of expected dividends to value the company's stock. It is assumed that the company follows a consistent dividend payout ratio which can be less than the actual cash available with the firm.

A stock's intrinsic value based on the dividend discount model may not represent the fair value for the shareholders because dividends are distributed in the form of cash from profits. In case the company is

maintaining healthy cash in its balance sheet then it means that dividend pay-out is low which could result in undervaluation of the stock.

In the case of free cash flow to equity model a stock is valued on the cash flow available for distribution after all the reinvestment needs of capex and incremental working capital are met. Thus, using the free cash flow to equity model provides a better measure for valuations in comparison to the dividend discount model.

Thus, the view of Mr. Amit that dividend discount model represents the fair value is incorrect. The share is not under-valued rather it is overvalued if we take "free cash flow to equity model" into consideration.

13. To evaluate whether investment in same project is a viable option or not, we shall compute the NPV of the project.

Working Note:

- (1) Expected Exchange Rates

End of Year	INR	INR/MUR
1	$\text{INR } 1.88 \times \frac{(1+0.06)}{(1+0.05)}$	1.8979
2	$\text{INR } 1.8979 \times \frac{(1+0.06)}{(1+0.05)}$	1.9160
3	$\text{INR } 1.9160 \times \frac{(1+0.06)}{(1+0.05)}$	1.9342
4	$\text{INR } 1.9342 \times \frac{(1+0.06)}{(1+0.05)}$	1.9526

- (2) Initial Investment = MUR 100 Million x INR 1.88 = INR 18.80 crore
 Working Capital (Year 1) = MUR 2 Million x 1.8979 = INR 0.3796 crore
 Working Capital (Year 2) = MUR 2 Million x 1.9160 = INR 0.3832 crore
 Working Capital (Year 3) = MUR 2 Million x 1.9342 = INR 0.3868 crore
 Working Capital (Year 4) = MUR 2 Million x 1.9526 = INR 0.3905 crore
- (3) WACC = 40% x 10% + 60% x 12% = 11.20%
- (4) Inflation adjusted Revenue

Year	Revenue (₹)	Revenue (Inflation Adjusted) (₹)
1	6.00 crore	$6.00 \text{ crore} \times 1.10 = 6.60 \text{ crore}$
2	7.00 crore	$7.00 \text{ crore} \times 1.10 \times 1.09 = 8.393 \text{ crore}$
3	8.00 crore	$8.00 \text{ crore} \times 1.10 \times 1.09 \times 1.08 = 10.3594 \text{ crore}$
4	8.00 crore	$8.00 \text{ crore} \times 1.10 \times 1.09 \times 1.08 \times 1.07 = 11.0845 \text{ crore}$

(5) Inflation adjusted Cost

Year	Cost (₹)	Cost (Inflation Adjusted) (₹)
1	3.00 crore	$3.00 \text{ crore} \times 1.12 = 3.3600 \text{ crore}$
2	4.00 crore	$4.00 \text{ crore} \times 1.12 \times 1.10 = 4.9280 \text{ crore}$
3	4.00 crore	$4.00 \text{ crore} \times 1.12 \times 1.10 \times 1.09 = 5.3715 \text{ crore}$
4	4.00 crore	$4.00 \text{ crore} \times 1.12 \times 1.10 \times 1.09 \times 1.08 = 5.8012 \text{ crore}$

(6) Annual cash flows (₹ Crore)

Year	1	2	3	4
Revenue	6.600	8.393	10.3594	11.0845
Less: Cost	3.360	4.928	5.3715	5.8012
Less: Depreciation	1.800	1.800	1.800	1.800
Profit before Tax (PBT)	1.440	1.665	3.1879	3.4833
Tax @ 30%	0.432	0.4995	0.9564	1.0450
Profit after Tax	1.008	1.1655	2.2315	2.4383
Add: Depreciation	1.800	1.800	1.800	1.800
Cash Flows	2.808	2.9655	4.0315	4.2383

NPV of the Project

Year	0	1	2	3	4
Initial Investment (₹ Crore)	(18.80)				

Working Capital (₹ Crore)	-	(0.3796)	(0.3832)	(0.3868)	(0.3905)
Scrap Value (₹ Crore)					0.8000
W.C Recovered (₹ Crore)					1.5401
Annual Cash flows		2.8080	2.9655	4.0315	4.2383
Net Cash Flow	(18.80)	2.4284	2.5823	3.6447	6.1879
Exchange Rate	1.88	1.8979	1.9160	1.9342	1.9526
Cash Flows (in Million MUR)	(100)	12.7952	13.4776	18.8434	31.6906
PVF@11.20%	1	0.8993	0.8087	0.7273	0.6540
Present value (in Million MUR)	(100)	11.5067	10.8993	13.7048	20.7257

Net Present Value = - MUR 43.1635 Million

Advise: Since NPV of the project is negative the proposal is not a viable option for investment.

- 14.** Succession planning is the process of identifying the critical positions within an organization and developing action plans for individuals to assume those positions. A succession plan identifies future need of people with the skills and potential to perform leadership roles.

Taking a holistic view of current and future goals, this type of preparation ensures that the right people are available for the right jobs today and in the years to come. It can also provide a liquidity event, which enables the transfer of ownership in a going concern to rising employees.

Need for succession planning can be explained below:

- ❖ **Risk mitigation** – If existing leader quits, then searches can take six-nine months for suitable candidate to close. Keeping an organization without leader can invite disruption, uncertainty, conflict and endangers future competitiveness.
- ❖ **Cause removal** – If the existing leader is culpable of gross negligence, fraud, wilful misconduct, or material breach while discharging duties and has been barred from undertaking further

activities by court, arbitral tribunal, management, stakeholders or any other agency.

- ❖ **Talent pipeline** – Succession planning keep employees motivated and determined as it can help them obtaining more visibility around career paths expected, which would help in retaining the knowledge bank created by company over a period of time and leverage upon the same.
- ❖ **Conflict Resolution Mechanism** – This planning is very helpful in promoting open and transparent communication and settlement of conflicts.
- ❖ **Aligning** – In family owned business succession planning helps to align with the culture, vision, direction and values of the business.

15. Traditionally, the main role of CFO was concentrated to wealth maximisation for shareholders by taking care of financial health of an organization and overseeing and implementing adequate financial controls.

However, in recent time because of globalization, growth in information and communications, pandemic situation etc. their range of responsibilities has been drastically expanded, driven by complexity, and changing expectations.

Now a days in addition to fulfilling traditional role relating to governance, compliances and controls, and business ethics as a part of the leadership of role CFOs are also expected to contribute their support in strategic and operational decision making.

In post-pandemic time their role has been advanced in the following areas in addition to traditional role:

- a. **Risk Management:** Now a days the CFOs are expected to look after the overall functioning of the framework of Risk Management system of an organisation.
- b. **Supply Chain:** Post pandemic supply chain management system has been posing the challenge for the company to maintain the sustainable growth. Since CFOs are care takers of finance of the company, considering the financial viability of the Supply Chain Management their role has now become more critical.

- c. **Mergers, acquisitions, and Corporate Restructuring:** Since in recent period to maintain the growth and capture the market share there has been a spate of Mergers and Acquisitions and hence the role of CFOs has become more crucial because these are strategic decision and any error in them can lead to collapse of the whole business.
- d. **Environmental, Social and Governance (ESG) Financing:** With the evolving of the concept of ESG their role has been shifted from traditional financing to sustainability financing.

Thus, from above discussion it can be concluded that in today's time CFOs are taking a leadership role in Value Creation for the organisation and that too on sustainable basis for a longer period.