PROBLEMS & SOLUTIONS OF LEVERAGES

Extra Prob. from Latest MU M.com II

1. Calculate operating leverage, financial leverage and combined leverage under situation 1 and 2 in financial plans A & B from the following information relating to the operation and capital structure of a company.

Installed capacity	– 2,000 units
Actual production and sales	– 50% of the capacity
Selling price	₹20 per unit
Variable Cost	₹10 per unit

Fixed Cost:

Under Situation I	₹ 4,000
Under Situation II	₹ 5,000

Capital Structure:

	Financial Plan	
	A (₹)	**B (₹)**
Equity	5,000	15,000
Debt (Rate of Interest 10%)	15,000	5,000
	20,000	**20,000**

(M.com II – Oct 12)

Solution :

Statement of Profitability

Particulars		**Situation I**				**Situation II**			
		Plan A (1,000 Units)		**Plan B (1,000 Units)**		**Plan A (1,000 Units)**		**Plan B (1,000 Units)**	
		Amt	**P.U**	**Amt**	**P.U**	**Amt**	**P.U**	**Amt**	**P.U**
	Sales	20,000	20	20,000	20	20,000	20	20,000	20
(–)	Variable Cost	10,000	10	10,000	10	10,000	10	10,000	10
	Contribution	10,000		10,000		10,000		10,000	
	Fixed Cost	4,000		4,000		5,000		5,000	
	EBIT	6,000		6,000		5,000		5,000	
(–)	Interest	1,500		500		1,500		500	
	EBT	4,500		5,500		3,500		4,500	

1. Operating Leverage $= \dfrac{\text{Contribution}}{\text{EBIT}}$

Situation I		**Situation II**	
Plan A	**Plan B**	**Plan A**	**Plan B**
$\therefore \dfrac{₹\ 10,000}{₹\ 6,000}$	$\therefore \dfrac{₹\ 10,000}{₹\ 6,000}$	$\therefore \dfrac{₹\ 10,000}{₹\ 5,000}$	$\therefore \dfrac{₹\ 10,000}{₹\ 5,000}$
= 1.67	**= 1.67**	**= 2**	**= 2**

2. Financial Leverage $= \dfrac{\text{EBIT}}{\text{EBT}}$

	Situation I		Situation II	
	Plan A	**Plan B**	**Plan A**	**Plan B**
	₹ 6,000 / ₹ 4,500	₹ 6,000 / ₹ 5,500	₹ 5,000 / ₹ 3,500	₹ 5,000 / ₹ 4,500
	= 1.33	**= 1.09**	**= 1.428**	**= 1.1**

3. Combined Leverage = $\frac{\text{Contribution}}{\text{EBT}}$

	Situation I		Situation II	
	Plan A	**Plan B**	**Plan A**	**Plan B**
	₹ 10,000 / ₹ 4,500	₹ 10,000 / ₹ 5,500	₹ 10,000 / ₹ 3,500	₹ 10,000 / ₹ 4,500
	= 2.22	**= 1.818**	**= 2.857**	**= 2.22**

Working Note :

1. Interest :

Plan A : ₹ 15,000 x 10% = ₹ 1,500
Plan B : ₹ 5,000 x 20% = ₹ 500

2. The following key information pertains to Ashika Ltd. for the year 2013-14.

₹ in lakhs

	₹
Sales	82.50
Variable Cost	46.20
Fixed Cost	6.60
9% Debentures	50.00
Equity Shares (₹ 100 each)	60
Corporate Tax	35%

You are required to work out :

1. What is the Company's ROI?
2. Does it have favourable financial leverage?
3. If the firm belongs to an industry whose asset turnover is 3, does it have high or low asset leverage?
4. What is the operating, financial and combined leverage of the firm?
5. What is the Company's EPS?
6. What will be the expected EPS if the Sales of Ashika Ltd. increase by 10% in the next year and cost structure as well as Financial structure remains same?

(M.com II – Apr 13)

Solution :

₹ in lakhs

		₹
	Sales	82.50
(–)	Variable Cost	46.20
	Contribution	36.30
(–)	Fixed Cost	6.60
	Earning Before Interest & Tax (EBIT)	29.70
(–)	Interest (₹ 50 lakhs x 9%)	4.50
	Earning Before Tax (EBT)	25.20
(–)	Tax (35%)	8.82
	EAT	16.38

₹ in lakhs

Capital Employed	
Debt	50
Equity	60
	110

1) Return on Investment (ROI) = $\frac{\text{EBIT}}{\text{Capital Employed}}$ x 100

$= \frac{₹\ 29.70}{₹\ 110}$ x 100 = **27%**

2) Performance of Financial Leverage : Since the ROI is 27% is higher than cost of debt i.e.9%. The firm has favorable financial leverage.

3) Assets T/O Ratio = $\frac{\text{Sales}}{\text{Total Assets}}$

$= \frac{₹\ 82.50}{₹\ 110}$ = **0.75 times**

. Since 0.75 times is less than the industries average i.e. 3 times, therefore the firm has low asset leverage.

4) Operating Leverage = $\frac{\text{Contribution}}{\text{EBIT}}$

$\therefore \frac{₹\ 36.30}{₹29.70}$ = **1.22**

∴ Financial Levrge = $\frac{\text{EBIT}}{\text{EBT}}$

$\therefore \frac{₹29.70}{₹\ 25.20}$ = **1.18**

∴ Combined Leverage = $\frac{\text{Contribution}}{\text{EBT}}$

$\therefore \frac{₹\ 36.30}{₹\ 25.20}$ = **1.44**

OR Combined Leverage = OL x FL

∴ 1.22 x 1.18 = **1.44**

5) Earning Per Share :

∴ EPS = $\frac{\text{Profit to Equity Shareholders}}{\text{No. of Equity Shares}}$

$= \frac{₹\ 16,38,000}{60,000 \text{ shares}}$ **= ₹ 27.30**

e) If the sales increase by 10% what will be the new EPS :

∴ Increase in Combined Leverage : 1.44 x 10% = 0.144

∴ Increase in EPS : ₹ 27.30 + (₹ 27.30 x 0.144) = **₹ 31.2312**

OR

₹ in lakhs

		₹
	Sales [₹ 82.50 + 10%]	90.75
(–)	Variable Cost [₹ 46.20 + 10%]	50.82
	Contribution	39.93
(–)	Fixed Cost	6.60
	Earning Before Interest & Tax (EBIT)	33.33
(–)	Interest (₹ 50 lakhs x 9%)	4.50
	Earning Before Tax (EBT)	28.83
(–)	Tax (35%)	10.0905
	EAT	18.7395

$$\therefore \textbf{EPS} = \frac{\text{Profit to Equity Shareholders}}{\text{No. of Equity Shares}}$$

$$= \frac{₹\ 18,73,950}{60,000 \text{ shares}} = \textbf{₹ 31.2325}$$

3. The selected financial data for A, B and C companies for the year ended 31st March, 2014 were as follows:

	A	**B**	**C**
Variable Cost as a Percentage of Sales	$66^2/_3$	75	50
Interest Expenses (₹)	200	300	1,000
Degree of Operating Leverage	5	6	6
Degree of Financial Leverage	3	4	2
Income Tax Rate	35%	35%	35%

Prepare an income statement for each of the companies.

(M.com II – Oct 13)

Solution :

Particulars		**A Amt**	**B Amt**	**C Amt**
	Sales	4,500	9,600	24,000
(–)	Variable Cost	3,000	7,200	12,000
	Contribution	1,500	2,400	12,000
	Fixed Cost	1,200	2,000	10,000
	EBIT	300	400	2,000
(–)	Interest	200	300	1,000
	EBT	100	100	1,000
(–)	Tax	35	35	350
		65	65	650

Working Note :

1. Financial Leverage $= \frac{\text{EBIT}}{\text{EBT}}$ $\therefore \frac{\text{EBIT}}{(\text{EBIT} - \text{Int.})}$

Let the EBIT be χ

A	B	C
$\therefore \quad 3 = \frac{\chi}{(\chi - 200)}$	$\therefore \quad 4 = \frac{\chi}{(\chi - 300)}$	$\therefore \quad 2 = \frac{\chi}{(\chi - 1{,}000)}$
$\therefore \quad 3(\chi - 200) = \chi$	$\therefore \quad 4(\chi - 300) = \chi$	$\therefore \quad 2(\chi - 1{,}000) = \chi$
$\therefore \quad 3\chi - 600 = \chi$	$\therefore \quad 4\chi - 1{,}200 = \chi$	$\therefore \quad 2\chi - 2{,}000 = \chi$
$\therefore \quad 3\chi - \chi = 600$	$\therefore \quad 4\chi - \chi = 1{,}200$	$\therefore \quad 2\chi - \chi = 2{,}000$
$\therefore \quad 2\chi = 600$	$\therefore \quad 3\chi = 1{,}200$	
$\therefore \quad \chi = {}^{600}/_{2}$	$\therefore \quad \chi = {}^{1{,}200}/_{3}$	$\therefore \quad \mathbf{\chi = 2{,}000}$
$\therefore \quad \mathbf{\chi = 300}$	$\therefore \quad \mathbf{\chi = 400}$	

2. Operating Leverage $= \frac{\text{Contribution}}{\text{EBIT}}$

Let the Contribution be χ

A	B	C
$\therefore \quad 5 = \frac{\chi}{300}$	$\therefore \quad 6 = \frac{\chi}{400}$	$\therefore \quad 6 = \frac{\chi}{2{,}000}$
$\therefore \quad \chi = 5 \times 300$	$\therefore \quad \chi = 6 \times 400$	$\therefore \quad \chi = 6 \times 2{,}000$
$\therefore \quad \mathbf{\chi = 1{,}500}$	$\therefore \quad \mathbf{\chi = 2{,}400}$	$\therefore \quad \mathbf{\chi = 12{,}000}$

3. Sales

∴ Let the Sales be 100

∴ Sales – Variable Cost = Contribution

	A	B	C
∴ Contribution =	$100 - 66\,{}^{2}/_{3}$	= $100 - 75$	= $100 - 50$
	= $33\,{}^{1}/_{3}$	= 25	= 50

∴ Sales =

A		B		C	
For $33\,{}^{1}/_{3}$	– 1,500	For 25	– 2,400	For 50	– 12,000
For 100	– ?	For 100	– ?	For 100	– ?
	4,500		**9,600**		**24,000**

Comments : The Financial position of 'Company C' is better in all the companies due to following reasons.

a) The financial risk for company C is very less as compare to other companies as it has lesser financial leverage.

b) The combined leverage of Company C is also less which indicates lesser amount of business risk.

c) The P/V ratio of the company is 50% which is highest amongst all the three companies due to which the contribution of Company C is more.

d) The ability to cover interest is better in Company C which is shown below.

Interest Coverage Ratio = $\frac{\text{EBIT}}{\text{Interest}}$

Company A = $\frac{₹\ 300}{₹\ 200}$ = 1.5 times

Company B = $\frac{₹\ 400}{₹\ 300}$ = 1.33 times

Company C = $\frac{₹\ 2,000}{₹\ 1,000}$ = 2 times

4. From the following prepare Income statement of company A and B.

	A Co.	**B Co.**
Financial leverage	4 : 1	5 : 1
Interest	₹ 6,00,000	₹ 7,00,000
Operating Leverage	3 : 1	4 : 1
Variable cost to sales	66.66%	50%
Income tax rate	30%	40%
No. of Equity Shares	1,00,000	70,000

Also Calculate and comments on EPS of the company.

(M.com II – Apr 14)

Solution :

Particulars	**A Amt**	**B Amt**
Sales	72,00,000	70,00,000
(–) Variable Cost	48,00,000	35,00,000
Contribution	24,00,000	35,00,000
Fixed Cost	16,00,000	26,25,000
EBIT	8,00,000	8,75,000
(–) Interest	6,00,000	7,00,000
EBT	2,00,000	1,75,000
(–) Tax	60,000	70,000
EAT	1,40,000	1,05,000
(÷) No. of Shares	1,00,000	70,000
EPS	**₹ 1.40**	**₹ 1.50**

Working Note :

1. Financial Leverage $= \frac{\text{EBIT}}{\text{EBT}}$ $\therefore \frac{\text{EBIT}}{(\text{EBIT} - \text{Int.})}$

Let the EBIT be χ

A **B**

$\therefore \quad 4 = \frac{\chi}{(\chi - 6,00,000)}$ $\therefore \quad 5 = \frac{\chi}{(\chi - 7,00,000)}$

$\therefore \quad 4\ (\chi - 6,00,000) = \chi$ $\therefore \quad 5\ (\chi - 7,00,000) = \chi$ $\therefore$

∴	$4\chi - 24,00,000 = \chi$	∴	$5\chi - 35,00,000 = \chi$	∴	
∴	$4\chi - \chi = 24,00,000$	∴	$5\chi - \chi = 35,00,000$	∴	
∴	$3\chi = 24,00,000$	∴	$4\chi = 35,00,000$	∴	
∴	$\chi = {}^{24,00,000}/_{3}$	∴	$\chi = {}^{35,00,000}/_{4}$	∴	
∴	**χ = 8,00,000**	∴	**χ = 8,75,000**	∴	

2. Operating Leverage = $\frac{\text{Contribution}}{\text{EBIT}}$

Let the Contribution be χ

	A		**B**
∴	$3 = \frac{\chi}{8,00,000}$	∴	$4 = \frac{\chi}{8,75,000}$
∴	$\chi = 3 \times 8,00,000$	∴	$\chi = 4 \times 8,75,000$
∴	**χ = 24,00,000**	∴	**χ = 35,00,000**

3. Sales

∴ Let the Sales be 100

∴Sales – Variable Cost = Contribution

	A		**B**
∴**Contribution =**	$100 - 66^{2}/_{3}$	=	$100 - 50$
=	$33^{1}/_{3}$	=	50

∴**Sales =**

A		**B**	
For $33^{1}/_{3}$	– 24,00,000	For 50	– 35,00,000
For 100	– ?	For 100	– ?
	72,00,000		**70,00,000**

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∴**Combined Leverage** = Operating Leverage x Financial Leverage

	A		**B**
∴	4 x 3	∴	5 x 4
∴	**12**	∴	**20**

Comment : It is to be noted that both financial & operating leverage is more in company B is more which indicates that the Company B is risky. Inspite of lesser amount of sales in Company B, the profitability of Company B is high as compare to Company A due to greater amount of contribution. This is the only reason due to which the company C has high EPS.