

Question 16

The following data relate to RT Ltd:

	(₹)
Earnings before interest and tax (EBIT)	10,00,000
Fixed cost	20,00,000
Earnings Before Tax (EBT)	8,00,000

Required: Calculate combined leverage.

Answer—

Contribution:

$$C = S - V \text{ and}$$

$$\text{EBIT} = C - F$$

$$10,00,000 = C - 20,00,000$$

$$\therefore C = 30,00,000$$

[C—Contribution, S—Sales, V—Variable cost, F—Fixed Cost]

$$\text{Operating leverage (OL)} = C/\text{EBIT} = 30,00,000/10,00,000 = 3 \text{ times}$$

$$\text{Financial leverage (FL)} = \text{EBIT}/\text{EBT} = 10,00,000/8,00,000 = 1.25 \text{ times}$$

$$\text{Combined leverage (CL)} = (\text{OL}) \times \text{FL} \times 1.25 = 3.75 \text{ times}$$

Question 17

A company operates at a production level of 1,000 units. The contribution is ₹ 60 per unit, operating leverage is 6, and combined leverage is 24. If tax rate is 30%, what would be its earnings after tax?

Answer—

Computation of Earnings after tax

$$\text{Contribution} = ₹ 60 \times 1,000 = ₹ 60,000$$

$$\text{Operating Leverage (OL)} \times \text{Financial Leverage (FL)} = \text{Combined Leverage (CL)}$$

$$6 \times \text{Financial Leverage} = 24$$

$$\therefore \text{Financial Leverage} = 4$$

$$\text{Operating Leverage} = \frac{\text{Contribution}}{\text{EBIT}} = \frac{₹ 60,000}{\text{EBIT}} = 6$$

$$\therefore \text{Financial Leverage} = \frac{\text{EBIT}}{\text{EBT}} = 4$$

$$\therefore \text{EBT} = \frac{\text{EBIT}}{4} = \frac{10,000}{4} = ₹ 2,500$$

EBIT- Earnings before Interest and tax.

EBT- Earnings before tax.

Since tax rate = 30%

Earnings after Tax (EAT)

$$= \text{EBT} (1 - 0.30) [30\% \text{ is tax rate}]$$

$$= 2,500 (0.70)$$

Earnings after Tax (EAT) = 1750

Question 3

Consider the following information for Omega Ltd.:

	in Lakhs
EBIT (Earnings before Interest and Tax)	15,750
Earnings before Tax (EBT):	7,000
Fixed Operating costs:	1,575

Required:

Calculate percentage change in earnings per share, if sales increase by 5%.

Answer

Operating Leverage (OL)

$$= \frac{\text{Contribution}}{\text{EBIT}} = \frac{\text{EBIT} + \text{Fixed Cost}}{\text{EBIT}} = \frac{₹15,750 + ₹1,575}{15,750} = 1.1$$

Financial Leverage

$$(\text{FL}) = \frac{\text{EBIT}}{\text{EBT}} = \frac{15,750}{7,000} = 2.25$$

Combined Leverage (CL)

$$= 1.1 \times 2.25 = 2.475$$

Percentage change in Earnings per share

$$\text{DCL} = \frac{\% \text{ change in EPS}}{\% \text{ change in Sales}} \quad 2.475 = \frac{\% \text{ change in EPS}}{5\%}$$

$$\therefore \% \text{ change in EPS} = 12.375\%$$

Hence if sales is increased by 5% EPS will be increased by 12.375%

Question 4

A company operates at a production level of 5,000 units. The contribution is ₹ 60 per unit, operating leverage is 6, combined leverage is 24. If tax rate is 30%, what would be its earnings after tax?

Answer—

Computation of Earnings after tax (EAT) or Profit after tax (PAT)

Total contribution = 5,000 units × ₹ 60/unit = ₹ 3,00,000

Operating leverage (OL) × Financial leverage (FL) = Combined leverage (CL)

$$6 \times FL = 24$$

$$FL = 4$$

$$\therefore OL = \frac{\text{Contribution}}{\text{EBIT}}$$

$$\therefore 6 = \frac{₹3,00,000}{\text{EBIT}}$$

$$\therefore \text{EBIT} = ₹50,000$$

$$FL = \frac{\text{EBIT}}{\text{EBT}} \quad \therefore 4 = \frac{₹50,000}{\text{EBT}} \quad \therefore \text{EBT} = ₹12,500$$

Since tax rate is 30%, therefore, Earnings after tax = 12,500 × 0.70 = ₹8,750

Earnings after tax (EAT) = ₹ 8,750

Question 325

X Limited has estimated that for a new product its break-even point is 20,000 units if the item is sold for ₹ 14 per unit and variable cost ₹ 9 per unit. Calculate the degree of operating leverage for sales volume 25,000 units and 30,000 units.

Answer—

Computation of Operating Leverage (OL) Selling Price = ₹ 14 per unit

Variable Cost = ₹ 9 per unit

Fixed Cost = BEP × (Selling price – Variable cost) = 20,000 × (14 – 9) = 20,000 × 5 = 1,00,000

Particulars	For 25,000 units (₹)	For 30,000 units (₹)
Sales @ ₹ 14 unit	3,50,000	4,20,000
Less: Variable Cost @ ₹ 9 unit	2,25,000	2,70,000
Contribution	1,25,000	1,50,000
Less: Fixed Cost	1,00,000	1,00,000
Earnings before interest and tax (EBIT)	25,000	50,000
OL $\left(\frac{\text{Contribution}}{\text{EBIT}} \right)$	$\left(\frac{1,25,000}{25,000} \right)$	$\left(\frac{1,50,000}{50,000} \right)$
OL	5 times	3 times

Question 328

Consider the following information for Strong Ltd:

	₹In lakh
EBIT	1,120
PBT	320
Fixed Cost	700

Calculate the percentage in earnings per share, if sales increased by 5 percent.

Answer

Percentage change in earning per share to the percentage change in sales is calculated through degree of combined leverage.

Hence, Computation of percentage of change in earnings per share, if sales increased by 5%

$$\text{Degree of Combined leverage (DCL)} = \frac{\% \text{ change in Earning per share (EPS)}}{\% \text{ change in sales}}$$

Moreover, Degree of operating leverage (DOL) \times Degree of Financial Leverage (DFL) = Degree of combined leverage (DCL)

$$\text{Or, } \text{DOL} \times \text{DFL} = \frac{\% \text{ change in Earning per share (EPS)}}{\% \text{ change in sales}}$$

$$\text{Or, } 1.625 \times 3.5 \text{ [Refer to working notes (i) and (ii)]} = \frac{\% \text{ change in Earning per share (EPS)}}{5}$$

$$\text{Or, } 5.687 = \frac{\% \text{ change in Earning per share (EPS)}}{5}$$

$$\text{Or, } \% \text{ Change in EPS} = 5.687 \times 28.4375\%$$

So, if sales is increased by 5 percent, Percentage of change in earnings per share will be 28.4375%

Working Notes:

$$(i) \text{ Degree of Operating leverage (DOL)} = \frac{\text{Contribution}}{\text{EBIT}} = \frac{(\text{₹}1,120 + \text{₹}700 \text{ lakhs})}{\text{₹}1,120 \text{ lakhs}} = 1.625$$

$$(ii) \text{ Degree of financial leverage (DFL)} = \frac{\text{EBIT}}{\text{PBT}} = \frac{\text{₹}1,120}{\text{₹}320} = 3.5$$

Question

He data relating to two companies are as given below:

	Company A	Company B
Equity capital	₹ 6,00,000	₹3,50,000
12% Debentures	₹4,00,000	₹6,50,000
Output (units) per annum	60,000	15,000
Selling price/unit	₹30	₹250
Fixed costs per annum	₹7,00,000	₹14,00,000
Variable Cost per unit	₹10	₹75

You are required to calculate the Operating leverage, Financial leverage and Combined leverage of two Companies.

Answer—

Computation of degree of Operating leverage, Financial leverage and Combined leverage of two companies

	Company A	Company B
Output units per annum	60,000	15,000
	(₹)	(₹)
Selling price/unit	30	250
Sales revenue	18,00,000	37,50,000
	(60,000 units × ₹30)	(15,000 units × ₹250)
Less : Variable Costs	6,00,000	11,25,000
	(60,000 units × ₹10)	(15,000 units × ₹75)
Contribution (C)	12,00,000	26,25,000
Less : Fixed Costs	7,00,000	14,00,000
EBIT (Earnings before Interest and tax)	5,00,000	12,25,000
Less: Interest @ 12% on debentures	48,000	78,000
PBT	4,52,000	11,47,000

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Operating Leverage = $\frac{\text{Contribution}}{\text{EBIT}}$	2.4 (12,00,000/5,00,000)	2.14 (26,25,000/12,25,000)
Financial Leverage = $\frac{\text{EBIT}}{\text{PBT}}$	1.11 (5,00,000/4,52,000)	1.07 (12,25,000/11,47,000)
	2.66	2.29
Combined Leverage = DOL × DFL	(2.4 × 1.11)	(2.14 × 1.07)

Question 8

A firm has Sales of ₹40 lakhs; Variable cost of ₹25 lakhs; Fixed cost of ₹6 lakhs; 10% debt of ₹30 lakhs and Equity Capital of ₹45 lakhs.

Required:

Calculate operating and financial leverage.

Answer—

Calculation of Operating and Financial Leverage

	(₹)
Sales	40,00,000
Less: Variable Cost	<u>25,00,000</u>
Contribution (C)	15,00,000
Less: Fixed Cost	<u>6,00,000</u>
EBIT	9,00,000
Less: Interest	<u>3,00,000</u>
EBT	<u>6,00,000</u>

$$\text{Operating Leverage} = \frac{C}{\text{EBIT}} = \frac{₹15,00,000}{₹9,00,000} = 1.67$$

$$\text{Financial Leverage} = \frac{\text{EBIT}}{\text{EBT}} = \frac{₹9,00,000}{₹6,00,000} = 1.50$$

The net sales of A Ltd. is ₹ 30 crores. Earnings before interest and tax of the company as a percentage of net sales is 12%. The capital employed comprises ₹ 10 crores of equity, ₹ 2 crores of 13% Cumulative Preference Share Capital and 15% Debentures of ₹ 6 crores. Income-tax rate is 40%.

- Calculate the Return-on-equity for the company and indicate its segments due to the presence of Preference Share Capital and Borrowing (Debentures).
- Calculate the Operating Leverage of the Company given that combined leverage is 3.

Answer—

- Net Sales : ₹ 30 crores
EBIT ₹ 3.6 crores (@ 12% on sales)

$$ROI = \frac{EBIT}{\text{Capital Employed}} = \frac{3.6}{10 + 2 + 6} \times 100 = 20\%$$

	(' in crores)
EBIT	3.6
Interest on Debt	0.9
EBT	2.7
Less: Tax @ 40%	1.08
EAT	1.62
Less: Preference Dividend	0.26
Earnings available for Equity Shareholders	1.36
Return on Equity = $1.36/10 \times 100$	13.6%

Segments due to the presence of Preference Share capital and Borrowing (Debentures)

Segment of ROE due to preference capital :

$$[ROCE - K_p] \frac{P}{E} = [12 - 13] \frac{2}{10} = -0.2\%$$

$$\text{Segment of ROE due to Debentures: } [ROCE - K_D] \frac{D}{E} = [12 - 9] \frac{6}{10} = 1.8\%$$

$$\text{Total} = -0.2\% + 1.8\% = +1.6\%$$

The weighted average cost of capital is as follows

Source	Proportion	Cost (%)	WACC(%)
(i) Equity	10/18	13.60	7.56
(ii) Preference Shares	2/18	13.00	1.44
(iii) Debt	6/18	9.00	3.00
		Total	12.00

$$(ii) \text{ Degree of Financial Leverage} = \frac{EBIT}{EBIT - \text{Interest} - \frac{\text{Preference dividend}}{1 - T}}$$

$$= \frac{3.6}{3.6 - .9 - \frac{.26}{1 - .40}} = \frac{3.6}{3.6 - .9 - .43} = 1.5859$$

Degree of Combined Leverage = $DPL \times DOL$

$$3 = 1.5859 \times DOL$$

$$\therefore DOL = \frac{3}{1.5859} =$$

Degree of Operating Leverage = 1.8917

Cost of Debenture after Tax

$$K_d = 15\% [1 - 4] = 9\%$$

Question (10)

Not in course

The following summarises the percentage changes in operating income, percentage changes in revenues, and betas for four pharmaceutical firms.

Firm	Change in revenue	Change in operating income	Beta
PQR Ltd.	27%	25%	1.00
RST Ltd.	25%	32%	1.15
TUV Ltd.	23%	36%	1.30
WXY Ltd.	21%	40%	1.40

OL
.925
1.28
1.56
1.90

Required:

- Calculate the degree of operating leverage for each of these firms. Comment also.
- Use the operating leverage to explain why these firms have different beta.

Answer (i) Degree of operating leverage = $\frac{\% \text{Change in Operating income}}{\% \text{Change in Revenues}}$

PQR Ltd.	=	25% / 27%	=	0.9259
RST Ltd.	=	0.32 / 0.25	=	1.28
TUV Ltd.	=	0.36 / 0.23	=	1.5652
WXY Ltd.	=	0.40 / 0.21	=	1.9048

It is level specific.

- High operating leverage leads to high beta. So when operating leverage is lowest i.e. 0.9259, Beta is minimum (1) and when operating leverage is maximum i.e. 1.9048, beta is highest i.e. 1.40

Question 11 A Company had the following Balance Sheet as on March 31, 2006:

Liabilities	₹(in crores)	Assets	₹(in crores)
Equity Share Capital (one crore shares of ₹10 each)	10	Fixed Assets (Net)	25
Reserves and Surplus	2	Current Assets	15
15% Debentures	20		
Current Liabilities	8		
	40		40

The additional information given is as under:

Fixed Costs per annum (excluding interest) ₹ 8 crores

Variable operating costs ratio 65%

Total Assets turnover ratio 2.5

Income-tax rate 40%

Required :

Calculate the following and comment:

- Earnings per share
- Operating Leverage
- Financial Leverage
- Combined Leverage.

Answer — Total Assts = ₹40 crores

Total Asset Turnover Ratio i.e. $\frac{\text{Total Sales}}{\text{Total Assets}} = 2.5$

Hence, Total Sales = $40 \times 2.5 = ₹100$ crores

Computation of profits after Tax (PAT)

	₹(in crores)
Sales	100
Less : Variable operating cost @ 65%	65
Contribution	35
Less : Fixed cost (other than Interest)	8
EBIT (Earning before interest and tax)	27
Less : Interest on debentures (15%×20)	3
EBT (Earning before tax)	24
Less: Tax 40%	9.6
EAT (Earning after tax)	14.4

(i) Earnings per share

$$\therefore \text{EPS} = \frac{\text{₹14.4 crores}}{1 \text{ crore equity shares}} = 14.4$$

(ii) Operating Leverage

$$\text{Operating leverage} = \frac{\text{Contribution}}{\text{EBIT}} = \frac{35}{27} = 1.296$$

It indicates fixed cost in cost structure. It indicates sensitivity of earnings before interest and tax (EBIT) to change in sales at a particular level.

(iii) Financial leverage

$$\text{Financial Leverage} = \frac{\text{EBIT}}{\text{EBT}} = \frac{27}{24} = 1.125$$

The financial leverage is very comfortable since the debt service obligation is small vis-à-vis EBIT.

(iv) Combined Leverage

$$= \text{Combined Leverage} = \frac{\text{contribution}}{\text{EBIT}} \times \frac{\text{EBIT}}{\text{EBT}} \times 1.296 \times 1.125 = 1.458$$

The combined leverage studies the choice of fixed cost in cost structure and choice of debt in capital structure. It studies how sensitive the change in EPS is vis-à-vis change in sales.

The leverages — operating, financial and combined are measures of risk.

Question 12-15

Annual sales of a company is ₹ 60,00,000 Sales to variable cost ratio is 150 per cent and Fixed cost other than interest is ₹ 5,00,000 per annum. Company has 11 per cent debentures of ₹ 30,00,000. You are required to calculate the operating, Financial and combined leverage of the company.

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Answer—

Calculation of Leverages

Particulars	(₹)
Sales	60,00,000
Less: Variable Cost $\left(\text{Sales} \times \frac{100}{150} \right)$	40,00,000
Contribution	20,00,000
Less: Fixed Cost	5,00,000
EBIT	15,00,000
Less: Interest on Debentures	3,30,000
EBT	11,70,000

$$\text{Operating Leverage} = \frac{\text{Contribution}}{\text{EBIT}} = \frac{₹20,00,000}{₹15,00,000} = 1.3333$$

$$\text{Financial Leverage} = \frac{\text{EBIT}}{\text{EBT}} = \frac{₹15,00,000}{₹11,70,000} = 1.2821$$

$$\text{Combined Leverage} = \text{OL} \times \text{FL} \text{ or } \frac{\text{Contribution}}{\text{EBT}}$$

$$= 1.3333 \times 1.2821 \text{ or } \frac{₹20,00,000}{₹11,70,000} = 1.7094$$

Question 13

Delta Ltd. currently has an equity share capital of ₹ 10,00,000 consisting of 1,00,000 Equity share of ₹ 10 each. The company is going through a major expansion plan requiring to raise funds to the tune of ₹ 6,00,000. To finance the expansion the management has following plans:

Plan-I : Issue 60,000 Equity shares of ₹ 10 each.

Plan-II : Issue 40,000 Equity shares of ₹ 10 each and the balance through long-term borrowing at 12% interest p.a.

Plan-III : Issue 30,000 Equity shares of ₹ 10 each and 3,000, 9% Debentures of ₹ 100 each.

Plan-IV : Issue 30,000 Equity shares of ₹ 10 each and the balance through 6% preference shares.

The EBIT of the company is expected to be ₹ 4,00,000 p.a. assume corporate tax rate of 40%. Required:

- Calculate EPS in each of the above plans.
- Ascertain financial leverage in each plan.

Answer

Sources of Capital	Plan I	Plan II	Plan III	Plan IV
Present Equity Shares	1,00,000	1,00,000	1,00,000	1,00,000
New Issue	60,000	40,000	30,000	30,000
Equity share capital (₹)	16,00,000	14,00,000	13,00,000	13,00,000
No. of Equity shares	1,60,000	1,40,000	1,30,000	1,30,000
12% Long term loan (₹)	—	2,00,000	—	—
9% Debenture (₹)	—	—	3,00,000	—
6% Preference Shares (₹)	—	—	—	3,00,000

Computation of EPS and Financial Leverage

Sources of Capital	Plan I	Plan II	Plan III	Plan IV
EBIT (₹)	4,00,000	4,00,000	4,00,000	4,00,000
Interest on 12% Loan (₹)	—	24,000	—	—
Interest on 9% debentures (₹)	—	—	27,000	—
EBT (₹)	4,00,000	3,76,000	3,73,000	4,00,000
Less : Tax @ 40%	1,60,000	1,50,400	1,49,200	1,60,000
EAT (₹)	2,40,000	2,25,600	2,23,800	2,40,000
Less: Preference Dividends (₹)	—	—	—	18,000
(a) Net Earnings available for equity shares (₹)	2,40,000	2,25,600	2,23,800	2,22,000
(b) No. of equity shares	1,60,000	1,40,000	1,30,000	1,30,000
(c) EPS (a ÷ b) ₹	1.50	1.61	1.72	1.71
Financial leverage-				
$\left(\frac{EBIT}{EBIT - I} \right)$ or $\left(\frac{EBIT}{EBT} \right)$	1.00	1.06	1.07	1.08

* EBT is Earnings before tax but after interest and preference dividend in case of Plan IV.

Comments: Since the EPS and financial leverage both are highest in plan III, the management could accept

	Company A (₹)	Company B (₹)
Variable Cost	56,000	60% of Sales
Fixed Cost	20,000	—
Interest Expenses	12,000	9,000
Financial Leverage	5 : 1	—
Operating Leverage	—	4 : 1
Income Tax Rate	30%	30%
Sales	—	1,05,000

Financial leverage—

$$\left(\frac{\text{EBIT}}{\text{EBIT} - I} \right) \text{ or } \left(\frac{\text{EBIT}}{\text{EBT}} \right) \quad 1.00 \quad 1.06 \quad 1.07 \quad 1.08$$

* EBT is Earnings before tax but after interest and preference dividend in case of Plan IV.

Comments: Since the EPS and financial leverage both are highest in plan III, the management could accept it.

Question 14 Z Limited is considering the installation of a new project costing ₹ 80,00,000. Expected annual sales revenue from the project is ₹ 90,00,000 and its variable costs are 60 percent of sales. Expected annual fixed cost other than interest is ₹ 10,00,000. Corporate tax rate is 30 percent. The company wants to arrange the funds through issuing 4,00,000 equity shares of ₹ 10 each and 12 percent debentures of ₹ 40,00,000.

You are required to:

- Calculate the operating, financial and combined leverages and Earnings per Share (EPS).
- Determine the likely level of EBIT, if EPS is ₹ 4, or ₹ 2, or Zero.

Answer

- Calculation of Leverages and Earnings per Share (EPS)

Income Statement

Particulars	(₹)
Sales Revenue	90,00,000
Less: Variable Cost @60% Contribution	54,00,000
	36,00,000
Less: Fixed Cost other than Interest	10,00,000
	26,00,000
Less: Interest (12% on ₹40,00,000)	4,80,000
Earnings before tax (EBT)	21,20,000
Less : Tax @30%	6,36,000
Earnings after tax (EAT)/Profit after tax (PAT)	14,84,000

- (1) Calculation of Operating Leverage (OL)

$$\text{Operating Leverage} = \frac{\text{Contribution on EBIT}}{\text{EBIT}} = \frac{₹36,00,000}{26,00,000} = 1.3846$$

- (2) Calculation of Financial Leverage (FL)

$$\text{Financial Leverage} = \frac{\text{EBIT}}{\text{EBT}} = \frac{₹26,00,000}{21,20,000} = 1.2264$$

- (3) Calculation of Combined Leverage (CL)

$$\text{Combined Leverage} = \text{OL} \times \text{FL} = 1.3846 \times 1.2264 = 1.6981$$

$$\text{Or, } = \frac{\text{Contribution}}{\text{EBT}} = \frac{₹36,00,000}{₹21,20,000} = 1.6981$$

- (4) Calculation of Earnings per share (EPS)

$$\text{EPS} = \frac{\text{EAT/PAT}}{\text{Number of Equity Shares}} = \frac{₹14,84,000}{4,00,000} = 3.71$$

- (i) Calculation of likely levels of EBIT at Different EPS

$$\text{EPS} = \frac{(\text{EBIT} - I)(1 - T)}{\text{Number of Equity Shares}}$$

- (1) If EPS is ₹ 4

$$4 = \frac{(EBIT - 4,80,000)(1 - 0.3)}{4,00,000} \text{ Or, } EBIT - ₹4,80,000 = \frac{₹16,00,000}{0.70}$$

$$EBIT - ₹4,80,000 = ₹22,85,714 \text{ Or, } EBIT = ₹27,65,714$$

(2) IF EPS is ₹ 2

$$2 = \frac{(EBIT - ₹4,80,000)(1 - 0.3)}{₹4,00,000} \text{ Or, } EBIT - ₹4,80,000 = \frac{₹8,00,000}{0.70}$$

$$EBIT - ₹4,80,000 = ₹11,42,857 \text{ Or, } EBIT = ₹16,22,857$$

(3) IF EPS is

$$0 = \frac{(EBIT - ₹4,80,000)(1 - 0.3)}{₹4,00,000} \text{ Or, } EBIT = ₹4,80,000$$

Question 15 - The following details of RST Limited for the year ended 31st March, 2015 are given below:

Operating leverage	1.4
Combination leverage	2.8
Fixed Cost (Excluding interest)	₹2.04 Lakhs
Sales	₹30.00 lakhs
12% Debentures of ₹ 100 each	₹21.25 lakhs
Equity Share Capital of ₹10 each	₹17.00 lakhs
Income tax rate	30 percent

Required:

- Calculate Financial leverage
- Calculate P/V ratio and Earnings per Share (EPS)
- If the company belongs to an industry, whose assets turnover is 1.5 does it have a high or low assets turnover?
- At what level of sales the Earnings before Tax (EBT) of the company will be equal to zero?

Answer—

(i) Financial leverage

$$\text{Combined leverage} = \text{Operating Leverage (OL)} \times \text{Financial Leverage (FL)}$$

$$2.8 = 1.4 \times FL \quad \text{Or, } FL = 2$$

$$\text{Financial Leverage} = 2$$

(ii) P/V Ratio and EPS

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$$\text{Operating leverage} = \frac{\text{Contribution (C)}}{C - \text{Fixed Cost (FC)}} \times 100$$

$$1.4 = \frac{C}{C - 2,04,000} \text{ Or } 1.4(C - 2,04,000) = C$$

$$\text{Or, } 1.4C - 2,85,600 = C \text{ Or, } C = \frac{2,85,600}{0.4} = C = 7,14,000$$

$$\text{Now, P/V ratio} = \frac{\text{Contribution (C)}}{\text{Sales (S)}} \times 100 = \frac{Rs. 7,14,000}{Rs. 30,00,000} \times 100 = 23.8\%$$

Therefore, P/V Ratio = 23.8%

$$\text{EPS} = \frac{\text{Profit after tax}}{\text{No. of equity shares}}$$

$$\text{EBT} = \text{Sales} - V - \text{FC} - \text{Interest}$$

$$= ₹30,00,000 - ₹22,86,000 - ₹2,04,000 - ₹2,55,000 = ₹2,55,000$$

$$\text{PAT} = \text{EBT} - \text{Tax}$$

$$= ₹2,55,000 - ₹76,500 = ₹1,78,500$$

$$\text{EPS} = \frac{₹1,78,500}{₹1,70,000} = 1.05$$

$$(iii) \text{ Assets turnover} = \frac{\text{Sales}}{\text{Total Assets}} = \frac{₹30,00,000}{₹38,25,000} = 0.784$$

0.784 < 1.5 means lower than industry turnover

(iv) EBT zero means 100% reduction in EBT. Since combined leverage is 2.8, sales have to be dropped by $100/2.8 = 35.71\%$. Hence new sales will be $₹30,00,000 \times (100 - 35.71) = ₹19,28,700$. Therefore, at ₹19,28,700 level of sales, the Earnings before Tax of the company will be equal to zero.

Question 16 From the following financial data of company A and Company B: Prepare their Income Statements.

	Company A (₹)	Company B (₹)
Variable Cost	56,000	60% of Sales
Fixed Cost	20,000	—
Interest Expenses	12,000	9,000
Financial Leverage	5 : 1	—
Operating Leverage	—	4 : 1
Income Tax Rate	30%	30%
Sales	—	1,05,000

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Income Statements of Company A and Company B

	Company A (₹)	Company B (₹)
Sales	91,000	1,05,000
Less: Variable Cost	56,000	63,000
Contribution	35,000	42,000
Less: Fixed Cost	20,000	31,500
Earnings before interest and tax (EBIT)	15,000	10,500
Less: Interest	12,000	9,000
Earnings before tax (EBT)	3,000	1,500
Less: Tax @ 30%	900	450
Earnings after tax (EAT)	2,100	1,050

Working Notes:

Company A

$$(i) \text{ Financial Leverage} = \frac{\text{EBIT}}{\text{EBT i.e. EBIT} - \text{Interest}}$$

$$\text{So, } 5 = \frac{\text{EBIT}}{\text{EBIT} - 12,000}$$

$$\text{Or, } 5 (\text{EBIT} - 12,000) = \text{EBIT}$$

$$\text{Or, } 4 \text{ EBIT} = 60,000$$

$$\text{Or, } \text{EBIT} = ₹15,000$$

$$(ii) \text{ Contribution} = \text{EBIT} + \text{Fixed Cost} \\ = ₹15,000 + ₹20,000 = ₹35,000$$

$$(iii) \text{ Sales} = \text{Contribution} + \text{Variable cost} \\ = ₹35,000 + ₹56,000 = ₹91,000$$

Company B

$$(i) \text{ Contribution} = 40\% \text{ of Sales (as Variable Cost is 60\% of Sales)} \\ = 40\% \text{ of } 1,05,000 = ₹42,000$$

$$(ii) \text{ Operating Leverage} = \frac{\text{Contribution}}{\text{EBIT}} \text{ Or, } 4 = \frac{₹42,000}{\text{EBIT}}$$

$$\text{EBIT} = \frac{₹42,000}{4} = ₹10,500$$

$$(iii) \text{ Fixed Cost} = \text{Contribution} - \text{EBIT} = 42,000 - 10,500 = ₹31,500$$

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Calculate the operating leverage, financial leverage and combined leverage for the following firms and interpret the results:

	P	Q	R
Output (units)	2,50,000	1,25,000	7,50,000
Fixed Cost (₹)	5,00,000	2,50,000	10,00,000
Unit Variable cost (₹)	5	2	7.50
Unit Selling Price (₹)	7.50	7	10.0
Interest Expenses	75,000	25,000	—

Answer— Estimation of Degree of Operating Leverage (DOL), Degree of Financial Leverage (DFL) and Degree of Combined Leverage (DCL)

	P	Q	R
Selling Price (per unit)	2,50,000	1,25,000	7,50,000
	₹	₹	₹
Selling Price (per unit)	7.50	7	10
Sales Revenues (Output × Selling Price)	18,75,000	8,75,000	75,00,000
Less: Variable Cost (Output × Variable Cost)	12,50,000	2,50,000	56.25,000
Contribution Margin	6,25,000	6,25,000	18,75,000
Less: Interest Expenses	75,000	25,000	—
Earnings before Tax (EBT)	50,000	3,50,000	8,75,000

$$DOL = \frac{\text{Contribution}}{\text{EBIT}}$$

5

1.67

2.14

$$DFL = \frac{\text{EBIT}}{\text{EBT}}$$

2.5

1.07

1.00

$$DCL = DOL \times DFL$$

12.5

1.79

2.14

Comment

Aggressive
Policy

Moderate
Policy

Moderate policy
with no financial
leverage

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Question 18 Calculate the operating leverage, financial leverage and combined leverage for the following firms: 39 6.19

Particulars	N	S	D
Production (in units)	17,500	6,700	31,800
Fixed Costs (₹)	4,00,000	3,50,000	2,50,000
Interest on loan (₹)	1,25,000	75,000	Nil
Selling price per unit (₹)	85	130	37
Variable Cost per unit (₹)	38.00	42.50	12.00

Answer—

Computation of Degree of Operating Leverage (DOL), Degree of Financial Leverage (DFL) and Degree of Combined Leverage (DCL)

Particulars	Firm N	Firm S	Firm D
Output (Units)	17,500	6,700	31,800
	₹	₹	₹
Selling Price/Unit	85	130	37
Selling Revenue (Output × Selling Price per Unit) (A)	14,87,500	8,71,000	11,76,600
Variable Cost/Unit	38.00	42.50	12.00
Less: Total Variable Cost (Output × Variable cost per Unit) (B)	6,65,000	2,84,750	3,81,600
Contribution (C) (A-B)	8,22,500	5,86,250	7,95,000
Less : Fixed Cost	4,00,000	3,50,000	2,50,000
Earnings before Interest and Tax (EBIT)	4,22,500	2,36,250	5,45,000
Less : Interest on Loan	1,25,000	75,000	NIL
EBT	2,97,500	1,61,250	5,45,000

$$\text{Operating Leverage (OL)} = \frac{C}{\text{EBIT}} \quad \frac{4,22,500}{2,97,500} = 1.95 \quad \frac{5,86,250}{2,36,250} = 2.48 \quad \frac{7,55,000}{5,45,000} = 1.46$$

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Question — The following information related to XL company Ltd. for the year ended 31st March, 2016 are available to you:

Equity share capital of ₹ 10 each	₹25 lakh
11% Bonds of ₹1000 each	₹ 18.5 lakh
Sales	₹42c lakh
Fixed Cost (Excluding Interest)	₹3.48 lakh
Financial leverage	1.39
Profit–Volume Ratio	25.55%
Income Tax Rate Applicable	35%

You are required to calculate:

- Operating Leverage;
- Combined Leverage; and
- Earning per Share.

Answer

$$\text{Profit Volume Ratio} = \frac{\text{Contribution}}{\text{Sales}} \times 100$$

$$\text{So, } 25.55 = \frac{\text{Contribution}}{\text{₹42,00,000}} \times 100 \quad \text{Or, Contribution} = 42,00,000 \times 25.55$$

$$\text{Contribution} = ₹10,73,100$$

Income Statement

Particulars	(₹)
Sales	42,00,000
Variable cost (Sales – Contribution)	31,26,900
Contribution	10,73,100
Fixed Cost	3,48,000
EBIT	7,25,000
Interest	2,03,500
EBT (EBIT – Interest)	5,21,600
Tax	1,82,500
Profit after Tax (EBT– Tax)	3,39,040

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- (i) Operating Leverage = $\frac{\text{Contribution}}{\text{Earnings before interest and tax (EBIT)}}$
- Or, $\frac{\text{Contribution}}{\text{Contribution} - \text{Fixed Cost}} = \frac{₹10,73,100}{₹10,73,100 - ₹3,48,000}$
- (ii) Combined Leverage = Operating Leverage × Financial Leverage
- = $1.48 \times 1.39 = 2.06$
- Or, = $\frac{\text{Contribution}}{\text{EBT}}$ i.e. = $\frac{₹10,73,100}{₹5,21,600} = 2.06$
- (iii) Earnings Per Share (EPS)

$$\text{EPS} = \frac{\text{PAT}}{\text{No. of Share}} = \frac{₹3,39,040}{₹2,50,000} = 1.3561$$

EPS = 1.36

Question 68— The Capital structure of RST Ltd. is as follows:

Particulars	(₹)
Equity Share of ₹ 10 each	8,00,000
10% Preference Share of ₹ 100 each	5,00,000
12% Debentures of ₹ 100 each	7,00,000
	20,00,000

Additional Information:

- Profit after tax (Tax Rate 30%) are ₹ 2,80,000
- Operating Expenses (including Depreciation ₹ 96,800) are 1.5 times of EBIT
- Equity Dividend paid is 15%
- Market price of Equity Share is ₹ 23

Calculate:

- Operating and Financial Leverage
- Cover for preference and equity dividend
- The Earning Yield Ratio and Price Earning Ratio
- The Net Fund Flow

Answer—

Working Notes—

Additional Information:

- Profit after tax (Tax Rate 30%) are ₹ 2,80,000

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LEVERAGE

- Operating Expenses (including Depreciation ₹ 96,800) are 1.5 times of EBIT
- Equity Dividend paid is 15%
- Market price of Equity Share is ₹ 23

Calculate:

- Operating and Financial Leverage
- Cover for preference and equity dividend
- The Earning Yield Ratio and Price Earning Ratio
- (iv) The Net Fund Flow

Answer—

Working Notes:

	(₹)
Net Profit after Tax	2,80,000
Tax @ 30%	1,20,000
EBT	4,00,000
Interest on Debentures	84,000
EBIT	4,84,000
Operating Expenses (1.5 times of EBIT)	7,26,000
Sales	12,10,000

(i) Operating Leverage

$$= \frac{\text{Contribution}}{\text{EBIT}} = \frac{\text{₹}(12,10,000 - 6,29,200)}{\text{₹}4,84,000} = \frac{\text{₹}5,80,000}{\text{₹}4,84,000} = 1.2 \text{ times}$$

$$\text{Financial Leverage} = \frac{\text{EBIT}}{\text{EBT}} = \frac{4,84,000}{4,00,000} = 1.21 \text{ times}$$

(ii) Cover for Preference Dividend

$$= \frac{\text{PAT}}{\text{Preference Share Dividend}} = \frac{\text{₹}2,80,000}{\text{₹}50,000} = 5.6 \text{ times}$$

Cover for Equity Dividend

$$= \frac{(\text{PAT} - \text{Preference Dividend})}{\text{Equity Share Dividend}} = \frac{\text{₹}(2,80,000 - 50,000)}{\text{₹}1,20,000}$$

(Prefer Note B with Answer) ✓

$$\begin{aligned} \Rightarrow & \frac{\text{EBIT}}{\text{EBIT} - I - P.D.} \\ \Rightarrow & \frac{4,84,000}{4,84,000 - 84,000 - 50,000} \\ \Rightarrow & \frac{4,84,000}{32,8571} \Rightarrow 1.47 \end{aligned}$$

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$$= \frac{₹2,30,000}{₹1,20,000} = 1.92 \text{ times}$$

(iii) Earning Yield Ratio

$$= \frac{\text{EPS}}{\text{Market Price}} \times 100 = \left(\frac{2,30,000}{\frac{80,000}{23}} \times 100 \right)$$

Price – Earnings Ratio (PE Ratio)

$$\frac{\text{Market Price}}{\text{EPS}} = \frac{23}{2.875} = 8 \text{ times}$$

(iv) Net Funds Flow

$$= \text{Net PAT} + \text{Depreciation} - \text{Total Dividend}$$

$$₹2,80,000 + ₹96,800 - ₹(50,000 + 1,20,000)$$

$$= ₹3,76,800 - ₹1,70,000$$

$$\text{Net Funds Flow} = ₹2,06,800$$

Question 21 Following information are related to four firms of the same industry:

Firm	Change in Revenue	Change in Operating Income	Change in Earning per Share
P	27%	25%	30%
Q	25%	32%	24%
R	23%	36%	21%
S	21%	40%	23%

Find out:

- Degree of operating leverage, and
- degree of combined leverage for all the firms

Answer—

Calculation of Degree of Operating leverage and Degree of combined leverage

Firm Degree of Operating Leverage (DOL) Degree of Combined Leverage (DCL)

$$= \frac{\% \text{ change in Operating Income}}{\% \text{ change in Revenue}}$$

$$= \frac{\% \text{ change in EPS}}{\% \text{ change in Revenue}}$$

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LEVERAGE

$$\begin{array}{lcl}
 P & = \frac{25\%}{27\%} = 0.926 & = \frac{30\%}{27\%} = 1.111 \\
 Q & = \frac{32\%}{25\%} = 1.280 & = \frac{24\%}{25\%} = 0.960 \\
 R & = \frac{36\%}{23\%} = 1.565 & = \frac{21\%}{23\%} = 0.913 \\
 S & = \frac{40\%}{21\%} = 1.905 & = \frac{23\%}{21\%} = 1.095
 \end{array}$$

Question 32

The capital structure of ABC Ltd. as at 31.3.15 consisted of ordinary share capital of ₹ 5,00,000 (face value ₹ 100 each) and 10% debentures of ₹ 5,00,000 (₹ 100 each). In the year ended with March 15, sales decreased from 60,000 units to 50,000 units. During this year and in the previous year, the selling price was ₹ 12 per unit; variable cost stood at ₹ 8 per unit and fixed expenses were at ₹ 1,00,000 p.a. The income tax rate was 30%.

You are required to calculate the following:

- The percentage of decrease in earnings per share.
- The degree of operating leverage at 60,000 units and 50,000 units.
- The degree of financial leverage at 60,000 units and 50,000 units.

Answer

Sales in units	60,000 (₹)	50,000 (₹)
Sales Value	7,30,000	6,00,000
Variable Cost	(4,80,000)	(4,00,000)
Contribution	2,40,000	2,00,000
Fixed expenses	(1,00,000)	(1,00,000)
EBIT	1,40,000	1,00,000
Debenture Interest	(50,000)	(50,000)
EBT	90,000	50,000
Tax @ 30%	(27,000)	(15,000)
Profit after tax (PAT)	63,000	35,000

$$\begin{array}{lcl}
 (i) \text{ Earnings per share (EPS)} & = \frac{63,000}{5,000} = ₹12.6 & = \frac{35,000}{5,000} = ₹7 \\
 \text{Decreases in EPS} & = 12.6 - 7 = 5.6 &
 \end{array}$$

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$$\% \text{ decrease in EPS} = \frac{5.6}{12.6} \times 100 = 44.44\%$$

$$(ii) \text{ Operating leverage} = \frac{\text{Contribution}}{\text{EBIT}} = \frac{\text{₹}2,40,000}{\text{₹}1,40,000} = 1.71 \quad \frac{\text{₹}2,00,000}{\text{₹}1,00,000} = 2$$

$$(iii) \text{ Financial Leverage} = \frac{\text{EBIT}}{\text{EBT}} = \frac{\text{₹}1,40,000}{\text{₹}90,000} = 1.56 \quad = \frac{\text{₹}1,00,000}{\text{₹}50,000} = 2$$

Question 23. From the following details of X Ltd., prepare the Income Statement for the year ended 31st December, 2014:

Financial Leverage	2
Interest	₹2,000
Operating Leverage	3
Variable cost as a percentage of sales	75%
Income tax rate	30%

Answer—

Workings:

$$(i) \text{ Financial Leverage} = \frac{\text{EBIT}}{\text{EBIT} - \text{Interest}} \text{ Or, } 2 = \frac{\text{EBIT}}{\text{EBIT} - \text{₹}2,000}$$

$$\text{Or, EBIT} = \text{₹}4,000$$

$$(ii) \text{ Operating Leverage} = \frac{\text{Contribution}}{\text{EBIT}} \text{ Or, } 3 = \frac{\text{Contribution}}{\text{₹}4,000}$$

$$\text{Or, Contribution} = \text{₹}12,000$$

$$(iii) \text{ Sales} = \frac{\text{Contribution}}{\text{P/V Ratio}} = \frac{\text{₹}12,000}{25\%} = \text{₹}48,000$$

$$(iv) \text{ Fixed Cost} = \text{Contribution} - \text{Fixed Cost} = \text{EBIT}$$

$$= \text{₹}12,000 - \text{Fixed Cost} = \text{₹}4,000 \text{ Or, Fixed cost} = \text{₹} 8,000$$

Income Statement for the year ended 31st December, 2014

Particulars	Amount (₹)
Sales	48,000
Less: Variable Cost (75% of ₹ 48,000)	(36,000)
Contribution	12,000
Less : Fixed Cost (Contribution – EBIT)	4,000
Less : Interest	(2,000)
Earning Before Tax (EBT)	2,000
Less Income Tax @30%	(600)
Earnings After Tax (EAT or PAT)	1,400

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Question 24
A firm has sales of ₹75,00,000 variable cost is 56% and fixed cost is ₹ 6,00,000. It has a debt of ₹ 45,00,000 at 9% and equity of ₹ 55,00,000.

- What is the firm's ROI?
- Does it have favourable financial leverage?
- If the firm belongs to an industry whose capital turnover is 3, does it have a high or low capital turnover?
- What are the operating, financial and combined leverages of the firm?
- If the sales is increased by 10% by what percentage EBIT will increase?
- At what level of sales the EBT of the firm will be equal to zero?
- If EBIT increases by 20%, by what percentage EBT will increase?

Answer

Income Statement

Particulars	Amount (₹)
Sales	75,00,000
Less: Variable cost (56% of 75,00,000)	42,00,000
Contribution	33,00,000
Less: Fixed costs	6,00,000
Earnings before interest and tax (EBIT)	27,00,000
Less: Interest on debt @ 9% on ₹45 lakhs	4,05,000
Earnings before tax (EBT)	22,95,000

$$(i) \quad ROI = \frac{EBIT}{\text{Capital employed}} \times 100 = \frac{EBIT}{\text{Equity} + \text{Debt}} \times 100$$

$$= \frac{₹27,00,000}{₹(55,00,000 + 45,00,000)} \times 100 = 27\%$$

(ROI is calculated on Capital Employed)

- (ii) ROI = 27% and Interest on debt is 9%, hence, it has a favourable financial leverage.

$$(iii) \quad \text{Capital Turnover} = \frac{\text{Net Sales}}{\text{Capital}}$$

$$\text{Or.} = \frac{\text{Net Sales}}{\text{Capital}} = \frac{₹75,00,000}{₹1,00,00,000} = 0.75$$

Which is very low as compared to industry average of 3.

- (iv) Calculation of Operating, financial and Combined leverages

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$$(a) \text{ Operating Leverage} = \frac{\text{Contribution}}{\text{EBIT}} = \frac{₹33,00,000}{₹27,00,000} = 1.22 \text{ (approx)}$$

$$(b) \text{ Financial Leverage} = \frac{\text{EBIT}}{\text{EBT}} = \frac{₹27,00,000}{₹22,95,000} = 1.18 \text{ (approx)}$$

$$(c) \text{ Combined Leverage} = \frac{\text{Contribution}}{\text{EBT}} = \frac{₹33,00,000}{₹22,95,000} = 1.44$$

Or, Operating Leverage \times Financial Leverage = $1.22 \times 1.18 = 1.44$ (approx)

(v) Operating leverage is 1.22×10 i.e. 12.20% (approx)

(vi) Since the combined Leverage is 1.44, shares have to drop by $100/1.44$ i.e. 69.44% to bring EBT to Zero

$$\begin{aligned} \text{Accordingly, New Sales} &= ₹75,00,000 \times (1 - 0.6944) \\ &= ₹75,00,000 \times 0.3056 \\ &= ₹22,92,000 \text{ (approx)} \end{aligned}$$

Hence at ₹22,92,000 sales level EBT of the firm will be equal to Zero.

(vii) Financial leverage is 1.18 So, If EBIT increases by 20% then EBT will increase by $1.18 \times 20 = 23.6\%$ (approx)
