

Leverages

Leverage means Risk.

Risk involves in business because of Fixed Cost.

[Coaching class]

COST

variable cost

(Text book)

NO Risk

Fixed cost

Combined leverage (Risk)

operating
Fixed cost

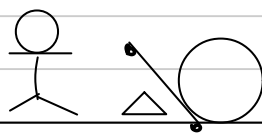
(Rent)

operating
Leverage (Risk)

Financial
Fixed cost

(Interest)

Financial
Leverage (Risk)



Concept Question

Selling Price : 10 p.u.
 Variable Cost : 8 p.u.
 Total Fixed Cost : 100 (Rent)
 Total Interest : 75
 Tax : 20%
 NO OF ES : 10
 No of units sold = 100 units
 Calculate all leverages.

EBIT = Earning before Interest & Tax
 EBT = Earning before Tax
 EAT = Earning after Tax.
 ES = Equity share
 EPS = Earning Per share
 OL = Operating leverage
 FL = Financial leverage
 CL = Combined leverage

Solution:

Income Statement: (100 units)

Particulars	Total	
Sales	10	1000
- Variable Cost	(8)	(800)
Contribution	2	200
- Fixed Cost	100	$\rightarrow OL = \frac{\text{Contribution}}{\text{EBIT}} = \frac{200}{100} = 2 \text{ times}$
EBIT	100	
- Interest	(75)	$\rightarrow FL = \frac{\text{EBIT}}{\text{EBT}} = \frac{100}{25} = 4 \text{ times}$
EBT	25	
- Tax @ 20%	(5)	$CL = \frac{\text{Contribution}}{\text{EBT}} = \frac{200}{25} = 8 \text{ times}$
EAT	20	
- Preference Dividend	-	Or
Earning for ES	20	$CL = OL \times FL$
\div NO OF ES	$\div 10$	$= 2 \times 4 = 8 \text{ times.}$
EPS	2	

EBIT is also known as operating income.

	(a)	(b)	$\left(\frac{b-a}{a} \times 100\right)$	
<u>Income statement: (100 units)</u>		<u>(120 units)</u>		
<u>Particulars</u>	<u>Total</u>	<u>Total</u>	<u>% Change</u>	
Sales	10 1000	1200	20%	same OL = $\frac{\% \Delta \text{ in EBIT}}{\% \Delta \text{ in Sales}}$
- Variable cost	(8) (800)	(960)	20%	
Contribution	2 200	240	20%	
- Fixed cost	100	100	-	$\frac{40}{20} = 2 \text{ times}$
EBIT	100	140	40%	
- Interest	(75)	(75)	-	same FL = $\frac{\% \Delta \text{ in EPS}}{\% \Delta \text{ in EBIT}}$ (4)
EBT	25	65	160%	
- Tax @ 20%	(5)	(13)	160%	
EAT	20	52	160%	same $\frac{160}{40} = 4 \text{ times}$
- Preference Dividend	-	-	-	
Earning for Es	20	52	160%	CL = $\frac{\% \Delta \text{ in EPS}}{\% \Delta \text{ in Sales}}$ (8) $\frac{160}{20} = 8 \text{ times}$
÷ NO OF Es	÷ 10	10	-	
EPS	2	5.2	160%	

Leverage



Operating Leverage

Financial Leverage

Combined Leverage

a) $\frac{\text{Contribution}}{\text{EBIT}}$

a) $\frac{\text{EBIT}}{\text{EBT}}$

a) $\frac{\text{Contribution}}{\text{EBT}}$

b) $\frac{\% \Delta \text{ EBIT}}{\% \Delta \text{ Sales}}$

b) $\frac{\% \Delta \text{ EPS}}{\% \Delta \text{ EBIT}}$

b) $\frac{\% \Delta \text{ in EPS}}{\% \Delta \text{ in Sales}}$

c) say OL = 2 times
1% change in sales
leads to
2% change in EBIT

c) say FL = 4 times
1% change in EBIT
leads to
4% change in EPS

c) say CL = 8 times
1% change in sales
leads to
8% change in EPS

PP3

operating leverage = $\frac{1}{\text{MOS Ratio}}$

DOL : Degree of Operating Leverage

Illustration 1

A Company produces and sells

Question 1. (Illustration 1)

A Company produces and sells 10,000 shirts. The selling price per shirt is ₹ 500. Variable cost is ₹ 200 per shirt and fixed operating cost is ₹ 25,00,000.

- (a) CALCULATE operating leverage.
- (b) If sales are up by 10%, then COMPUTE the impact on EBIT?

Solution:

(WN-1): Income Statement

Particulars		10,000 units
Sales	(500)	50,00,000
Variable cost	(200)	20,00,000
Contribution	(300)	30,00,000
Fixed cost		(25,00,000)
EBIT		50,00,000

a) Operating leverage

$$\text{Contribution} = \frac{30,00,000}{50,00,000} = 6 \text{ times}$$

b) Impact on EBIT

$$\text{Operating Leverage} = \frac{\% \Delta \text{ EBIT}}{\% \Delta \text{ Sales}}$$

$$6 = \frac{\% \Delta \text{ EBIT}}{10}$$

$$\% \Delta \text{ in EBIT} = 10 \times 6 = 60\%$$

∴ EBIT will increase by 60%.

Illustration 3

A firm's details are as under

Question 3. (Illustration 3)

A firm's details are as under:

Sales (@100 per unit)	₹ 24,00,000
Variable Cost	50%
Fixed Cost	₹ 10,00,000

It has borrowed ₹ 10,00,000 @ 10% p.a. and its equity share capital is ₹ 10,00,000 (₹ 100 each).

Consider tax @ 50 %.

CALCULATE:

- (a) Operating Leverage
- (b) Financial Leverage
- (c) Combined Leverage
- (d) Return on Investment
- (e) If the sales increases by ₹ 6,00,000; what will the new EBIT?

(WN-7): Income statement:

<u>Particulars</u>	<u>Total</u>
Sales	2400,000
- variable cost (2400,000 × 50%)	(1200,000)
Contribution	1200,000
- Fixed Cost	(10,00,000)
EBIT	200,000
- Interest (10,00,000 × 10%)	(100,000)
EBT	100,000
- Tax @ 50%	(50,000)
EAT / NP for ES	50,000
÷ NO of ES (10,00,000 ÷ 100)	÷ 10,000
EPS	5

$$a) \text{ Operating Leverage} = \frac{\text{Contribution}}{\text{EBIT}} = \frac{1200,000}{200,000} = 6 \text{ times.}$$

$$b) \text{ Financial Leverage} = \frac{\text{EBIT}}{\text{EBT}} = \frac{200,000}{100,000} = 2 \text{ times}$$

$$c) \text{ Combined Leverage} = \frac{\text{Contribution}}{\text{EBT}} = \frac{1200,000}{100,000} = 12 \text{ times}$$

or

$$\begin{aligned} \text{Combined Leverage} &= \text{Operating Leverage} \times \text{Financial Leverage} \\ &= 6 \times 2 = 12 \text{ times.} \end{aligned}$$

$$d) \text{ Return on Investment} = \frac{\text{NP for ES}}{\text{Equity share Capital}} \times 100 = \frac{50,000}{10,00,000} \times 100 = 5\%$$

e) New EBIT:

<u>Particulars</u>	<u>Total</u>
Revised Sales (2400,000 + 600,000)	30,00,000
- variable cost (30,00,000 × 50%)	(1500,000)
Contribution	1500,000
- Fixed Cost	(10,00,000)
New EBIT	500,000

"Or"

New EBIT:

$$i) \% \Delta \text{ in sales} = \frac{600,000}{2400,000} \times 100 = 25\%$$

$$ii) \text{ operating Leverage} = \frac{\% \Delta \text{ EBIT}}{\% \Delta \text{ sales}}$$

$$6 = \frac{\% \Delta \text{ EBIT}}{25}$$

$$\therefore \% \Delta \text{ EBIT} = 25 \times 6 = 150\%$$

$$\therefore \text{New EBIT} = 200,000 + 150\% = 500,000.$$

Question 6. (PP 1)

From the following information extracted

From the following information extracted from the books of accounts of Imax Ltd., CALCULATE percentage change in earnings per share, if sales increase by 10% and Fixed Operating cost is ₹ 1,57,500.

Particulars	(₹)
EBIT (Earnings before Interest and Tax)	31,50,000
Earnings before Tax (EBT)	14,00,000

Solution:(WN-1): Income Statement:

Particulars	Total
Contribution	3307500 (3150,000 + 157500)
- Fixed Cost	157500
EBIT	3150,000
- Interest	1750,000 (3150,000 - 1400,000)
EBT	1400,000

(WN-2): Combined leverage:

$$\frac{\text{Contribution}}{\text{EBT}} = \frac{3307500}{1400,000} = 2.3625 \text{ times.}$$

3. % change in EPS:

$$\text{Combine Leverage} = \frac{\% \Delta \text{ EPS}}{\% \Delta \text{ sales}}$$

$$2.3625 = \frac{\% \Delta \text{ EPS}}{10}$$

$$2.3625 \times 10 = \% \Delta \text{ in EPS}$$

$$\% \Delta \text{ in EPS} = 23.625\%$$

The capital structure of PS Ltd. at the end

Question 9. (PP 4)

The capital structure of PS Ltd. at the end of the current Financial Year consisted as follows:

Particulars	(₹)
Equity share capital (face value ₹ 100 each)	10,00,000
10% debentures (₹ 100 each)	10,00,000

During the year, sales decreased to 1,00,000 units as compared to 1,20,000 units in the previous year. However, the selling price stood at ₹ 12 per unit and variable cost at ₹ 8 per unit for both the years. The fixed expenses were at

₹ 2,00,000 p.a. and the income tax rate is 30%. You are required to CALCULATE the following:

- (i) The degree of financial leverage at 1,20,000 units and 1,00,000 units.
- (ii) The degree of operating leverage at 1,20,000 units and 1,00,000 units.
- (iii) The percentage change in EPS.

Solution:

(WN-1): Income statement:

Particulars		<u>Year 1</u> 120,000 units	<u>Year 2</u> 100,000 units
Sales	(12)	1440,000	1200,000
- variable cost	(8)	(960,000)	(800,000)
Contribution	(4)	480,000	400,000
- Fixed cost		(200,000)	(200,000)
EBIT		280,000	200,000
- Interest (10,00,000 × 10%)		(100,000)	(100,000)
EBT		180,000	100,000
- Tax @ 30%		(54,000)	(30,000)
EAT / NP for ES		126,000	70,000
÷ NO of ES (10,00,000 ÷ 100)		÷ 10,000	÷ 10,000
EPS		12.6	7

Particulars		<u>120,000 units</u>	<u>100,000 units</u>
i) Financial Leverage = $\frac{EBIT}{EBT}$		$\frac{280,000}{180,000} = 1.56$ times	$\frac{200,000}{100,000} = 2$ times

ii) Operating Leverage = $\frac{Contribution}{EBIT}$		$\frac{480,000}{280,000} = 1.71$ times	$\frac{400,000}{200,000} = 2$ times
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iii) % Δ in EPS = $\frac{12.6 - 7}{12.6} \times 100 = 44.44\%$ (Reduction in EPS)

Question 12. (PP 8)

CALCULATE the operating leverage, financial leverage

CALCULATE the operating leverage, financial leverage and combined leverage from the following data under Situation I and II and Financial Plan A and B :

Installed Capacity	4,000 units
Actual Production and Sales	75% of the Capacity
Selling Price	₹ 30 Per Unit
Variable Cost	₹ 15 Per Unit

Fixed Cost:

Under Situation-I	₹ 15,000
Under Situation-II	₹ 20,000

Capital Structure:

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

Solution:

(WN-1) : Income Statement:

Particulars	situation I		situation II	
	Plan A	Plan B	Plan A	Plan B
Total contribution	45000	45000	45000	45000
[Quantity : 4000 x 75% = 3000]				
[Contribution : (30-15) x 3000 = 45000]				
Fixed cost	(15000)	(15000)	(20,000)	(20,000)
EBIT	30,000	30,000	25000	25000
- Interest	(2000)	(1000)	(2000)	(1000)
(Plan A: 10,000 x 20%)				
(Plan B: 5000 x 20%)				
EBT	28000	29000	23000	24000
Leverages:				
a) Operating Leverage = $\frac{\text{Contribution}}{\text{EBIT}}$	$\frac{45000}{30000}$	$\frac{45000}{30000}$	$\frac{45000}{25000}$	$\frac{45000}{25000}$
	1.5	1.5	1.8	1.8
b) Financial Leverage = $\frac{\text{EBIT}}{\text{EBT}}$	$\frac{30000}{28000}$	$\frac{30000}{29000}$	$\frac{25000}{23000}$	$\frac{25000}{24000}$
	1.07	1.03	1.09	1.04
c) Combined Leverage = $OL \times FL$	1.5×1.07	1.5×1.03	1.8×1.09	1.8×1.04
	1.61	1.55	1.96	1.87

You are given the following information

Question 15. (PP 11)

You are given the following information of 5 firms of the same industry:

Name of the Firm	Change in Revenue	Change in Operating Income	Change in Earning per share
M	28%	26%	32%
N	27%	34%	26%
P	25%	38%	23%
Q	23%	43%	27%
R	25%	40%	28%



You are required to CALCULATE for all firms:

Operating Income means EBIT

- (i) Degree of operating leverage and
- (ii) Degree of combined leverage.

Solution:

Firm	<u>Operating leverage</u> $\frac{\% \Delta \text{ EBIT}}{\% \Delta \text{ Sales}}$	<u>Combined leverage</u> $\frac{\% \Delta \text{ EPS}}{\% \Delta \text{ Sales}}$
M	$\frac{26}{28} = 0.93$	$\frac{32}{28} = 1.14$
N	$\frac{34}{27} = 1.26$	$\frac{26}{27} = 0.96$
P	$\frac{38}{25} = 1.52$	$\frac{23}{25} = 0.92$
Q	$\frac{43}{23} = 1.87$	$\frac{27}{23} = 1.17$
R	$\frac{40}{25} = 1.6$	$\frac{28}{25} = 1.12$

The following data have been extracted

Question 16. (PP 12)

The following data have been extracted from the books of LM Ltd:

Sales - ₹ 100 lakhs

Interest Payable per annum - ₹ 10 lakhs

Operating leverage - 1.2

Combined leverage - 2.16

You are required to calculate:

- (i) The financial leverage,
- (ii) Fixed cost and
- (iii) P/V ratio

Solution:

1) Financial leverage

$$\text{Combined leverage} = \text{Operating leverage} \times \text{Financial leverage}$$

$$2.16 = 1.2 \times FL$$

$$\therefore \text{Financial leverage} = \frac{2.16}{1.2} = 1.8 \text{ times.}$$

(WN-1): Income statement:

Sales	100,00,000	
- Variable Cost	73,00,000	(100,00,000 - 27,00,000)
Contribution (WN-3)	27,00,000	
- Fixed Cost	4,50,000	(27,00,000 - 22,50,000)
EBIT (WN-2)	22,50,000	
- Interest	10,00,000	
EBT	12,50,000	

(WN-2) EBIT

$$\text{Financial leverage} = \frac{\text{EBIT}}{\text{EBIT} - \text{Interest}}$$

$$1.8 = \frac{\text{EBIT}}{\text{EBIT} - 10,00,000}$$

$$1.8 (\text{EBIT} - 10,00,000) = \text{EBIT}$$

$$1.8 \text{ EBIT} - 18,00,000 = \text{EBIT}$$

$$1.8 \text{ EBIT} - \text{EBIT} = 18,00,000$$

$$0.8 \text{ EBIT} = 18,00,000$$

$$\text{EBIT} = 22,50,000$$

(WN-3) : Contribution

$$\text{Operating leverage} = \frac{\text{Contribution}}{\text{EBIT}}$$

$$1.2 = \frac{\text{Contribution}}{22,50,000}$$

$$\therefore \text{Contribution} = 1.2 \times 22,50,000 = 27,00,000$$

ii) Fixed Cost = (WN-1) = Rs. 450,000 .

iii) Profit Volume Ratio:

$$\frac{\text{Contribution}}{\text{Sales}} \times 100$$

$$\frac{2700,000}{100,00,000} \times 100 = 27\%$$

Extra Income Statement: (short cut)

	<u>OL</u>		<u>FL</u>
Sales		100,00,000	
- Variable Cost		<u>7300,000</u>	
Contribution	1.2	2700,000	
- Fixed Cost	0.2	<u>450,000</u>	
EBIT	1	2250,000	1.8
- Interest		<u>10,00,000</u>	0.8
EBT		1250,000	1

Consider the following information

Question 7. (PP 2)

Consider the following information for Mega Ltd.:

Production level	2,500 units
Contribution per unit	₹ 150
Operating leverage	6
Combined leverage	24
Tax rate	30%

Required:

COMPUTE its earnings after tax.

Solution:**1. Earning after tax:**

Contribution (2500×150)	375000	
- Fixed Cost	312500	(375000 - 62500)
EBIT (WN-1)	62500	
- Interest	46875	(62500 - 15625)
EBT (WN-3)	15625	
- Tax @ 30%	(4688)	
EAT	10937	

(WN-1) : EBIT

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

$$6 = \frac{375000}{\text{EBIT}}$$

$$\therefore \text{EBIT} = \frac{375000}{6} = 62500$$

(WN-3) EBT

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

$$4 = \frac{62500}{\text{EBT}}$$

$$\text{EBT} = \frac{62500}{4}$$

$$\text{EBT} = 15625$$

(WN-2) : Financial leverage

$$\text{Combined Leverage} = \text{Operating Leverage} \times \text{Financial Leverage}$$

$$24 = 6 \times \text{FL}$$

$$\therefore \text{Financial leverage} = \frac{24}{6} = 4$$

Betatronics Ltd. has the following

Question 11. (PP 6)

Betatronics Ltd. has the following balance sheet and income statement information:

Balance Sheet

Liabilities	(₹)	Assets	(₹)
Equity capital (₹ 10 per share)	8,00,000	Net fixed assets	10,00,000
10% Debt	6,00,000	Current assets	9,00,000
Retained earnings	3,50,000		
Current liabilities	1,50,000		
	19,00,000		19,00,000

Income Statement for the year

Particulars	(₹)
Sales	3,40,000
Operating expenses (including ₹ 60,000 depreciation)	1,20,000
EBIT	2,20,000
Less: Interest	60,000
Earnings before tax	1,60,000
Less: Taxes	56,000
Net Earnings (EAT)	1,04,000

- (a) DETERMINE the degree of operating, financial and combined leverages at the current sales level, if all operating expenses, other than depreciation, are variable costs.
- (b) If total assets remain at the same level, but sales (i) increase by 20 percent and (ii) decrease by 20 percent, COMPUTE the earnings per share at the new sales level?

Solution:

Particulars	<u>(WN-1): Income statement</u>		
	Present	Sales Increase by 20%	Sales Decrease by 20%
Sales	340,000	408,000	272,000
- Variable Cost	(69,600)	(72,000)	(48,000)
Contribution	270,400	336,000	224,000
- Fixed Cost (Depreciation)	(60,000)	(60,000)	(60,000)
EBIT	210,400	276,000	164,000
- Interest	(60,000)	(60,000)	(60,000)
EAT	150,400	216,000	104,000
- Tax @ 35%	(56,000)	(75,600)	(36,400)
EAT / NP for ES	94,400	140,400	67,600
÷ NO OF ES (800,000 ÷ 10)	÷ 80,000	÷ 80,000	÷ 80,000
EPS	1.3	1.76	0.85

(WN-2): Tax Rate:

$$\frac{56,000}{1,60,000} \times 100 = 35\%$$

a) Leverages: (Current level)

$$\text{i) Operating Leverage} = \frac{\text{Contribution}}{\text{EBIT}} = \frac{280,000}{220,000} = 1.27 \text{ times}$$

$$\text{ii) Financial leverage} = \frac{\text{EBIT}}{\text{EBT}} = \frac{220,000}{160,000} = 1.38 \text{ times}$$

$$\text{iii) Combined leverage} = \frac{\text{Contribution}}{\text{EBT}} = \frac{280,000}{160,000} = 1.75 \text{ times}$$

b) EPS (Refer WN-1):

$$\text{i) IF sales increase by 20\%} = 1.76$$

$$\text{ii) IF sales decrease by 20\%} = 0.85$$

The following information is related to Yizi

Question 4. (Illustration 4)

The following information is related to Yizi Company Ltd. for the current Financial Year:

Equity share capital (of ₹ 10 each)	₹ 50 lakhs
12% Bonds of ₹ 1,000 each	₹ 37 lakhs
Sales	₹ 84 lakhs
Fixed cost (excluding interest)	₹ 6.96 lakhs
Financial leverage	1.49
Profit-volume Ratio	27.55%
Income Tax Applicable	40%

You are required to CALCULATE:

- (i) Operating Leverage;
- (ii) Combined leverage; and
- (iii) Earnings per share.

Show calculations up-to two decimal points.

Solution:

(WN-1): Income statement

Particulars	%	Total
Sales	100	8400000
- Variable cost	72.45	(6085800)
Contribution	27.55	2314200
- Fixed cost		(696000)
EBIT		1618200
- Interest (1618200 - 1086040)		532160
EBT (WN-2)		1086040
- Tax @ 40%		(434416)
EAT / NP for ES		651624
÷ NO OF ES (50,00,000 ÷ 10)		÷ 500000
EPS		1.30

(WN-2): EBT

financial leverage = $\frac{EBIT}{EBT}$
1.49 = $\frac{1618200}{EBT}$
∴ EBT = $\frac{1618200}{1.49} = 1086040$

i) Operating Leverage = $\frac{\text{Contribution}}{\text{EBIT}} = \frac{2314200}{1618200} = 1.43 \text{ times}$

ii) Combined Leverage = $\frac{\text{Contribution}}{\text{EBT}} = \frac{2314200}{1086040} = 2.13 \text{ times}$

iii) EPS = 1.30 (Refer WN-1).

The following particulars relating to Navya Ltd

Question 13. (PP 9)

The following particulars relating to Navya Ltd. for the year ended 31 st March is given:

Output	1,00,000 units at normal capacity
Selling price per unit	₹ 40
Variable cost per unit	₹ 20
Fixed cost	₹ 10,00,000

The capital structure of the company as on 31st March is as follows:

Particulars	₹
Equity share capital (1,00,000 shares of 10 each)	10,00,000
Reserves and surplus	5,00,000
7% debentures	10,00,000
Current liabilities	5,00,000
Total	30,00,000

Navya Ltd. has decided to undertake an expansion project to use the market potential, that will involve 10 lakhs. The company expects an increase in output by 50%. Fixed cost will be increased by 5,00,000 and variable cost per unit will be decreased by 10%. The additional output can be sold at the existing selling price without any adverse impact on the market.

The following alternative schemes for financing the proposed expansion programme are planned:

- (i) Entirely by equity shares of ₹ 10 each at par.
- (ii) ₹ 5 lakh by issue of equity shares of ₹ 10 each and the balance by issue of 6% debentures of ₹ 100 each at par.
- (iii) Entirely by 6% debentures of ₹ 100 each at par.

FIND out which of the above-mentioned alternatives would you recommend for Navya Ltd. with reference to the risk and return involved, assuming a corporate tax of 40%.

Solution:

(WN-1) : New shares & Interest.

Particulars	option 1	option 2	option 3
Equity Capital (10 each)	10,00,000	500,000	-
6% Debenture	-	500,000	10,00,000
Total	10,00,000	10,00,000	10,00,000

NEW :

NO OF ES	100,000	50,000	-
	(10,00,000 ÷ 10)	(500,000 ÷ 10)	
Interest on Debenture	-	30,000	60,000
		(500,000 × 6%)	(10,00,000 × 6%)

2. EBIT

Particulars	Current	After expansion	
Selling Price pu	40	40	(same)
- Variable Cost pu	(20)	(18)	(20 - 10%)
Contribution pu	20	22	
x No of units	x 100,000	x 150,000	(100,000 + 50%)
Contribution	20,00,000	33,00,000	
- Fixed Cost	(10,00,000)	(15,00,000)	(10,00,000 + 500,000)
EBIT	10,00,000	18,00,000	

3. Income Statement:

After Expansion.

Particulars	Current	Option 1	Option 2	Option 3
EBIT	10,00,000	18,00,000	18,00,000	18,00,000
- Interest	(7,00,000)	(7,00,000)	(10,00,000)	(13,00,000)
(Current: 10,00,000 x 7%)			(7,00,000 + 3,00,000)	(7,00,000 + 6,00,000)
EBT	9,30,000	17,30,000	17,00,000	16,70,000
- Tax @ 40%	(3,72,000)	(6,92,000)	(6,80,000)	(6,68,000)
EAT/NP for ES	5,58,000	10,38,000	10,20,000	10,02,000
÷ NO OF ES	÷ 100,000	÷ 200,000	÷ 150,000	÷ 100,000
(Current + New)		(100,000 + 100,000)	(100,000 + 50,000)	
EPS	5.58	5.19	6.8	10.02

OL = $\frac{\text{Contribution}}{\text{EBIT}}$	$\frac{20,00,000}{10,00,000}$	$\frac{33,00,000}{18,00,000}$	$\frac{33,00,000}{18,00,000}$	$\frac{33,00,000}{18,00,000}$
	2	1.83	1.83	1.83

FL = $\frac{\text{EBIT}}{\text{EBT}}$	$\frac{10,00,000}{9,30,000}$	$\frac{18,00,000}{17,30,000}$	$\frac{18,00,000}{17,00,000}$	$\frac{18,00,000}{16,70,000}$
	1.08	1.04	1.06	1.08

CL = OL x FL	2 x 1.08	1.83 x 1.04	1.83 x 1.06	1.83 x 1.08
	2.16	1.90	1.94	1.98

Risk : lowest lower than Highest
Option 3

Reward : lowest lower than Highest
Option 3

Recommendation:

1. Navya Ltd. is ready to take a high degree of risk, then alternative (iii) is strongly recommended.
2. In case of opting for less risk, alternative (ii) is the next best option with a reduced EPS of Rs. 6.80 per share.
3. In case of alternative (i), EPS is even lower than the existing option, hence not recommended.

Following are the selected financial information

Question 5. (Illustration 5)

Following are the selected financial information of A Ltd. and B Ltd. for the current Financial Year:

	A Ltd.	B Ltd.
Variable Cost Ratio	60%	50%
Interest	₹ 20,000	₹ 1,00,000
Operating Leverage	5	2
Financial Leverage	3	2
Tax Rate	30%	30%

You are required to FIND out:

- (i) EBIT
- (ii) Sales
- (iii) Fixed Cost
- (iv) Identify the company which is better placed with reasons based on leverages.

Solution:

(WN-1): Income Statement:

Particulars	A Ltd	B Ltd
Sales	100 375000	100 800,000
- Variable Cost	60 225000	50 400,000
Contribution (WN-3)	40 150,000	50 400,000
- Fixed Cost	120,000	200,000
EBIT (WN-2)	30,000	200,000
- Interest	(20,000)	(100,000)
EBT	10,000	100,000
- Tax @ 30%	(3000)	(30,000)
EAT	7000	70,000

(Q.N-2): EBIT

$$\text{Financial leverage} = \frac{\text{EBIT}}{\text{EBIT} - \text{Interest}}$$

A Ltd

$$3 = \frac{\text{EBIT}}{\text{EBIT} - 20,000}$$

$$3 \text{ EBIT} - 60,000 = \text{EBIT}$$

$$2 \text{ EBIT} = 60,000$$

$$\text{EBIT} = 30,000$$

B Ltd

$$2 = \frac{\text{EBIT}}{\text{EBIT} - 100,000}$$

$$2 \text{ EBIT} - 200,000 = \text{EBIT}$$

$$\text{EBIT} = 200,000$$

(Q.N-3): Contribution

$$\text{operating leverage} = \frac{\text{Contribution}}{\text{EBIT}}$$

A Ltd

$$5 = \frac{\text{Contribution}}{30,000}$$

$$\therefore \text{Contribution} = 150,000$$

B Ltd

$$2 = \frac{\text{Contribution}}{200,000}$$

$$\therefore \text{Contribution} = 400,000$$

	<u>Particulars</u>	<u>A</u>	<u>B</u>
1.	EBIT	30,000	200,000
2.	Sales	375,000	800,000
3.	Fixed Cost	120,000	200,000

4. Comment:

Company B is better than company A because of following reasons.

a) Interest coverage Ratio = (EBIT ÷ Interest)

Company A

$$\frac{30,000}{20,000} = 1.5 \text{ times}$$

Company B

$$\frac{200,000}{100,000} = 2 \text{ times}$$

Capacity of company B to pay interest is better than company A.

b) Financial Risk:

	<u>Company A</u>	<u>Company B</u>
Financial leverage	3 times	2 times

Company B has least financial risk.

A company had the following Balance Sheet

Question 12. (PP 7)

A company had the following Balance Sheet at the end of the current Financial Year:

Liabilities	(₹) in crores	Assets	(₹) in crores
Equity Share Capital (50 lakhs shares of ₹ 10 each)	5	Fixed Assets (Net)	12.5
Reserves and Surplus	1	Current Assets	7.5
15% Debentures	10		
Current Liabilities	4		
	20		20

The additional information given is as under:

Fixed cost per annum (excluding interest)	₹ 4 crores
Variable operating cost ratio	65%
Total assets turnover ratio	2.5
Income Tax rate	30%

Required :

CALCULATE the following and comment:

- (i) Earnings Per Share
- (ii) Operating Leverage
- (iii) Financial Leverage
- (iv) Combined Leverage

Solution:

<u>1. EPS</u>		(₹/mct)	<u>(WN-1): Sales</u>
Particulars		Total	Total Asset = $\frac{\text{Sales}}{\text{Total Asset}}$
Sales (WN-1)	100	50	Turnover ratio = $\frac{\text{Sales}}{20}$
- variable cost	65	(32.5)	$2.5 = \frac{\text{Sales}}{20}$
Contribution	35	17.5	$2.5 \times 20 = \text{Sales}$
- Fixed cost		(4)	$\therefore \text{Sales} = 50.$
EBIT		13.5	
- Interest (10 x 15%)		(1.5)	
EBT		12	<u>2. Operating leverage</u>
- Tax @ 30%		(3.6)	$\frac{\text{Contribution}}{\text{EBIT}} = \frac{17.5}{13.5}$
EAT/ NP for ES		8.4	= 1.30 times
÷ NO OF ES (5 ÷ 10)		÷ 0.5	
EPS		16.8	

3. Financial leverage:

$$\frac{\text{EBIT}}{\text{EBT}} = \frac{13.5}{12} = 1.13 \text{ times}$$

4. Combined leverage

$$\frac{\text{Contribution}}{\text{EBT}} = \frac{17.5}{12} = 1.46 \text{ times}$$

From the following information, prepare

Question 8. (PP 3)

From the following information, prepare Income Statement of Company A & B:

Particulars	Company A	Company B
Margin of safety	0.20	0.25
Interest	₹ 3,000	₹ 2,000
Profit volume ratio	25%	33.33%
Financial Leverage	4	3
Tax rate	45%	45%

Solution:

1. Income statement:

Particulars	Company A	Company B
Sales	100 (₹) 80,000	100 (₹) 36,000
- Variable Cost	75 (₹) 60,000	66.67 (₹) 24,000
Contribution (WN-3)	25 20,000	33.33 12,000
- Fixed Cost	16,000	9,000
EBIT (WN-1)	4,000	3,000
- Interest	(3,000)	(2,000)
EBT	1,000	1,000
- Tax @ 45%	(450)	(450)
EAT	550	550

(WN-1): EBIT

$$\text{Financial leverage} = \frac{\text{EBIT}}{\text{EBIT} - \text{Interest}}$$

Company A

$$4 = \frac{\text{EBIT}}{\text{EBIT} - 3000}$$

$$4 \text{ EBIT} - 12000 = \text{EBIT}$$

$$3 \text{ EBIT} = 12000$$

$$\text{EBIT} = 4000$$

Company B

$$3 = \frac{\text{EBIT}}{\text{EBIT} - 2000}$$

$$3 \text{ EBIT} - 6000 = \text{EBIT}$$

$$2 \text{ EBIT} = 6000$$

$$\text{EBIT} = 3000$$

(WN-2): Operating leverage:

Particulars	Company A	Company B
Operating Leverage = $\frac{1}{\text{MOS Ratio}}$	$\frac{1}{0.20}$	$\frac{1}{0.25}$
	5	4

(Q11-9): Contribution

$$\text{operating leverage} = \frac{\text{Contribution}}{\text{EBIT}}$$

company A

$$5 = \frac{\text{Contribution}}{4000}$$

$$\begin{aligned} \text{Contribution} &= 5 \times 4000 \\ &= 20,000 \end{aligned}$$

company B

$$4 = \frac{\text{Contribution}}{3000}$$

$$\begin{aligned} \text{Contribution} &= 4 \times 3000 \\ &= 12000 \end{aligned}$$

Extra

$$1.3 = \text{BEP} + \text{MOS}$$

$$1 = 0.8 + 0.2$$

"?"

$$\begin{array}{ccc} (3) & \times & 16000 \\ 80,000 & & | \end{array}$$

$$\text{MOS} = \frac{\text{profit}}{\text{sales}}$$

$$= \frac{4000}{25\%}$$

$$= 16000$$

Logic

Example:

	BEP	+ mos	=	Total sales
SP 10 pu				
VC (8) pu				
Contribution 2 pu				
Fixed cost = 800				
PV Ratio = 20%				
	Sales	4000	6000	10,000
	x PV Ratio	x 20%	x 20%	x 20%
	Contribution	800	1200	2000
	- Fixed cost	800	-	(800)
	Profit (EBIT)	-	1200	1200

$$\text{BEP} + \text{mos} = \text{Total sales}$$

$$4000 + 6000 = 10,000$$

$$\text{mos Ratio} = \frac{\text{mos sales} \times \text{PV Ratio}}{\text{Total sales} \times \text{PV Ratio}}$$

$$\therefore \text{mos Ratio} = \frac{\text{mos sales}}{\text{Total sales}} \times 100$$

$$= \frac{6000}{10,000} \times 100$$

$$= 60\% \text{ or } 0.6$$

$$\text{mos Ratio} = \frac{\text{EBIT}}{\text{Contribution}}$$

$$\frac{1}{\text{mos Ratio}} = \frac{\text{Contribution}}{\text{EBIT}}$$

↓
OL

$$\frac{1}{\text{mos Ratio}} = 0.6$$

The Sale revenue of TM excellence Ltd.

Question 10. (PP 5)

The Sale revenue of TM excellence Ltd. @ ₹ 20 Per unit of output is ₹ 20 lakhs and Contribution is ₹ 10 lakhs. At the present level of output, the DOL of the company is 2.5. The company does not have any Preference Shares. The number of Equity Shares are 1 lakh. Applicable corporate Income Tax rate is 50% and the rate of interest on Debt Capital is 16% p.a. CALCULATE the EPS (at sales revenue of ₹ 20 lakhs) and amount of Debt Capital of the company if a 25% decline in Sales will wipe out EPS.

Solution:1. EPS:

Particulars	Total
Sales	20,00,000
- Variable Cost	10,00,000
Contribution	10,00,000
- Fixed Cost	600,000
EBIT (WN-1)	400,000
- Interest	150,000
EBT (WN-3)	250,000
- Tax @ 50%	(125,000)
EAT / NP for ES	125,000
÷ No of ES	÷ 1,00,000
EPS	1.25

(WN-1): EBIT

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

$$2.5 = \frac{10,00,000}{\text{EBIT}}$$

$$\text{EBIT} = \frac{10,00,000}{2.5}$$

$$\text{EBIT} = 400,000$$

(WN-2): Combined leverage:

- Wipe out means 100% reduction.
- 25% reduction in sales leads to 100% reduction in EPS.

$$\text{Combined leverage} = \frac{\% \Delta \text{EPS}}{\% \Delta \text{Sales}}$$

$$= \frac{100}{25}$$

∴ Combined leverage = 4 times

$$\text{EBT} = \frac{10,00,000}{4} = 250,000$$

2. Debt Amount:

$$\text{Debt} \times 16\% = \text{Interest}$$

$$\text{Debt} = \frac{\text{Interest}}{16\%}$$

$$\text{Debt} = \frac{150,000}{16\%}$$

$$= 937500$$

(WN-3): EBT

$$\text{Combined leverage} = \frac{\text{Contribution}}{\text{EBT}}$$

$$4 = \frac{10,00,000}{\text{EBT}}$$

CALCULATE the operating leverage for each of the four firms

Question 2. (Illustration 2)

CALCULATE the operating leverage for each of the four firms A, B, C and D from the following price and cost data:

	Firms			
	A (₹)	B(₹)	C(₹)	D(₹)
Sale price per unit	20	32	50	70
Variable cost per unit	6	16	20	50
Fixed operating cost	60,000	40,000	1,00,000	Nil

What calculations can you draw with respect to levels of fixed cost and the degree of operating leverage result? EXPLAIN. Assume number of units sold is 5,000

Solution:

(WN-1): Income statement:

Particulars	A	B	C	D
Selling Price p.u.	20	32	50	70
- Variable cost p.u.	(6)	(16)	(20)	(50)
Contribution p.u.	14	16	30	20
x NO OF UNITS	x5000	x5000	x5000	x5000
Total Contribution	70,000	80,000	150,000	100,000
- Fixed cost	(60,000)	(40,000)	(100,000)	-
EBIT	10,000	40,000	50,000	100,000

1. Operating leverage

Particulars	A	B	C	D
Contribution	70,000	80,000	150,000	100,000
EBIT	10,000	40,000	50,000	100,000
	7	2	3	1

Comments:

- Operating leverage exists only if there is fixed cost.
- Operating leverage of firm D is 1, it means 1% change in sales will lead to 1% change in EBIT. (i.e. no magnified impact)
- In case of other firms it exists in following order.
 - Firm A = 7 times
 - Firm C = 3 times
 - Firm B = 2 times
- In case of Firm A it is 7, it means 1% change in sales leads to 7% change in EBIT.

The following details of a company for the year

Question 14. (PP 10)

The following details of a company for the year ended 31st March are given below:

Operating leverage	2:1
Combined leverage	2.5:1
Fixed Cost excluding interest	₹ 3.4 lakhs
Sales	₹ 50 lakhs
8% Debentures of ₹ 100 each	₹ 30.25 lakhs
Equity Share Capital of ₹ 10 each	34 lakhs
Income Tax Rate	30%

CALCULATE:

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

Solution:

(WN-1): Income Statement:

Particulars	Total
Sales	50,00,000
- Variable Cost	43,20,000
Contribution (WN-2)	6,80,000
- Fixed Cost	(3,40,000)
EBIT	3,40,000
- Interest	6,80,000
EBT (WN-3)	2,72,000
- Tax @ 30%	81,600
EAT	1,90,400
∴ No of Es (34,00,000 ÷ 10)	3,40,000
EPS	0.56

(WN-2): Contribution.

$$\text{Operating Leverage} = \frac{\text{Contribution}}{\text{Contribution} - \text{FC}}$$

$$2 = \frac{\text{Contribution}}{\text{Contribution} - 3,40,000}$$

$$2 \text{ Contribution} - 6,80,000 = \text{Contribution}$$

$$\therefore \text{Contribution} = 6,80,000$$

(WN-3): EBT

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

$$1.25 = \frac{3,40,000}{\text{EBT}}$$

$$\therefore \text{EBT} = \frac{3,40,000}{1.25} = 2,72,000$$

1. Financial leverage

$$\text{Combined Leverage} = \text{Operating Leverage} \times \text{Financial Leverage}$$

$$2.5 = 2 \times \text{Financial Leverage}$$

$$\therefore \text{Financial Leverage} = \frac{2.5}{2} = 1.25$$

$$\text{ii) a) PY Ratio} = \frac{\text{Contribution}}{\text{Sales}} \times 100 = \frac{680000}{5000000} \times 100 = 13.6\%$$

$$\text{b) EPS} = 0.56 \text{ (Refer WN-7)}$$

$$\begin{aligned} \text{iii) a) Total Asset} &= \text{Equity share capital} + 8\% \text{ Debenture} \\ &= 3400000 + 3025000 \\ &= 6425000 \end{aligned}$$

$$\begin{aligned} \text{b) Total Asset Turnover Ratio} &= \frac{\text{Sales}}{\text{Total Assets}} \\ &= \frac{5000000}{6425000} \\ &= 0.78 \end{aligned}$$

c) Company has low asset turnover as compared to Industry

iv) Sales Amount where EBT = zero:

Sales	100	30,00,000
- variable Cost	86.4	2592000
contribution	13.6	408000
- Fixed Cost		(340000)
EBIT		68000
- Interest		(68000)
EBT		-

Extra: ICAI

EBIT	340000
- Interest	242000 (3025000 × 8%)
EBT (WN-3)	98000
- Tax @ 30%	(29400)
EAT	68600
∴ NO OF ES (3400000 ÷ 10)	340000
EPS	0.20