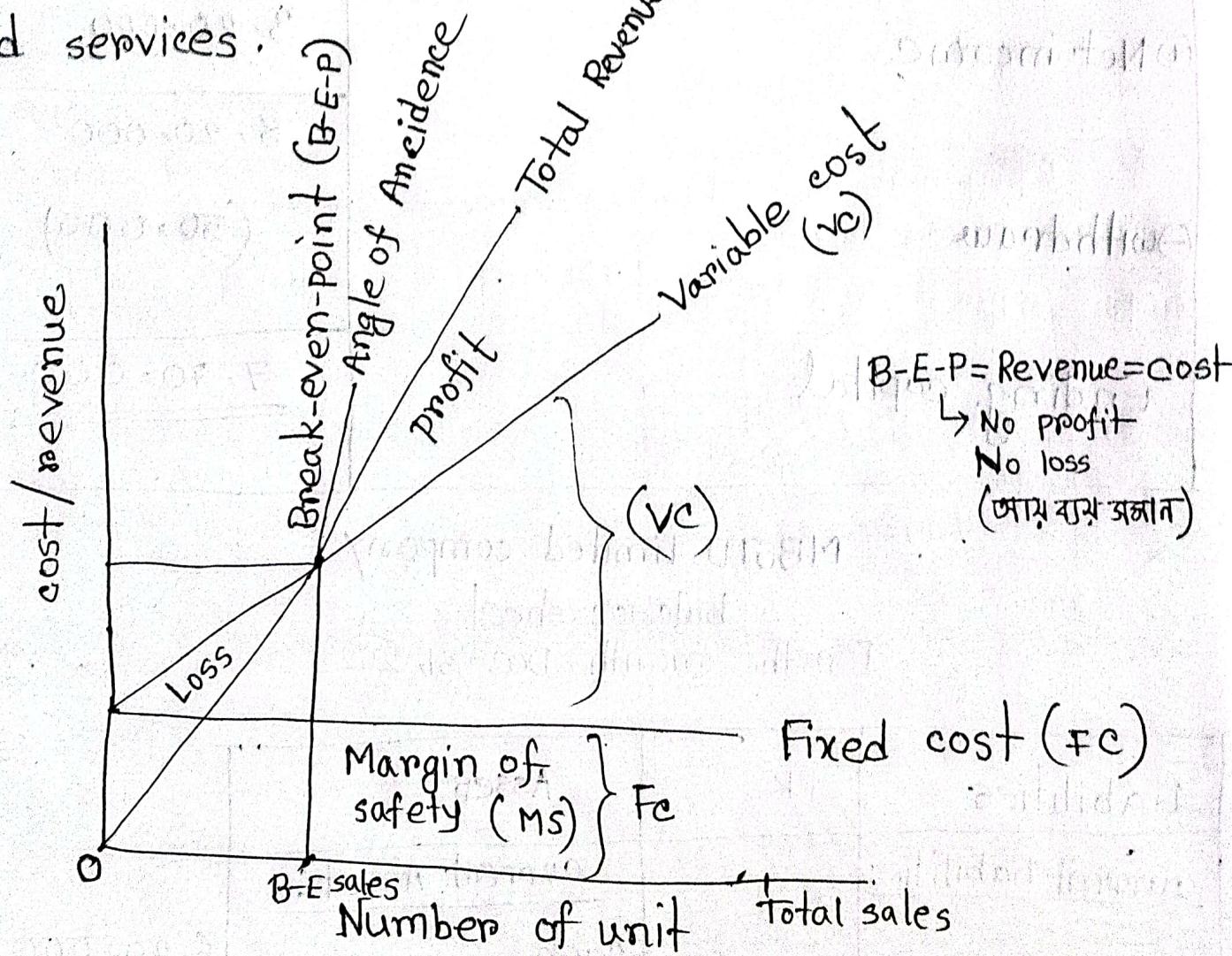


C-V.P

Cost-volume-profit

It is relationship between cost incurred to manufacture goods or services and volume of goods and services produced and profit earn by selling those goods and services.



$$\text{Total sales} - \text{Break-even sales} = \text{Margin of safety}.$$

✓ Graph আসতে

Sales -	100,000	from box + labor
variable cost (vc)	30,000	(91%) other important contributions
Contribution margin (cm)	70,000	from box + labor
Fixed cost	25,000	from box + labor
Net income	45,000	(time)

Formula:

- ① Contribution margin (cm) = Sales - variable cost
- ② Profit = Sales - variable cost - Fixed cost
- ③ Contribution margin ratio = $\frac{\text{Total contribution margin}}{\text{Sales}}$
(TK)

$$= \frac{\text{Sales} - \text{variable cost}}{\text{Sales}}$$

- ④ Margin of safety (MS) = Total actual sales - Break-even sales
(unit)

$$\textcircled{v} \text{ Margin of safety Ratio} = \frac{\text{Margin of Safety}}{\text{Sales}}$$

$$\textcircled{vi} \text{ Break-even-point} = \frac{\text{Total Fixed cost}}{\text{Contribution margin per unit}}$$

$$(B-E-P) \text{ (unit)}$$

$$(CM P/U)$$

$$\textcircled{VII} \quad B-E-P = \frac{\text{Total Fixed cost}}{\text{Contribution margin ratio (CMR)}}$$

$$\textcircled{VIII} \quad \text{Target profit} = \frac{\text{Fixed cost} + \text{Target profit}}{\text{CM P/U}}$$

$$\textcircled{IX} \quad T. \text{ profit} = \frac{\text{Fixed cost} + \text{Target profit}}{\text{CMR}}$$

$$\textcircled{X} \quad \text{Degree of operating leverage} = \frac{\text{Contribution margin}}{\text{Net operating income}}$$

Assumptions of CVP Analysis / Limitations of CVP

Analysis:

1. Selling price is constant.
2. Variable cost per unit will be fixed.
3. Fixed cost remains constant.
4. Total cost is suggested to be fixed.
5. In multiproduct company, The sales mix is constant.

What are the factors that are affected by CVP Analysis?

1. Selling prices
2. Sales volume
3. Unit variable cost
4. Total fixed cost
5. Mix of products sold.

Pdf Q. solve

	Per unit	
Sales (20,000 unit)	\$ 60	100%
Variable expenses	45	?
Contribution margin	\$ 15	
Fixed expenses	240000	
Net income	60000	

Req-1:

contribution margin

CM Ratio

$$= \frac{3,00,000}{1200,000}$$

$$= 0.25$$

$$= 25\%$$

CM per unit
 Sales per unit

$$= \frac{15}{60}$$

$$= 0.25$$

$$= 25\%$$

variable expense Ratio = $\frac{\text{Variable expense}}{\text{Sales}}$

$$= \frac{900000}{1200000}$$

$$= 0.75$$

$$= 75\%$$

Req - 2

$$\text{B-E-P unit} = \frac{\text{Total cost}}{\text{contribution margin per unit}}$$

$$= \frac{2,40,000}{15}$$

$$= 16,000 \text{ units}$$

$$\text{B-E-P(TK)} = \frac{\text{Fixed cost}}{\text{contribution margin ratio}}$$

$$= \frac{24,000}{0.25} \\ = 96,000 \text{ TK.}$$

check
16000 × 60
= 96,000

Req - 3

Increase sales 4,00,000

multiply by CM ratio 0.25

Net income increase 1,00,000

Net operating income increase by TK 1,00,000 due to cost behaviour pattern is unchanged.

Req - 4

$$\text{Target profit} = \frac{\text{Fixed cost} + \text{Target profit}}{\text{CM p/u}}$$

$$= \frac{2,40,000 + 9,000}{15}$$

$$= \frac{3,30,000}{15}$$

$$= 22000 \text{ units}$$

Req - 5

$$\text{Margin of safety} = \text{actual sales} - \text{Break-even sales}$$

(MS)

$$= 12,00,000 - 9,60,000$$

$$= \text{TK } 2,40,000$$

$$\text{Margin of safety Ratio} = \frac{\text{Margin of safety}}{\text{Sales}}$$

$$= \frac{240000}{1200000}$$

$$= 20\%$$

$$\text{Degree of operating leverage} = \frac{\text{contribution margin}}{\text{Net operating income}}$$

$$= \frac{3,00,000}{60,000}$$

$$= 5.$$

pdf 8.12

Sales	TK 4,50,000	P. unit 30
VC	1,80,000	12
CM	2,70,000	18
fixed exp	2,16,000	
	54,000	

$$\text{CM ratio} = \frac{\text{sales} - \text{vc}}{\text{sales}}$$

$$= \frac{30 - 12}{30}$$

$$= \frac{18}{30}$$

$$= 0.60$$

$$= 60\%$$

Req-1:

$$\text{B-E-P (unit)} = \frac{\text{Fixed cost}}{\text{CM P/u}}$$

$$= \frac{2,16,000}{(30 - 12)}$$

$$= \frac{2,16,000}{18}$$

$$= 12,000 \text{ units}$$

$$\text{B-E-P (TK)} = \frac{\text{fixed cost}}{\text{CM ratio}}$$

$$= \frac{21,600}{(30 - 12)}$$

$$= \frac{21,600}{18}$$

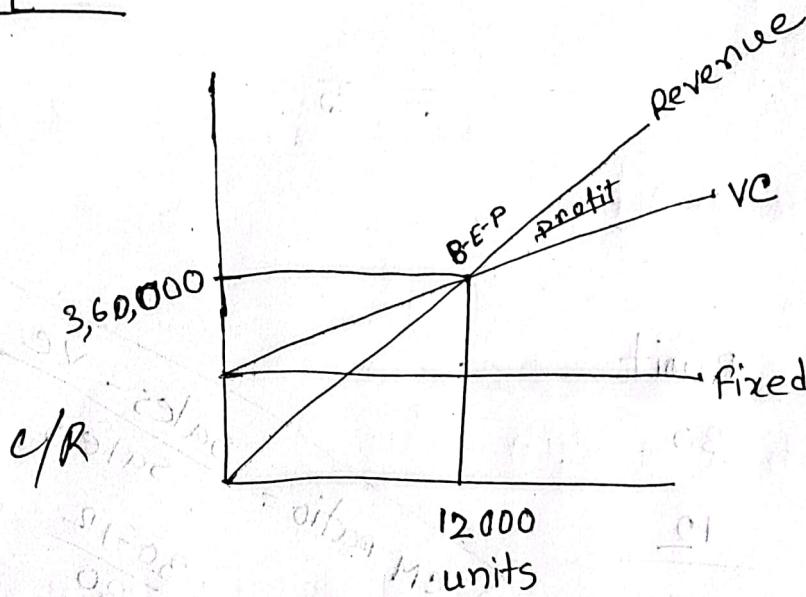
$$= \frac{31,600}{0.60}$$

$$= \text{TK } 360000$$

B.E.P check

$$12000 \times 30 \\ = 3,60,000$$

Req-2:



Req-3:

$$\text{Target profit} = \frac{\text{Fixed cost} + \text{Target profit}}{\text{CM per unit}}$$

$$= \frac{2,16,000 + 90000}{(30 - 12)}$$

$$= \frac{306000}{18}$$

$$= 17000 \text{ unit}$$

sales (17000×30)	5,10,000
variable cost (17000×12)	2,04,000
contribution margin	<u>3,06,000</u>
(-) Fixed cost	2,16,000
Net income	<u><u>90,000</u></u>

6-8

O.S	
S.P	30 per unit
V.E	20 " "
Fixed exp.	7500 " "
unit sales	1660 per month

i. Margin of safety = Actual sales - Break even sales

$$\begin{aligned}
 &= 30,000 - 22500 \\
 &= 7500
 \end{aligned}$$

Note:
Actual sales (1000×30)
 $= 30000$

$$\textcircled{i} \quad \text{B-E sales} = \frac{\text{Total fixed cost}}{S.P - V.P}$$

$$= \frac{7500}{30-20}$$

$$= 750 \text{ unit} \times 30 \\
 = 22500 \text{ TK}$$

বিষয়

$$\frac{7500}{(10/30)} = 22500 \text{ TK}$$

$$\textcircled{1} \text{ Margin of safety Ratio} = \frac{\text{Margin of safety}}{\text{Sales}}$$

$$= \frac{7500}{30000} = 0.25 \\ = 25\%$$

Q

<u>Sale</u>	<u>TK</u>	<u>%</u>
Sale	80000	100 %
V. exp.	32000	+40%
CM	48000	<u>60%</u>
Fixed exp.	3800	
Net operating income	<u>10000</u>	

Req 1:

$$\text{Degree of operating leverage} = \frac{\text{contribution margin}}{\text{Net operating income}}$$

$$= \frac{(80000 - 32000)}{10000}$$

$$= \frac{48000}{10000}$$

$$\text{Degree of operating leverage} = 4.8$$

Req 2:

We know from req-1:

$$\text{Degree of operating leverage} = 4.8$$

Then, given it sales increase

5%

so, Net operating will be = Degree of operating leverage
increase in sales

$$= 4.8 \times 5\%$$

$$= \underline{\underline{24\%}}$$

Req 3

Sales	TK 84000	% 100%
V. exp	33600	40%
contribution margin	50400	60%
Fixed exp.	38000	
Net operating income	<u>12400</u>	

Now,

original operating income @ 10,000

change in operating income @ 12,400

So, change in operating income

$$\text{so, change in operating income} @ = 12400 - 10,000 \\ = 2400$$

\therefore Impact on operating income = $c \div a$

$$= 2400 \div 10,000$$

$$= 0.24$$

$$= 24\%$$