



**CLASSES**

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# Marginal Costing

## **Before we go into Marginal costing, Let's first understand what is Cost.**

Cost is what we need to pay to get something.

In business, cost is the amount that we are paying to run the business.

Cost are of two types. One is the fixed cost and another one is the variable cost.

Fixed cost is that cost, which will remain fixed and we need to pay that even when the production is stopped. We don't pay the variable cost when we stop our production.

For Ex. Rent of the factory, Salaries of the employees, Interest on loan. These are all fixed costs. They are fixed because they will not change. The rent will not change over a period of time, so is the salary of employees and the interest on loan taken.

We know the rent of the next month. We know the salaries that we need to pay to our employees, we know the interest amount that we need to pay on loan. So, our fixed cost we know it.

Now let's talk about our variable cost.

Variable cost is that cost which is not fixed. It will increase if the production is increased and decrease if the production is decreased.

For E.g. The cost of the raw material we are purchasing, the cost of electricity.

These cost are called as variable as these cost vary with the output. Higher the output, higher will be the variable cost. On the other hand, there is no effect of output on the fixed cost as even there is no production during a month, you still need to pay the rent and the salaries.

Let's talk about What is Marginal costing and how it helps?

Let me tell you how marginal costing through an example.

Let's say I am running a Samosa shop. I am selling samosa for Rs. 20 per unit. My fixed expenses for a month in terms of rent, salaries, electricity are 36,000. The manufacturing cost i.e. the cost of ingredients to prepare a samosa are say Rs. 8 per unit.

Now through marginal costing I have answers to the various questions like.

Ques. 1:- What I am getting from selling a samosa. Its Selling price – Variable cost –  
 $20 - 8 = \text{Rs. } 12$

So, I am getting 12 Rs. Per samosa and suppose I sell 200 samosa daily, then I am getting  $12 * 200 = 2,400$  Rs. Which is  $30 \text{ days} * 2400 = 72,000$  Rs.

Now if I will deduct 36,000 as my fixed cost, I have a profit of Rs. 72,000-36,000=36,000 per month.

Q2: What is the minimum quantity of samosa that I need to sell to cover my fixed cost.

Ans: The formula for that is 
$$\frac{\text{Fixed cost}}{\text{Selling price} - \text{Variable Cost}} = \frac{36,000}{20-8} = 3000 \text{ i.e.}$$
$$3000/30=100 \text{ samosa a day.}$$

So on daily basis, I know how much profit I am earning. If I sold only 100 samosa today, I am at no profit no loss.

If I sold 120 samosa, I know, I have earned a profit of 20 samosa \*Rs. 12 = 2400

So these kind of analysis and a lot more we get from the technique of marginal costing.

## **Why is it called Marginal costing?**

Marginal costing is also called as Variable costing. It is called as Marginal or Variable as the focus of this costing is entirely on Marginal/ Variable cost.

Let's discuss the further questions to give us more clarity on how marginal costing helps.

# Marginal Costing

Ques. 1-10



<b>Q1:</b>	1st Half	2nd Half
Sales	1,00,000	1,20,000
Profit	30,000	38,000

Fc during the 1st half is equal to that during the 2nd half. S.P & VC per unit will remain unchanged.

Compute:-

- P/V ratio for each half & for the year.
- Fixed cost for each half & for the year.
- BEP for each half & for the year.
- Half yearly sales to earn half yearly profit of Rs.40000.
- Annual Sales to earn annual profit of Rs 90000.

**ANS (a) 40%; (b) Annual Fixed Cost:20000,BES for the year:50000;  
(d)125000;(e)275000**

**(a) Let's understand first what is P/V ratio.**

Profit-volume ratio indicates the relationship between contribution and sales and is usually expressed in percentage.

**What is contribution?**

The excess of Sales- variable cost is called as contribution. The higher it is, the higher will be the profits and vice versa.

Let's say our selling price per unit is 100 and the variable cost per unit is 60. So, our contribution will be  $100 - 60 = 40$  i.e. for every one unit sold, we are getting a contribution of Rs. 40.

So, the P/V ratio will be  $= \frac{40}{100} * 100 = 40\%$

Which means if we do a sales of 10,000 we will get a contribution of  $10,000 * 40\% = 4,000$   
And if our Sales are say 250,000 our contribution will be  $250,000 * 40\% = 100,000$ .

So P/v ratio helps in giving us a straight figure of how much we have earned after subtracting our variable cost.

## **To know more about P/V ratio Just in case you wanted to understand more:-**

P/v ratio is influenced by sales and variable or marginal cost. If the sale price increases without a corresponding increase in marginal cost, the contribution increases—and the profit-volume ratio improves. Similarly, if the marginal cost is reduced with sale price remaining same— profit-volume ratio improves.

### **Uses of P/V Ratio:**

- (i) It helps in the determination of Break-even-point [ $\text{BEP} = \text{Fixed cost} \div \text{P/V ratio}$ ]
- (ii) It helps in the determination of profit at any volume of sales
- (iii) It helps in the determination of sales to earn a desired amount of profit
- (vi) It helps in determining margin of safety [ $\text{Margin of safety} = \text{Profit} \div \text{P/V ratio}$ ]

**P /V ratio** =  $\frac{\text{Contribution}}{\text{Sales}} * 100$  if we want in % terms.

and

**P /V ratio** =  $\frac{\text{Contribution per unit}}{\text{Selling price per unit}}$  if we want in per unit terms.

There is another formula for P/v ration that to be used only when we are given Sales and Profit of two years or two half years like in **Q1**.

**P /V ratio** =  $\frac{\text{Change in Profit}}{\text{Change in Sales}} * 100$

**Q1**

**(a)**

$$\text{P /V ratio} = \frac{\text{Change in Profit}}{\text{Change in Sales}} * 100$$

$$= \frac{8,000}{20,000} * 100$$

Now for (b) part:-

Profit = Sales – Variable cost – Fixed cost

$$\text{Now Sales} * \text{P/v ratio} = S * \frac{C}{S} = C$$

so we can use this formula to get the contribution using Sales and P/v ratio

and using the above we can get C – profit = Fixed cost

<b>(b)</b>	$(\text{Sales} * \text{P/v ratio}) - \text{Profit} = \text{FC}$
	$(100,000 * 40\%) - 30,000 = 10,000$
	<b>Fixed cost = 10,000</b>
	<b>Annual Fixed cost = 10,000*2= 20,000</b>

## **Lets understand What is Break even Sales before solving the next part.**

It is that amount of sales at which there is no profit no loss i.e. our costs are equal to the sales amount.

This is the initial sales which is required to cover our fixed cost.

By relating to the example I have given in the initial slides where I was talking about the Samosa business, The break even sales was 150 samosa daily or  $100 \times 30 = 4500$  samosa a month.

### **Break even sales in Rs. terms**

$$= 3000 \text{ units} * \text{Rs. } 20 = 60,000$$

So at Rs. 60,000 sales a month, there will be no profit no loss. If the sales are below this amount say 55,000 then there is a loss of 5,000 and if the sales are say 70,000, then there is a profit of 10,000.

$$\text{Check } 3000 * 20 = 60,000 - \text{Variable cost } 3000 * 8 - \text{Fixed cost } 36,000 = \text{ZERO}$$

## Formula for Break Even Sales

$$\text{Break even Sales} = \frac{\text{Fixed Cost}}{\text{P/V ratio}}$$

**Why this formula?**

**Let me explain:-**

We know that Sales \* P/v ratio = C---(1)

$$\text{Sales} = \frac{\text{Contribution}}{\text{P/V ratio}} = \frac{\text{Fixed cost} + \text{Profit}}{\text{P/V ratio}}$$

Now at zero profit, all the Sales are called as Break even sales so the above formula become

$$\text{Break even Sales} = \frac{\text{Fixed cost}}{\text{P/V ratio}}$$



<b>(C)</b>	Break even Sales = $\frac{\text{Fixed Cost}}{\text{P/V ratio}}$	$= \frac{10,000}{40\%} = 25,000$
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Annual Break even Sales = 25,000 \* 2 half years = 50,000

**We know the formula:-**  $\text{Sales} = \frac{\text{Contribution}}{\text{P/V ratio}}$   
 $= \frac{\text{Fixed cost} + \text{Profit}}{\text{P/V ratio}}$

**Now for the last part:-**

Now if want to know how much sales we needed for this much of profit we just need to change the fig. of profit and then we will get the required sales as all other components i.e. fixed cost and the p/v ratio will remain constant.

**So the formula for Required Sales will become**  
 $= \frac{\text{Fixed cost} + \text{Profit}}{\text{P/V ratio}}$

<b>(d)</b>	$\text{Required Sales} = \frac{\text{Fixed Cost} + \text{Profit}}{\text{P/V ratio}} = \frac{10,000 + 40,000}{40\%} = 125,000$
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<b>(e)</b>	$\text{Required Sales} = \frac{\text{Fixed Cost} + \text{Profit}}{\text{P/V ratio}} = \frac{20,000 + 90,000}{40\%} = 2,75,000$
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**Q2: (H.W.) From the following information**

Find: P/V ratio;

Break even sales;

Profit when sales are Rs.18,00,000;

Sales required to earn a profit of Rs.120,000,

Margin of safety for 2007.

Year	Sales	Profit
2007	12,00,000	80,000
2008	14,00,000	1,30,000

**ANS: 25%; 880,000; 230,000; 1360,000; 320,000**

**Q3:** (a) A company earned a profit of Rs.30,000 during the year. If the marginal cost and SP of a product are Rs.8 and Rs. 10 per unit respectively, find out the amount of margin of safety.

(b) If Margin of safety is Rs.240,000 (40% of sales) and P/V ratio is 30% of sales of XY ltd. Calculate BEP & amount of profit on sales of Rs.900,000

**ANS: 150,000 & 108,000, 162,000**

## What is margin of safety?

We already know that  $\text{Sales} = \frac{\text{Contribution}}{\text{P/V ratio}} = \frac{\text{Fixed cost} + \text{Profit}}{\text{P/V ratio}}$

Or breaking the numerator,

$\text{Total Sales} = \frac{\text{Fixed cost}}{\text{P/V ratio}} + \frac{\text{Profit}}{\text{P/V ratio}}$

**Or Total Sales = Break even Sales + Margin of safety.**

**So Margin of safety =  $\frac{\text{Profit}}{\text{P/V ratio}}$**

## What is margin of safety?

Margin of safety is that sales which is achieved after the initial sales called as Breakeven Sales.

At Break even Sales, our fixed cost are fully absorbed or recovered, so beyond the break even sales, whatever is the contribution, its just the profit as there is no fixed cost.

And so the formula for Margin of safety is  $\frac{\text{Profit}}{\text{P/V ratio}}$

**Q3 (a)**

SP	10
Less: VC	8
Contribution	2
P/V Ratio=	$=\frac{2}{10} * 100 = 20\%$
Margin of safety = $\frac{\text{Profit}}{\text{P/V ratio}}$	$=\frac{30,000}{20\%} = 150,000$



Margin of safety = 2,40,000 = 40% of Sales

$$\text{Sales} = \frac{2,40,000}{40\%} = 600,000$$

**Q3 (b)**

Break even Sales + Margin of Safety = Total Sales

$$\text{Break even Sales} = 600,000 - 240,000 = 360,000$$

$$\text{Break even Sales} = 360,000 = \frac{\text{Fixed Cost}}{\text{P/V ratio}}$$

$$\text{Fixed cost} = 360,000 * 30\% = 108,000$$

Profit = Sales \* P/V ratio - Fixed Cost

$$900,000 * 30\% - 108,000 = 162,000$$

**Q4:** - A ltd budgets production of 10,000 units. The VC is estimated @12 per unit. The fixed costs are estimated to be 40,000. The SP is fixed to earn a profit of 25% profit on cost.

You are required to:

- I) Compute BEP in terms of units and sales.
- II) Compute how many units must be produced and sold to earn a profit of Rs.60, 000

**ANS:100,000, 5000 units & 12,500 units**

**Q4**  
**(I)**

$$\text{BEP} = \frac{\text{Fixed cost}}{\text{Contribution per unit}}$$

$$= \frac{40,000}{8} = 5,000 \text{ units or } 5,000 * 20 = \text{Rs. } 100,000$$

**(II)**

$$\text{Required Sales} = \frac{\text{Fixed Cost} + \text{Profit}}{\text{Contribution per unit}}$$

$$= \frac{40,000 + 60,000}{8} = 12,500 \text{ units}$$

**Note:**

**Contribution per unit:-**

$$\text{VC} = 10,000 \text{ units} * 12 = 120,000$$

$$\text{FC} = 40,000$$

$$\text{Total Cost} = 160,000$$

$$\text{Add: Profit} = 25\% \text{ of Cost} = 40,000$$

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

$$\text{SP per unit} = 200,000 / 10,000 \text{ units} = \text{Rs. } 20$$

$$\text{Contribution per unit} = 20 - 12 = 8$$

**Q5:- (a)** Sale of a product amounts to 4,000 units p.m. @Rs.10 per unit. Fixed overheads are Rs.8,000 & Variable cost is Rs.6 per unit. The manufacturer proposes to reduce selling price by 10%. Calculate the present & future P/v ratio and find out how many units must be sold to maintain the same profit.

**(b)** A company earned a profit of Rs.60,000 during the year 07-08. If the marginal cost & the SP of a product are Rs.8 and Rs. 10 per unit resp., find out margin of safety.

**ANS:40%, 33-1/3%, 8,000 units, 300,000**

**Q5 (a)**

$$\text{Current P/V ratio} = \frac{4}{10} * 100 = 40\%$$

$$\text{Future P/V ratio} = \frac{9-6}{9} * 100 = 40\%$$

$$\text{Current profit} = 4 * 4,000 \text{ units} = 16,000$$

$$\text{Required Sales} = \frac{\text{Fixed Cost} + \text{Profit}}{\text{Contribution per unit}} = \frac{16,000 + 8,000}{3} = 8,000 \text{ units}$$

**Q5 (b)**

$$\text{Margin of safety} = \frac{\text{Profit}}{\text{P/V ratio}} = \frac{60,000}{20\%} = \text{Rs. } 300,000$$

**Q6:** ABC Ltd produces a variety of products each having a no. of components parts. Product B takes 5 hours to produce on a particular machine which is working at full capacity. B has a SP of Rs. 100 & VC of Rs. 60 per unit.

A component part X -100 could be made on the same machine in 2 hours at a VC of Rs. 10 per unit.

The supplier price for the component is Rs. 25 per unit. Advice whether the company should buy the component X-100.

**ANS: Should be bought.**

**Ans:** To take a decision on whether we should buy this Part X or we manufacture this, we have to check the buying cost of this part vs. the manufacturing cost.

If the manufacturing cost is lower, we will not buy and vice versa.

Now if this part X is manufactured, we won't be manufacturing the product B. So real manufacturing cost of Part X would be the variable cost of part X + the contribution foregone of Product B

<b>Product B</b>	
SP	100
Less: VC	60
Contribution per unit	40
Contribution per hour	$\frac{40}{5} = \text{Rs. } 8$

<b>Part X</b>	
VC	10
Add: Contribution foregone (Rs.8*2hours)	16
Manufacturing Cost	26
Supplier price	25

**Advice: It is better to buy Part X from them market as the buying cost is lower than the manufacturing cost.**



**Q7:** (a) Total fixed cost: 12,000

Contribution-20,000

No of unit's sold-10,000

Variable cost is 60% of sales

Determine the SP per unit and also the total profit& loss

**ANS: Rs.5 and 8,000**

(b) Total fixed cost: 12,000

Annual sales: 48,000

Margin of Safety-8,000

Find P/V ratio

**ANS: 30%**

(C) When output is 3,000 units, the average cost per unit is Rs.4. When output is 4,000 units, the avg cost is Rs.3.50 per unit. The BEP is 5,000 units. Find P/V ratio.

**ANS: 37.50%**

Fixed cost = 12,000

Contribution = 20,000

Profit = Contribution - Fixed cost

**Q7(a)**

Profit = 20,000 - 12,000 = 8,000

VC = 60% of Sales, So P/V Ratio = 40% of Sales

Sales =  $\frac{\text{Contribution}}{\text{P/V ratio}} = \frac{20,000}{40\%} = 50,000$

SP per unit =  $\frac{50,000}{10,000} = \text{Rs. } 5$

**Q7(b)**

Fixed cost	12,000
Annual Sales	48,000
Margin of Safety	8,000
Break even Sales = 48,000 - 8,000 = <b>40,000</b>	
Break even Sales = $\frac{\text{Fixed Cost}}{\text{P/V ratio}}$	$40,000 = \frac{12,000}{\text{P/V ratio}}$
$\text{P/V ratio} = \frac{12,000 * 100}{40,000} = \mathbf{30\%}$	

Before we proceed to part c, it is important to note that in part c, variable cost per unit is not given. To calculate it we will use this formula:- **Variable cost per unit =  $\frac{\text{Change in total cost}}{\text{Change in units}}$**

Why?

Because if the cost is changed due to the change in the output, that change is due to variable cost only, as fixed cost remains fixed.

<b>Q7(c)</b>	Output	3,000 units	4,000 units
	Total Cost	12,000	14,000

Variable cost per unit = $\frac{\text{Change in total cost}}{\text{Change in units}}$	$= \frac{14,000 - 12,000}{4,000 - 3,000} = \frac{2,000}{1,000} = \text{Rs. 2}$
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Fixed cost = Total cost - Variable cost	$12,000 - (3,000 * 2) = 6,000$
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Break even Sales	$= FC + VC = 5,000 * 2 + 6,000 = 16,000$
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Break even Sales	$= \frac{\text{Fixed Cost}}{\text{P/V ratio}}$
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BES = 16,000	$16,000 = \frac{6,000}{\text{P/V ratio}}$
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P/V ratio	$= \frac{6,000}{16,000} * 100 = 37.50\%$
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**Q8:** VC per file Rs.40

Fixed cost: Rs 60000

Production capacity: 3000 Files; SP per file Rs.100

Compute

- a) BEP
- b) No of Files to be sold to earn a net profit of Rs.30000
- c) If the firm manufactures & sells 500 files more per yr. with an additional fixed cost of Rs.2000, What should be the selling price to earn the same amt of profit as in (b) above

**ANS: BEP: 1000 units; (b) 1500 files; (c) Rs.86**

**Q8**

SP	100
Less:VC	40
<b>Contribution</b>	<b>60</b>

Break even Point	$\frac{\text{Fixed Cost}}{\text{Contribution per unit}}$	$\frac{60000}{60} = 1,000 \text{ files}$
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Required Sales	$\frac{60,000+30,000}{60}$	$\frac{\text{Fixed Cost}+\text{Profit}}{\text{Contribution per unit}}$
		<b>=1,500 Files</b>

Sales = 1500+500=2,000 Files

Sales= VC + FC +Profit

Sales = 2,000\*40 + (60,000 + 2,000) + 30,000 =172,000

SP Per File=  $\frac{1,72,000}{2,000} = \text{Rs. } 86$

**Q9:** A retailer dealer in garments is currently selling 24,000 shirts P.a. Following are his details for yr. ended Dec 31, 2023

SP per shirt	40
VC per shirt	25
Fixed Cost:	
Salaries	1,20,000
General office cost	80,000
Advertising cost	40,000

Answer the following independently:

- (a) BEP & Marginal of Safety in Rs. & in Units
- (b) Assume that 20,000 shirts were sold in a year, what will be the profit
- (c) If it is decided to introduce a sales commission of Rs. 3 Per Shirt, how many shirts would require to be sold in a year to earn a net income of Rs.15,000
- (d) Assuming that for year 2007 an additional salary of Rs.33,000 is anticipated and price of shirt is likely to be increased by 15%, what should be the <sup>40</sup>BEP in units & Rs.

**ANS:(a) BES: 16,000, 640,000; MOS: 8,000, 320,000**

**(b) Rs. 60,000**

**(c) 21,250**

**(d) 13,000 or Rs. 5,98,000**



**Q9**  
**(a)**

SP	40
Less: VC	25
<b>Contribution</b>	<b>15</b>

$$\text{Break even Point} = \frac{\text{Fixed Cost}}{\text{Contribution per unit}} = \frac{240,000}{15} = 16,000 \text{ shirts}$$

$$\text{Break even Sales} = 16,000 \text{ units} * 40 \text{ (Selling price)} = \text{Rs. } 640,000$$

$$\begin{aligned} \text{Margin of safety} &= \text{Total Sales} - \text{Break even Sales} \\ &= 24,000 \text{ units} * 40 - 16,000 \text{ units} * 40 \text{ (Selling price)} = \text{Rs. } 320,000 \\ \text{In units} &= \frac{320,000}{40 \text{ (SP)}} = 8,000 \text{ shirts} \end{aligned}$$

**Q9**  
**(b)**

$$\begin{aligned} \text{Profit on 20,000 shirts} &:- \\ &= 20,000 \text{ units} * 15 \text{ (Contribution per unit)} - 240,000 \text{ (Fixed cost)} \\ &= 300,000 - 240,000 = \text{Rs. } 60,000 \end{aligned}$$

**Q9**  
**(c)**

Required Sales =  $\frac{\text{Fixed Cost} + \text{Profit}}{\text{Contribution per unit}}$

$$= \frac{240,000 + 15,000}{40 - (25 + 3)} = 21,250 \text{ shirts}$$

**Q9**  
**(d)**

Break even Point =  $\frac{\text{Fixed Cost}}{\text{Contribution per unit}}$

$$= \frac{240,000 + 33,000}{40 * 115\% - 25}$$

$$= \frac{240,000 + 33,000}{46 - 25}$$

$$= 13,000 \text{ shirts}$$

Break even Sales = 13,000 units \* 46 (Selling price) = Rs. 598,000

**Q10:-**

(1) When sales decline from Rs.900,000 to 700,000, profit of Rs 50,000 is converted into loss of Rs. 50,000. Determine contribution margin ratio.

(2) A co has a Fixed Cost of Rs.20,000. It sells 2 products-A&B, in the ratio of 2 units of A & 1 unit of B. Contribution is Rs 1 per unit of A & Rs.2 per unit of B. How many units of A & B would be sold at BEP

**ANS: A=10,000 & B=5,000 units**

**Note:-**

**1. Contribution margin ratio is also called as P/V ratio.**

**2. Profit of Rs 50,000 is converted into loss of Rs. 50,000, that means the change in profit is 100,000 as if Profit of Rs 50,000 is converted into Zero, change would be 50,000 but here it is 50,000 loss. So, the change is 100,000**

<b>Q10</b>	Sales	9,00,000	7,00,000
	Profit	50,000	-50,000

	<b>A</b>	<b>B</b>
Contribution per unit	1	2
<b>Composite contribution*</b>	2 units*1 + 1 unit*2	
* see the notes:-	<b>=Rs. 4</b>	

<b>P/V ratio=</b>	$\frac{\text{Change in profit}}{\text{Change in sales}} * 100$	$\frac{100,000}{2,00,000} * 100$
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<b>BEP</b>	$\frac{\text{Fixed cost}}{\text{Contribution per unit}}$	$= \frac{20,000}{4} = 5,000 \text{ units}$
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<b>BEP units wise</b>	A: 5,000 units * <b>2</b>	10,000 units
	B : 5,000 units * <b>1</b>	5,000 units

## NOTES FOR Q-10

1. Composite contribution is the contribution of a LOT size. Here the lot is 2 units of A and 1 unit of B as A and B are sold in the ratio of 2:1

2. For BEP unit wise:- we will multiply 2 units for A and 1 unit of B as the company sells A and B in the ratio of 2:1.

So, if 1000 units of B were sold then 2000 units of A would have been sold.