

## Foundations of Accounting & Finance

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Lecture – 32

### Decision Making using Cost Accounting Information - Examples - Part I

#### Example

Let us take one more example on decision making use of cost accounting information.

Gillett, Jimmy and Thomas (GJT) operate of a food truck. They sell made-to-order burritos, tacos, and burrito bowls for a set price of ₹10.25 per order. Each of their items (either one burrito, three tacos, or a burrito bowl) costs them, on average, ₹4.10 for the protein, rice, and veggies that customers choose. Their food truck expenses include licensing costs of ₹250 per year, insurance of ₹1,260 per year, and depreciation on the truck of ₹5,500 per year.

#### Required

- What is the break-even point in units (number of orders) for GJT?
- Calculate GJT's operating income for the year if it sells 2,000 orders this year.
- Calculate its operating income for the year if it sells 3,500 orders this year.
- If it does sell 3,500 orders this year, what is the margin of safety in both units and sales ₹s?

#### Solution

*a. What is the break-even point in units (number of orders) for GJT?*

To determine the break-even point, we first identify the fixed costs. The licensing cost amounts to approximately ₹250 per year, insurance is around ₹1,260 per year, and depreciation totals about ₹5,500 per year. Thus, the total fixed cost in this scenario is approximately ₹7,010.

Next, we examine the variable selling price. The selling price per order is ₹10.25, while the variable cost per order is ₹4.10.

Therefore, the contribution per order is  $₹10.25 - ₹4.10 = ₹6.15$ .

The breakeven point in terms of orders is calculated by dividing the total fixed cost by the contribution per unit. This yields the number of orders required to cover the fixed costs.

Rounding off, the breakeven point is approximately 1,140 orders.

The breakeven in terms of value represents the number of orders required to be sold multiplied by the price per order (₹10.25), resulting in the breakeven in terms of sales value (₹11,683).

Particulars	
<b>Fixed costs</b>	
licensing costs	250
insurance	1260.00
depreciation	5500.00
<b>Total fixed cost</b>	<b>7010.00</b>
Sales price	10.25
VC	4.10
Contribution	6.15
BEP in number of orders	1139.84
BEP in terms of value	11683.33

**b. Calculate GJT's operating income for the year if it sells 2,000 orders this year.**

Let us calculate GJT's operating income for the year assuming they sell 2,000 orders. They are projected to sell approximately 2,000 orders.

The contribution for 2,000 orders can be determined by multiplying the number of orders (2,000) by the contribution per unit (₹6.15). This results in a total contribution of ₹12,300 after covering the variable costs.

Since the fixed costs remain unchanged, the total fixed cost remains at the previously calculated ₹7,010.

To find the operating income, we subtract the fixed costs from the total contribution. Therefore, the profit of ₹5,290 is calculated as the contribution minus the fixed costs.

<b>Sales in number of orders</b>	<b>2000</b>
total contribution	12300.00
Less fixed cost	7010.00
<b>PROFIT</b>	<b>5290.00</b>

**c. Calculate its operating income for the year if it sells 3,500 orders this year.**

Now, let us consider the scenario where GJT sells 3,500 orders.

To find the total contribution, we need to multiply the number of orders (3,500) by the contribution per unit (₹6.15). This will give us the total contribution of ₹21,525.

Since the fixed costs remain unchanged, the total fixed cost remains the same as before ₹7,010.

To calculate the profit, we subtract the fixed costs from the total contribution. This will give us the operating income for the year if GJT sells 3,500 orders.

<b>Sales in number of orders</b>	<b>3500</b>
total contribution	21525.00
Less fixed cost	7010.00
<b>PROFIT</b>	<b>14515.00</b>

d. *If it does sell 3,500 orders this year, what is the margin of safety in both units and sales ₹s?*

Let us calculate the margin of safety. In terms of units, we compare the actual number of orders sold (3,500 units) with the breakeven point (1,140 units). Therefore, the margin of safety in units is  $3,500 - 1,140 = 2,360$  units.

In terms of sales ₹s, we multiply the margin of safety in units (2,360 units) by the selling price per order (₹10.25). This gives us the sales ₹s above the breakeven point.

<b>margin of safety in number of orders</b>	<b>2360</b>
<b>Value</b>	<b>24192</b>

e. *Calculate the degree of operating leverage*

Let us compute the degree of operating leverage in this scenario. The degree of operating leverage is calculated by dividing the contribution margin by the operating income.

If GJT sells 2,000 orders, the operating income would be ₹5,290.

Now, let us calculate the contribution margin. If 2,000 units are sold, and the contribution per unit is ₹6.25, then the contribution margin would be  $₹6.25 * 2,000 = ₹12,500$ .

Therefore, the degree of operating leverage is ₹12,500 (contribution margin) divided by ₹5,290 (operating income), resulting in approximately 2.36.

This means that for every percentage increase in sales, the operating income would increase by 2.36 times that percentage.

For instance, if there's a 20% increase in sales to 2,400 units, the operating income would increase by approximately 46.50%.

<b>Operating leverage at level of 3500 ordersale</b>	<b>21525.00</b>		
<b>operating income</b>	14515.00		
<b>OL</b>	<b>1.48</b>		
at level of sale of 2000	12300.00	sales @ 10%	2200
op income	5290.00		23.25%
<b>OL</b>	<b>2.33</b>	<b>contribution</b>	13530
		profit	6520.00
			7113.992

## Comprehensive example: Abacus India Ltd

Abacus India Ltd				
Income Statement for the Year Ended March 31, 2020				
Sales (90,000 units @ Rs. 5.00)				450,000
Cost of goods sold - Direct materials			180,000	
Direct Labour			90,000	
Factory overhead - Variables		18,000		
Fixed		80,000	98,000	368,000
Gross Margin				82,000
Selling Expenses				
Variable - Sales commission*	18,000			
Shipping	3,600	21,600		
Fixed - Advertising, Salaries, etc.		40,000	61,600	
Administrative Expenses - Variable		4,500		
Fixed		20,400	24,900	86,500
Net Loss				(4,500)

\* Commissions are based on sales revenue; all other variable expenses vary in terms of units sold.

Now, this company is currently operating and has incurred a loss of approximately ₹4,500. They are determined to recover from this loss and are exploring various alternatives, as outlined here.

They are considering six different cases, labelled as Case 1 through Case 6, in an attempt to find a solution. They are uncertain about the effectiveness of each alternative but are eager to determine which one will yield positive results. At this stage, they are seeking to resolve the situation and are presenting these alternatives for analysis.

Let us examine these alternatives and see if we can identify potential solutions to address their current difficulty.

### Case – 1 - Abacus

Now, let us go to **question number 1** in this particular case.

- The primary effort is to identify the level or per unit of contribution that Abacus derives to make any meaningful decision.
- Can we calculate the quantum of fixed & variable cost both per unit as well as total and the contribution?

Now, let us address question number 1 regarding Abacus. The primary objective is to determine the level or per unit contribution that Abacus generates to facilitate decision-making.

Firstly, we need to calculate both the fixed and variable costs per unit as well as their total, along with the contribution.

The number of units sold in this case is approximately 90,000 units @ 5.00 per unit.

Starting with the variable costs, we have:

- Direct material: ₹180,000 total, which translates to ₹2 per unit.
- Direct labour: ₹90,000 total, equating to ₹1 per unit.
- Variable factory overhead: ₹18,000 total, resulting in ₹0.20 per unit.
- Variable selling commission: ₹18,000 total, which is about ₹0.20 per unit or 4% of sales revenue.
- Variable shipping: ₹3,600 total, approximately ₹0.04 per unit.
- Variable administrative expenditure: ₹4,500 total, giving ₹0.05 per unit.

The total variable cost is calculated as ₹3.49 per unit.

Contribution per unit is the selling price (₹5) minus the total variable cost per unit (₹3.49), which is equal to ₹1.51 per unit.

Next, we consider the fixed costs, which include:

- Advertising and salaries: ₹40,000
- Factory fixed admin: ₹80,000
- Fixed factory overhead: ₹20,400

The total fixed cost amounts to ₹140,400.

To calculate profit, we subtract the total fixed cost from the total contribution.

Upon analysis, it appears there is a loss of ₹40,000.

Particulars	Question No. 1	
	Per unit	Total
units sold		90,000
Sales	5.00	4,50,000
<b>Variable expenses</b>		
direct materials	2.00	1,80,000
direct labor	1.00	90,000
variable factory overhead	0.20	18,000
variable sales commission* @ 4%	0.20	18,000
shipping cost	0.04	3,600
variable admin overhead	0.05	4,500
TOTAL VARIABLE Cost	3.49	314100
<b>Contribution per unit</b>	<b>1.51</b>	<b>135900</b>
<b>Fixed costs</b>		
<b>factory overhead</b>		80,000
advertising and salaries		40,000
for 2B increased adv cost		
admin fixed		20,400
TOTAL FIXED COST		1,40,400
<b>Profit or loss</b>		<b>-4,500</b>

### Case – 2 – Abacus

The sales manager of Abacus India Ltd is torn between two options to act on:

#### **Option -1 (2A)**

He has studied the market potential and believes that a 15% cut in price would fill the plant to capacity.

#### **Option -2 (2B)**

He wants to increase prices by 25%, to increase advertising by Rs.150,000, and to boost commissions to 10 per cent of sales. Under these circumstances, he thinks that unit volume will increase by 50 per cent.

What would be the new contribution and profit or loss under each alternative? Assume that there are no changes in fixed costs other than advertising.

### Option -1

The plant's capacity is 150,000 units per year, with the current production at 90,000 units. Implementing a 15% price reduction is anticipated to optimize plant capacity.

Under this option, the projected number of units sold would reach 150,000. With the new price set at 85% of the original price (₹5), it amounts to ₹4.25.

Despite the variable costs remaining constant, the contribution per unit decreases to ₹0.79. Consequently, the total contribution is ₹118,500.

Given that fixed costs remain unaltered, the profit or loss is computed by subtracting fixed costs from the total contribution. In this scenario, the outcome reveals a loss of approximately ₹21,900.

Hence, Option -1 (2A) leads to an amplified loss and is not a feasible remedy for enhancing the company's financial position.

Question No. 2 A		
Particulars		
units sold		1,50,000
Sales	4.25	
<b>Variable expenses</b>		
direct materials	2.00	
direct labor	1.00	
variable factory overhead	0.20	
variable sales commission* @ 4%	0.17	
shipping cost	0.04	
variable admin overhead	0.05	
TOTAL VARIABLE Cost	3.46	
<b>Contribution per unit</b>	<b>0.79</b>	<b>1,18,500</b>
<b>Fixed costs</b>		
<b>factory overhead</b>		
advertising and salaries		
for 2B increased adv cost		
admin fixed		
TOTAL FIXED COST		1,40,400
<b>Profit or loss</b>		<b>-21,900</b>

### Option -2

Let us explore Option -2: The plan is to increase prices by 25%, boost advertising expenditure by Rs.150,000, and raise commissions by 10% on sales, with an anticipated 50% increase in unit volume.

Under these conditions, the sales volume is expected to reach 150% of the base volume.

To calculate the sales commission, we consider the increased sales price, which is 25% higher than the original price of ₹5, resulting in ₹6.25. With a 10% commission rate, the commission per unit amounts to ₹0.63.

The total variable cost remains at ₹3.92 per unit. Thus, the contribution per unit is ₹6.25 - ₹3.92 = ₹2.34. Consequently, the total contribution is ₹315,225.

Fixed costs, including advertising and administrative expenses, remain unchanged, except for the increased advertising budget of ₹150,000.

Upon summing up the fixed costs, we find the total fixed cost to be ₹290,400.

Therefore, the profit under Option -2 is calculated as the total contribution minus the total fixed cost, resulting in a profit of ₹24,825.

	Question No. 2 B	
<b>Particulars</b>		
units sold		1,35,000
Sales	6.25	
<b>Variable expenses</b>		
direct materials	2.00	
direct labor	1.00	
variable factory overhead	0.20	
variable sales commission* @ 4%	0.63	
shipping cost	0.04	
variable admin overhead	0.05	
TOTAL VARIABLE Cost	3.92	
<b>Contribution per unit</b>	<b>2.34</b>	<b>3,15,225</b>
<b>Fixed costs</b>		
<b>factory overhead</b>		80,000
advertising and salaries		40,000
for 2B increased adv cost		1,50,000
admin fixed		20,400
TOTAL FIXED COST		2,90,400
<b>Profit or loss</b>		<b>24,825</b>