

Session 5 4th April 2019

Managerial Accounting & Control



A PRODUCT (OR ANY OTHER **COST OBJECT**) CAN BE SAYED TO BE **PROFITABLE** (ECONOMICALLY AFFORDABLE) WHEN.....

• It has a positive first contribution margin

 It creates volumes that cover any traceable fixed costs and offer a further contribution to covering common fixed costs (a positive second contribution margin)

The first law of profitability: the variable cost is the maximum limit of the sale price [Unit Price> Unit Variable Cost and then 1st CM> 0]

The second law of profitability: the 1st Contribution Margin must cover any traceable fixed costs [2nd MdC > 0]

The Profitability Laws

		HOTEL			RESTAURA	NT		SPORTS			TOTAL	
Revenues	€	3.822.000,00	100,00%	€	1.794.000,00	100,00%	€	394.000,00	100,00%	€	6.010.000,00	100,00%
Consumptions	€	146.000,00	3,82%	€	975.000,00	54,35%	€	36.000,00	9,14%	€	1.157.000,00	19,25%
Rentals	€	182.000,00	4,76%	€	76.000,00	4,24%	€	6.000,00	1,52%	€	264.000,00	4,39%
First Contribution Margin	€	3.494.000,00	91,42%	€	743.000,00	41,42%	€	352.000,00	89,34%	€	4.589.000,00	76,36%
Employees (annual)	€	1.710.000,00	44,74%	€	640.000,00	35,67%	€	80.000,00	20,30%	€	2.430.000,00	40,43%
Employees (seasonal)	€	720.000,00	18,84%	€	-	0,00%	€	72.000,00	18,27%	€	792.000,00	13,18%
External Services	€	24.000,00	0,63%	€	42.000,00	2,34%	€	4.000,00	1,02%	€	70.000,00	1,16%
Maintenance	€	165.000,00	4,32%	€	24.000,00	1,34%	€	38.000,00	9,64%	€	227.000,00	3,78%
Depreciations	€	155.000,00	4,06%	€	64.000,00	3,57%	€	88.000,00	22,34%	€	307.000,00	5,11%
Second Contribution Margin	€	720.000,00	18,84%	-€	27.000,00	-1,51%	€	70.000,00	17,77%	€	763.000,00	12,70%
Employees (annual)		€ 24	0.000	,00)	4,27%	€	-	0,00%	€	240.000,00	3,99%
Third Contribution Margin	€				453.000,00	8,07%	€	70.000,00	0,00%	€	523.000,00	1,09%

Bellavista Gourmet Hotel & Restaurant Case Study

The Profitability Laws

Unit sales price	4,00	3,00	2,00	1,25
Revenues	20.000,00	30.000,00	60.000,00	62.500,00
Variables Costs	4.350,00	7.900,00	21.300,00	32.500,00
First Contribution Margin	15.650,00	22.100,00	38.700,00	30.000,00
Traceable Fixed costs	33.000,00	33.000,00	33.000,00	33.000,00
Second Contribution Margin	- 17.350,00	- 10.900,00	5.700,00	- 3.000,00
Unit Variable Cost	0,87	0,79	0,71	0,65
First Contribution Margin per unit	3,13	2,21	1,29	0,60
Break-Even volume	10.543,13	14.932,13	25.581,40	55.000,00

Food Products for Childrens Case Study



Breakeven analysis examines the short run relationship between changes in volume and changes in total sales revenue, expenses and net profit

□ Also known as C-V-P analysis (Cost Volume Profit Analysis)

Break-even Analysis Defined

- Study of interrelationships among a firm's sales, costs, and operating profit at various levels of output
- Break-even point is the Q (Quantity or Volume) where Total Revenues = Total Costs (Q₁ to Q₂ on graph)



Linear Break-Even Analysis

Over small enough range of output levels TR and TC may be linear, assuming:
 Constant selling price
 Constant variable cost
 Firm produces only one product (no mix effect)
 No time lags between investment and resulting revenue stream



Graphic Solution Method

- Draw a line through origin with a slope of P (product price) to represent TR function
- Draw a line that intersects vertical axis at level of fixed cost and has a slope of MC
 Intersection of TC and TR is break-even point











Breakeven Chart - simulation



Breakeven Chart - simulation









Equate total revenue and total cost functions and solve for Q

 $TR = P \times Q$ $TC = FC + (VC \times Q)$ TR = TC $P \times Q_B = FC + VC \times Q_B$ $(P \times Q_B) - (VC \times Q_B) = FC$ $Q_{\rm R} (P - VC) = FC$ $Q_{R} = FC/(P - VC)$



Bannerman Trading Company opens a flower shop.

Fixed Costs:

- Rent: € 400
- Helper (Wages): € 200

Variable Costs:

• Flowers: € 0.50 per bunch

Selling Price:

• Flowers: € 2 per bunch

So we know that: Total Fixed Costs = $\in 600$ Variable Cost per Unit = $\in 0.50$ Selling Price per Unit = $\in 2.00$







 $SP = \notin 2.00$ $VC = \notin 0.50$ $FC = \notin 600$

We must firstly calculate how much income from each bunch of flowers can go towards covering the Fixed Costs.

This is called the **Unit Contribution Margin**

Selling Price – Unit Variable Costs = Unit Contribution Margin

€2.00 - €0.50 = €1.50

For every bunch of flowers sold € 1.50 can go towards covering Fixed Costs



Now to calculate how many units must be sold to cover Total Costs (FC + VC)

This is called the Break Even Point Break Even Point = Fixed Costs \div Unit Contribution Margin $\in 600 \div \in 1.50 = 400$ Units

Therefore 400 bunches of flowers must be sold to Break Even – at this the point the business is not making a Profit nor incurring a Loss – it is merely covering its Total Costs

Uses of Breakeven Analysis

- C-V-P analysis is an important tool in terms of short-term planning and decision making
- □ It looks at the relationship between costs, revenue, output levels and profit
- □ Short run decisions where C-V-P is used include choice of sales mix, pricing policy etc.

Decision Making and Break-Even Analysis: Exemples

□ How many units must be sold to breakeven?

- How many units must be sold to achieve a target profit?
- □ Should a special order be accepted?
- How will profits be affected if we introduce a new product or service?

Key Terminology: Break-even Analysis

- □ **Break even point:** the quantity (or volume) at which a company makes neither a profit or a loss.
- Contribution Margin per unit: the sales price minus the variable cost per unit. It measures the contribution made by each item of output to the fixed costs and profit of the organisation.

Key Terminology: Break-even Analysis

- Margin of safety: a measure in which the budgeted volume of sales is compared with the volume of sales required to break even.
 The margin of safety may be expressed in units or revenue terms and It shows the amount by which sales can drop before a loss will be incurred
- Marginal Cost : cost of producing one extra unit of output

Example: Margin of safety

Using the following data, calculate the breakeven point and margin of safety in units:

Selling Price = \in 50 Variable Cost = \in 40 Fixed Cost = \in 70,000 Budgeted Sales = 7,500 units

Solution

Contribution Margin = \in 50 - \in 40 = \in 10 per unit Breakeven point = \in 70,000/ \in 10 = 7,000 units Margin of safety = 7,500 - 7,000 = 500 units



Managerial Accounting & Control



□ What if a firm doesn't just want to breakeven – it requires a target profit

Contribution per unit will need to cover profit as well as fixed costs

□ Required profit is treated as an addition to Fixed Costs

Target profits (example)

Using the following data, calculate the level of sales required to generate a profit of $\in 10,000$: Selling Price = $\in 35$ Variable Cost = $\in 20$ Fixed Costs = $\in 50,000$

Unit Contribution Margin = €35 – €20 = €15 Level of sales required to generate profit of €10,000: $\underline{$ €50,000 + €10,000 €15

4000 units

Assumptions of Break Even Analysis (1)

- All fixed and variable costs can be easily identified over the whole range of output
- Variable costs are assumed to vary directly with output (Efficiency remains unchanged)
- □ Fixed costs will remain constant
- Selling prices are assumed to remain constant for all levels of output (no price promotional activities)

Assumptions of Break Even Analysis (2)

THERE ARE SOME COSTS THAT ARE DIFFICULT TO CLASSIFY: FOR THESE YOU MUST USE THE CONCEPT OF **RELEVANT LEVEL OF ACTIVITY**





Assumptions of Break Even Analysis (3)

- The sales mix of products will remain constant break even charts cannot handle multi-product situations
- It is assumed that all production will be sold (non inventory effect)
- The volume of activity is the only relevant factor which will affect costs

Limitations of Break-even analysis (1)

- □ Some costs cannot be identified as precisely Fixed or Variable
- Semi-variable costs cannot be easily accommodated in breakeven analysis
- ☐ Costs and revenues tend not to be constant
- With Fixed costs the assumption that they are constant over the whole range of output from zero to maximum capacity is unrealistic

Limitations of Break-even analysis (2)

- Price reduction may be necessary to protect sales in the face of increased competition
- The sales mix may change with changes in tastes and fashions
- □ Productivity may be affected by strikes and absenteeism
- The balance between Fixed and Variable costs may be altered by new technology