6 Break-even, profit and loss scenarios

Using cost behaviour for CVP analysis

In Chapter 5, we saw – by the practical analysis of costs into fixed and variable groups – how to transpose the Cherry Tree Restaurant departmental profit and loss statement into a marginal profit statement and determine the contribution margin towards fixed costs.

Now, as indicated in Figure 5.1 *Profit Planning Framework*, we can benefit immediately from the ripple effect of dropping a stone in the water – analysing cost behaviour – by applying CVP (cost-volume-profit) analysis techniques to enhance our routine, day-to-day, business decisions, beginning, in this chapter, with break-even, profit and loss scenarios.

CVP basic calculations: restaurant

To begin with we demonstrate a range of break-even, profit and loss scenarios to illustrate the practical application of CVP in basic scenarios.

In order to perform the calculations we will use the Cherry Tree Restaurant marginal profit statement presented in Figure 6.1.

	Total	Cover	
Number of covers sold	35,000		
	£	£	%
Sales revenue	420,000	12.00*	100
Less: Variable expenses	226,800	6.48†	54
Contribution margin (CM)	193,200	£5.52	46
Less: Fixed expenses	156,000		
Net profit before taxes	£37,200		

* Average spend per cover

† Average variable cost (marginal cost) per cover

Figure 6.1: Cherry Tree Restaurant: Marginal profit statement for the year

Note: The additional columns in Figure 6.1 showing the Contribution margin per cover £5.52 and the Contribution margin percentage 46% provide the information necessary to perform the CVP calculations.

Break-even sales volume

A business achieves break-even point when total revenues are equal to total costs. Although breakeven may not be an end objective in itself, it is an important intermediate point which must be reached prior to making a profit.

From Figure 6.1 we can see that, using the contribution margin percentage, each £1 of sales volume produces a contribution margin of £0.46 after recouping variable costs of £0.54. So what sales volume is required to recover fixed costs of £156,000?

$$\text{Breakeven sales volume} = \frac{\text{Fixed costs}}{\text{Contribution margin \%}}$$

$$= \frac{£156,000}{0.46}$$

$$= £339,130$$

Thus, the £339,130 break-even sales volume generates £156,000 worth of contribution margin (£339,130 × 0.46) which is sufficient to recover the fixed costs of £156,000, and thereafter each £1 of sales volume contributes £0.46 towards profit for the period.

We can also determine the break-even point in terms of the number of covers using the contribution margin per cover of £5.52 in Figure 6.1, as follows:

$$\text{Break-even (number of covers)} = \frac{£156,000}{£5.52}$$

$$= 28,261 \text{ covers}$$

Thus, 28,261 covers × £12 average spend = £339,132 break-even sales volume (discrepancy due to rounding).

Sales volume for a target profit

The same principle is applied here as for breakeven sales volume, in that, if each £1 of sales volume generates £0.46 after recouping variable costs, how much sales revenue is required to recover fixed costs of £156,000 and generate a profit of £37,200? The rule is to regard profit (or loss) as a fixed cost, as follows:

$$\text{Sales volume for target profit} = \frac{\text{Fixed costs + target profit}}{\text{Contribution margin \%}}$$

$$= \frac{£156,000 + £37,200}{0.46}$$

$$= £420,000$$

Referring back to Figure 6.1 we can confirm the £420,000 sales revenue appears in the summary marginal profit statement.

Again, we can also determine the number of covers required to achieve a target profit using contribution margin per cover, as follows:

$$\text{Number of covers for target profit} = \frac{£156{,}000 + £37{,}200}{£5.52}$$

$$= 35{,}000 \text{ covers}$$

Thus, 35,000 covers × £12 average spend = £420,000 sales volume required to recover the fixed and variable costs and achieve the £37,200 profit.

Sales volume to recover a loss

If we assume for a moment the Cherry Tree Restaurant had not made a profit of £37,200, but instead made a loss for the year of £(5,000), what additional sales volume would be required to recover the loss and, therefore, break-even? Treat the loss as a fixed cost, as follows:

$$\text{Sales volume to recover a loss} = \frac{\text{Loss}}{\text{Contribution margin \%}}$$

$$= \frac{£(5{,}000)}{0.46}$$

$$= £10{,}870$$

In effect, losses represent the costs not recouped by the contribution margin generated from sales volume. In this case, £10,870 extra sales revenue is required to provide a contribution margin of £5,000 (£10,870 × £.46) to recover the £(5,000) loss (un-recouped costs).

Again, we can also determine the number of covers required to recover the loss using contribution margin per cover, as follows:

$$\text{Number of covers to recover a loss} = \frac{£(5{,}000)}{£5.52}$$

$$= 906 \text{ covers}$$

Thus, 906 covers × £12 average spend = £10,872 sales volume required to recover the loss and break-even (discrepancy due to rounding).

Note: The term 'sales volume' generally refers to the sales revenue generated from the number (volume) of units sold, such as the physical number of customers served and/or the number of products and/or services sold.

Note: Measures, such as break-even number of covers, visitors and occupancy levels translate financial targets into an operational context – an important aspect for managers - to determine the actual volumes of products and services required to be produced and sold to achieve the targets.